

SUICIDAL BEHAVIOUR IN CHILDBEARING WOMEN

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Louis Appleby.

ABSTRACT

The first postnatal year is a period when the rate of psychiatric disorder is high, and a correspondingly high rate of suicide might be expected. Age-adjusted mortality ratios for suicide by women in the first postnatal year were therefore calculated from population data for England and Wales for a twelve-year period. The overall mortality ratio was found to be 17 - that is, the actual total was one sixth of that expected. The low rate was not found after stillbirth which was associated with a rate of suicide six times that in all women after childbirth. Women who committed suicide after childbirth most often did so in the first postnatal month and there was a tendency to use violent methods. One explanation of the low rate of suicide is that motherhood exerts a protective effect, and further studies were carried out to explore this possibility. In study two, the age-standardised mortality ratio for suicide during pregnancy was calculated by the same method to be 5 - that is, the actual rate was one twentieth of that expected. In study three, the rate of parasuicide by women in the first postnatal year was calculated from catchment area data to be less than half that of age-matched women (odds ratio 0.43). In study four, a cognitive explanation for these results was studied. Women with postnatal depression were found to score less on a questionnaire measuring cognitions related

to worthlessness, hopelessness and self-harm than women with depression arising at other times. This result suggests that childbearing women, despite their risk of psychiatric disorder, are protected against suicide and self-harm by their relative absence of suicide-related cognitions, and that such cognitions should be a focus for the treatment of other groups at risk of suicide.

Chapter 1 is a review of the research literature on postnatal psychiatric disorders with emphasis on their aspects, such as rates and features of postnatal psychosis and postnatal depression, that are of most relevance to the subsequent experimental work. Similarly, Chapter 2 is a review of the relevant literature on suicide and self-harm, in particular the relationship between suicide and psychiatric disorders, and suicide and depression. Chapter 3 reviews the literature on suicidal ideation and suicidal behaviour in childbearing women, including the review of research in this field.

Chapters 4 to 7 constitute the experimental sections of the thesis. Each describes a separate research study in a sequence of four studies. The main study, on suicide in the first postnatal year, is described in Chapter 4, and Chapters 5 and 6 extend the findings through research on

INTRODUCTION

This thesis examines the rate and characteristics of suicide and self-harming behaviour in childbearing women. It therefore brings together research from two areas of psychiatry, namely psychiatric disorders associated with childbirth, and suicide and self-harm.

Chapter 1 is a review of the research literature on postnatal psychiatric disorders with emphasis on those aspects, such as rates and features of postpartum psychosis and postnatal depression, that are of most relevance to the subsequent experimental work. Similarly, Chapter 2 is a review of the relevant research literature on suicide and self-harm, in particular the relationship between suicide and psychiatric disorder, and suicide and sex, age, marital status and parenthood. Chapter 3 reviews in detail the limited literature on suicide and parasuicide in childbearing women, indicating key omissions of previous research in this field.

Chapters 4 to 7 constitute the experimental section of the thesis. Each describes a separate research study in a sequence of four studies. The main study, on suicide in the first postnatal year, is described in Chapter 4, and Chapters 5 and 6 extend its findings through research on

pregnant suicides and postnatal parasuicides. Chapter 7 describes a study designed to test a possible explanation for the findings in Studies 1 to 3, i.e. that women with postnatal depression are cognitively distinct from women with depression at other times. Each of the studies is therefore based on the findings of the previous chapter, and at the end of each chapter a brief summary and comment is given, so that the rationale for the work described in the next chapter can be easily understood.

Chapter 8 discusses the principal findings of all four studies in more detail and ends with the implications for future clinical practice and research in both postnatal psychiatric disorders and suicide prevention. The Appendix contains the Edinburgh Postnatal Depression Scale (Cox et al. 1987) and the Revised Clinical Interview Schedule (Lewis et al. 1992), both of which are used in the assessment of mood in study 4, and the "coping styles questionnaire", described in study 4 and used to study cognitions in postnatal and non-postnatal depression. This questionnaire has not been used in any previously published research; its reliability and validity are discussed in Chapter 8.

Most of the main findings of Studies 1 and 2 have been published previously (Appleby 1991) and this publication is included in the Appendix; full details of these studies are

given here. The main findings of Study 3 are contained in a paper that is in press at the time of submission of this thesis (Appleby & Turnbull, in press). The work described in Study 4 is being prepared for publication.

CHAPTER III

MENTAL PSYCHIATRIC SERVICES

1.1 INTRODUCTION

1.1.1 Scope of this chapter

Several postpartum disorders have been recognized for centuries, and several more are being described today when required (1985) and others (1987) described their clinical features. This review is not intended as a

CHAPTER ONE

POSTNATAL PSYCHIATRIC DISORDERS

1.1.1 Definition

Psychiatric disorders in women who have recently given birth are collectively classified into two groups, the postpartum (or perinatal) psychosis and the postpartum depression. The former is characterized by acute onset and is usually severe, and the latter is characterized by a more gradual onset and is usually less severe. The clinical picture of the postpartum psychosis is that of a primary psychotic disorder.

For example, the clinical picture of the postpartum psychosis is that of a primary psychotic disorder.

1.1 INTRODUCTION

1.1.1 Scope of this chapter

Severe postpartum disorders have been recognised for centuries, and studied since the mid-nineteenth century when Esquirol (1845) and Marce (1858) described their clinical features. This review is not intended as a comprehensive account of research on every aspect of postpartum disorders. It is a summary of key findings with emphasis on those that are relevant to the experimental work of this thesis. Suicidal behaviour in childbearing women is not covered in this chapter but in Chapter 3.

1.1.2 Definitions

Psychiatric disorders in women who have recently given birth are conventionally classified into three categories: postpartum (or puerperal) psychosis, postnatal depression and maternity blues. However, these are descriptive terms, and no universally agreed definitions have emerged from clinical practice or the research literature.

For example, both the principal modern systems of classification, the International Classification of

Diseases, 10th Revision (ICD-10) (W.H.O. 1992), and the Diagnostic and Statistical Manual, 4th Revision (DSM-IV) (A.P.A. 1994) discourage the diagnosis of postpartum psychosis. Instead, such illnesses are intended to be diagnosed according to their clinical appearance, e.g. as bipolar disorder, and the fact that they have arisen postnatally may be recorded on a separate diagnostic axis specifying aetiology.

In clinical practice and research, however, the term is widely used, though in two distinct ways. It can refer to women who develop delusions or hallucinations postnatally, or it can be applied to women who suffer illnesses severe enough to lead to hospital admission.

The first definition has the advantage of being based on clinical phenomena, and is therefore consistent in principle with modern diagnostic systems which are based on clinical or operational criteria, such as those of DSM-IV (A.P.A. 1994) and ICD-10 (W.H.O. 1992). However, it has the disadvantage of excluding some women with severe postpartum illness, such as cases of profound depression or hypomania in which delusions and hallucinations do not appear, or cases in whom these phenomena are not evident, in doubt, or - in the case of retrospective studies - not clearly recorded.

The second definition has the advantage to researchers of being based on something highly reliable - admission to hospital. It also encompasses a group of women with severe illness regardless of the precise clinical phenomena. However, there are disadvantages in any definition of illness based on how services respond to it. Many factors, social as well as clinical, determine whether or not someone with a psychiatric disorder is admitted to hospital. Thus the degree of overt disturbance, the presence of suicidal thoughts, difficulties in coping with child care, the amount of family support, or the proximity of the nearest hospital may all be key determinants of whether admission takes place. As a result, any study population based on this definition is likely to be more heterogeneous than one based on symptoms alone. In one of the key epidemiological studies in the field, Kendell et al. (1987) resolved this issue by first examining all hospital admissions and then studying those with psychotic illness.

In defining postpartum psychosis, there must also be a clear definition of the postpartum period. Dean and Kendell (1981) and Brockington et al (1981) have shown that many cases of postpartum psychosis begin in the first 2 weeks after delivery, suggesting that a short time limit should be part of any definition. On the other hand, Kendell et al (1987) have shown that the increased risk of

psychiatric admission after childbirth continues for at least two years after delivery.

In clinical practice, some Mother and Baby Units allow joint admission of mothers and infants up to one year after the birth, with the result that studies based on such admissions may in effect define the postpartum period as the first year of infant life. Increasingly, such units are asked to admit non-acute cases for assessment of maternal parenting, with the effect that any study sample taken from Mother and Baby Unit admissions will include people with chronic psychiatric and behavioural disorders (Dean and Kendell 1981; Meltzer and Kumar 1985; Appleby & Dickens 1993).

In postnatal depression the same inconsistencies in defining the clinical syndrome and the postnatal period also arise. Usually the term refers to non-psychotic depression, i.e. clinically significant depression in the absence of delusions and hallucinations. However, some of the symptoms that are used to diagnose depression in general, e.g. sleep disturbance and fatigue, may be found in many non-depressed women who are looking after newborn infants. In research and clinical practice, therefore, a judgment must often be made as to how understandable such symptoms are when a woman's experience of baby care is taken into account. Conversely, there may be features of

depression that are particularly associated with postnatal depression, such as a feeling of not coping.

In many research studies, one solution to this problem of definition has been to use assessment methods that have been designed for and/or validated on women with postnatal depression. A number of instruments used in psychiatric research in general have been employed in studies of postnatal disorders.

The most widely used is that devised by Cox et al. (1987), the Edinburgh Postnatal Depression Scale (EPDS), a 10-item questionnaire whose items are derived in part from the Hospital Anxiety and Depression Scale (HAD) (Zigmond & Snaith 1983). The latter instrument was designed to assess neurotic symptoms in hospital populations; it concentrates on identifying symptoms that most clearly reflect psychiatric morbidity rather than those, e.g. somatic symptoms, which could have a physical or psychological origin. The EPDS similarly focuses on symptoms that are likely to reflect depression in postnatal women.

As with postpartum psychosis, studies of postnatal depression have had to incorporate a definition of the postnatal period into their design. Most have studied women who have been found to be depressed between 6 weeks and 6 months following delivery, while acknowledging that

many depressions in women with young babies may be missed.

Furthermore, there is the question of incidence versus prevalence of depressive illness. The description of postnatal depression given by Pitt (1968) included the point that cases should have begun after delivery. Many studies, however, recruit cases of postnatal depression by detecting them postnatally - their populations are therefore likely to be made up of any women found to be depressed at a defined postnatal point. Some, however, have employed a prospective design and have been able to identify new cases of depression (e.g. Kumar & Robson 1984).

It is clear from these differences of definition that different studies will have examined different patient populations. This must be borne in mind when their findings on rates, risk factors and clinical features are compared in the discussion below.

1.2. POSTPARTUM PSYCHOSIS

1.2.1. Clinical features

The clinical features of postpartum psychosis are varied, partly because there is no single definition and partly because the term, even when a restricted definition is used, encompasses more than one clinical syndrome.

Many cases, however, can be described as major affective illnesses of acute onset within the first few weeks after childbirth (Meltzer & Kumar 1985). The features may be predominantly manic, with elation or irritability, disinhibition, overactivity, and grandiosity (Brockington et al. 1981). Alternatively, they may be predominantly depressive, with low mood, agitation or stupor, social withdrawal, guilt and self-criticism. In both manic and depressive presentations there may be delusions and hallucinations and these are likely to be mood-congruent; depressive delusions are more common than in non-puerperal cases (Dean and Kendell 1981).

However, there are a number of variations on this basic pattern. Some postpartum illnesses show symptoms associated with schizophrenia rather than with pure affective disorder, such as passivity experiences and

disorders of thought form, and are closer to schizo-affective disorders than any other ICD or DSM diagnosis (Brockington et al. 1981; Meltzer and Kumar 1985). Others show evidence of both mania or hypomania and depression in the same episode, frequently beginning with a brief period of elation that is followed by a profound depression.

When Research Diagnostic Criteria (RDC) (Spitzer et al 1978) have been applied to case series, therefore, the most frequent diagnoses have been affective and schizo-affective, with depressive and schizo-depressive disorders being more common than manic (or hypomanic) and schizo-manic disorders (Meltzer & Kumar 1985; Brockington et al. 1981; Kendell et al. 1987). Relatively few cases of schizophrenia, diagnosed according to RDC, appear in these series. It is possible that some schizophrenic patients have schizo-affective illnesses when they relapse in the postpartum period and are therefore classified as schizo-affective on RDC. However, Kendell et al. (1987) have calculated that relapses occur in only 3.4% of puerperal women with a history of schizophrenia, concluding that there is no relationship between postpartum psychosis and schizophrenia. These authors take the view that postpartum psychosis is a form of major affective disorder.

In some cases there is little evidence of either mood disorder or schizophrenic symptoms; in these patients the

clinical picture is one of disturbed behaviour and perplexity. When RDC are applied to this group, the closest category is that of "unspecified functional psychosis", a diagnosis that accounts for a significant minority of patients in published case series (Meltzer & Kumar 1985; Kendell et al. 1987).

Even in the presence of clear affective disorder, the clinical picture may include perplexity, apparent confusion and lability (Dean and Kendell 1981; Brockington et al. 1981), features that have been remarked upon since the earliest descriptions (Marce 1858). It is these features that have led some authorities to take the view that postpartum psychosis is distinct in appearance from other psychoses (Hamilton 1982), and there is some experimental evidence to support this view, in that authorities in the field have been able to distinguish postpartum from other cases from videotaped mental states (Brockington et al. 1982). Whether these distinguishing features are specific to postpartum psychosis, or occur in other acute psychoses of rapid onset has not been tested.

1.2.2. Timing of onset

Kendell et al. (1987) have shown that increased rates of psychiatric admission occur for as long as two years after

childbirth. Nevertheless, they found a large clustering of admissions in the first 3 postnatal months (relative risk 3.8), particularly in the first thirty days when the rate of admission was six times the mean rate of the months before pregnancy, and the relative risk of admission with psychosis was 21.7. Of 120 postnatal cases, 54 were thought to have begun in the first postnatal week, while 66 had begun in the first two weeks.

Similarly, in most of the cases described by Brockington et al. (1981) and Meltzer and Kumar (1985) the onset was within the first two weeks postnatally and admission took place within the first postnatal month. In the cases described by Paffenbarger (1964), 34% began within the first week postnatally and 68% within the first month.

1.2.3. Epidemiology

Several studies have attempted to calculate the incidence of postpartum psychosis (Pugh et al. 1963; Paffenbarger 1964; Kendell et al. 1976; Kendell et al. 1981a; Kendell et al. 1987), most using hospital admission as an indication of severe mental illness. The results have been remarkably similar, leading to a consensus that the incidence of psychosis in the early postpartum period is approximately 2 per 1000 births, or 0.2%.

Pugh et al. (1963), studying a sample of admissions of women aged 15 - 44 years to psychiatric hospital in Massachusetts in 1950, found a large excess of admissions with psychosis during the first three months following delivery, and a smaller excess for other disorders. The increase in psychosis continued up to nine months postnatally. Paffenbarger (1964) conducted a similar study in Hamilton County, Ohio, examining the medical records of all women aged 15 - 44 admitted to psychiatric hospital between 1940 and 1958, and recording those who were noted to have given birth within the previous six months. He found 242 cases whose onset was postnatal, a rate of 19 per 10,000 births.

More recently, Kendell et al. (1976; 1981a; 1987) conducted a series of studies matching lists of women who had given birth with psychiatric case registers, first in Camberwell and later, using a computer linkage between case registers, in Edinburgh over first seven, and later eleven years. The Camberwell study (Kendell et al. 1976) found a large excess of psychiatric contacts, especially new episodes of functional psychosis, in the first three months after delivery, compared to all other three month periods in the two years before and two years after delivery. In the larger Edinburgh study (Kendell et al. 1987), the result, based on admissions, was similar. In the first ninety postnatal days the rate of hospital admission was 2.2 per

1000 births. The precise relative risk associated with childbirth depended on whether the calculation was based on primiparous or all women, admissions with psychosis or all admissions, and the period of time studied. When all women admitted with any diagnosis in the the first two years postpartum were studied, the relative risk was 1.6. However, when the calculation was confined to primiparous women admitted with psychosis within one month of delivery, the relative risk was 35.

1.2.4 Aetiological factors

Genetic Several studies have found the rate of psychiatric disorder in the families of women with postpartum psychosis to be high, and the main disorders in such families appear to be major affective disorders (Dean et al. 1989).

Whalley et al. (1982) found an excess of manic-depressive psychosis in the first degree relatives of patients with postpartum psychosis but no increase in their rate of postpartum psychosis itself. Dean et al. (1989), however, found an excess of postpartum psychosis in the families of cases compared to the general population but no excess compared to the families of women with manic depressive psychosis. These authors concluded that there was no evidence that postpartum psychosis is a genetically

distinct condition.

Platz and Kendell (1988), in a nine-year follow-up of women admitted to hospital within ninety days of childbirth and a matched, non-puerperal comparison group, found fewer episodes of illness in the postpartum group and concluded that the latter had a lesser genetic predisposition to affective disorder.

Biochemical The assumption that biochemical factors play a part in causing postpartum psychosis is based on several observations and lines of enquiry. Firstly, the onset of psychotic illness soon after delivery suggests a specific relationship to the event of childbirth. Secondly, it is generally believed that hormone changes, such as falls in sex steroid levels, contribute to the mood disturbance found in some menopausal women, premenstrual syndrome, and, most significantly, maternity blues. Thirdly, there is evidence from animal work that sex steroids can alter behaviour. Fourthly, biochemical models (e.g. in platelets) show that hormones such as oestrogens may affect activity in neurotransmitter systems - such as those of serotonin, noradrenaline and dopamine - thought to underpin mood and psychosis.

In general, however, the results of studies designed to identify the biochemical basis of postpartum psychosis have

been disappointing. There are a number of likely reasons for this, relating to the models of the disorder used in most research. Firstly, a clinical condition such as maternity blues, used in some studies to exemplify the relationship between mood and endocrine changes (e.g. Nott et al. 1976) may be a poor model of the much more uncommon and florid psychotic illnesses. Secondly, animal behavioural models may likewise be inaccurate representations of human psychosis. Thirdly, research on single transmitter systems *in vitro* may not reflect the complexity of *in vivo* physiology in which it is likely to be the balance and interaction of different neurotransmitters, often regulated by competing and interacting hormones, that determines mood and behaviour. Fourthly, postpartum psychosis is uncommon and large numbers of subjects would be required in a prospective biological study of the determinants of illness.

Some of these methodological problems can be solved by recruiting a study sample of women at high risk of postpartum psychosis (Kumar et al. 1983). Wieck et al. (1991) have prospectively investigated a group of such "at risk" women, i.e. women who have previously had postpartum psychotic illness or bipolar disorder. These authors have found relapse to be related to the sensitivity of dopamine receptors.

Psychosocial Few studies of the incidence of postpartum psychosis have been large enough to examine risk factors other than childbirth. Kendell et al. (1987), however, in their case register linkage study, were able to study the effects of putative social and obstetric risk factors. The most striking risk factor was primiparity: the risk of psychotic illness within thirty days of first childbirth was thirty-five times higher than before pregnancy. This may reflect the psychological stress of the first experience of childbirth, or the avoidance of future pregnancies by "at risk" women. Brockington et al. (1982) have also pointed out that, because pre-eclampsia - a condition obviously caused by biological factors - is also more common in primiparous women, it cannot be assumed that the association with first pregnancy is evidence of psychosocial aetiological factors.

1.2.3. Treatment and prognosis

Kendell et al. (1987) found that perinatal death, being unmarried and delivery by Caesarian section were also related to postpartum admission, whereas in the earlier Camberwell study (Kendell et al. 1976), being unmarried was associated with admission over the whole 4-year study period, and there was no evidence of increased risk from perinatal death. Paffenbarger's (1964) study reported on similar risk factors, finding an association with dystocia, "stormy pregnancies", low birth weight, perinatal mortality, and low parity, but no association with marital

status. More recently, Marks et al. (1992) have shown that high expressed emotion in male partners during late pregnancy is associated with postpartum relapse.

In summary, postpartum psychosis appears to be closely related to manic depressive psychosis or bipolar disorder (the term preferred in DSM and ICD 10). The clinical features are similar, the conditions occur in the same individuals, and in the same families. The most economical explanation of the link between the two syndromes is that postpartum psychosis is an acute major affective disorder precipitated in genetically predisposed women under the powerful influence of the biological changes of childbirth, particularly the circulating levels of sex steroids.

1.2.5 Treatment and prevention

There have been no treatment trials specifically directed at determining the optimum treatment of postpartum psychosis, and most clinicians follow the same treatment principles that they apply to acute non-puerperal cases. Neuroleptic drugs are used to treat psychotic symptoms, agitation and mania. Antidepressants are used for depressive illness; mood stabilising drugs such as lithium and carbamazepine are also used.

Some clinicians believe that electro-convulsive therapy (ECT) may be a particularly effective in postpartum cases, and Protheroe (1969) suggested that the better prognosis of postpartum psychosis in the second half of this century might be attributable to ECT. However, although ECT remains in regular use in postpartum psychosis, there is no research evidence that its benefit is greater than in non-puerperal disorders.

Similarly, there is little evidence on how relapse can be prevented specifically in postpartum psychosis. There is one uncontrolled case series of the use of lithium in 20 women at high risk of relapse which reported only one failure of prophylaxis. As the likely rate of relapse in such cases is around 20% (Protheroe 1969) and may be as high as 50% (Wieck et al 1991), this appears to represent a successful intervention. In one case, however - a woman who had been prescribed lithium before delivery - the baby was stillborn. Although it can not be concluded that lithium raises the risk of stillbirth, many clinicians begin preventive treatments, including lithium, after delivery if possible.

There is a similar lack of evidence that any one treatment setting is more therapeutic than others. In many parts of the United Kingdom it is possible for a woman to be admitted to hospital with her baby (Prettyman & Friedman

1991), although day hospital (Cox et al. 1993) and community services (Oates 1988) have also been established with apparent success.

1.2.6 Outcome

Outcome studies have focused on the likelihood of puerperal and non-puerperal relapse after recovery from an index episode. Most have shown that the risk of illness following the subsequent pregnancies is increased to 20 - 40% (Protheroe 1969; Davidson & Robertson 1985; Platz & Kendell 1988). In high risk cases, the relapse appears to be almost 50% (Wieck et al 1991). The rate of non-puerperal relapse has been estimated to be around 40% (Protheroe 1969; Reich & Winokur 1970).

As most cases are affective disorders, the same pattern of good clinical recovery between episodes is found, although when the acute illness takes the form of schizophrenia the prognosis is similarly worse (Da Silva & Johnstone 1981; Davidson & Robertson 1985).

1.2.7. Complications

In such severe, acute onset psychotic illnesses there is

clearly the potential for complications such as infanticide and suicide. There is little research on direct harm to babies from mothers with psychotic illness, although in d'Orban's series of women who had killed their children only a minority were psychotic, and it was not clear how many of these were cases of postpartum psychosis (d'Orban 1979). Few published studies have examined the effect of severe postpartum disorders on infant development, and their results have been conflicting. Although Naslund et al. (1984) and McNeil et al. (1988) reported no detrimental effects on attachment and development, Kumar and Hipwell (1994) described more insecure attachment and less maternal sensitivity at one year follow-up in cases of severe postpartum depression compared to cases of postpartum mania. Schizophrenic mothers admitted to a Mother and Baby Unit were also separated from their infants at discharge in 50% of cases, because of concerns over parenting capability (Kumar & Hipwell 1994).

The subject of suicide is considered in Chapter 3.

1.3 POSTNATAL DEPRESSION

1.3.1 Clinical features

One of the first modern clinical descriptions of non-psychotic depressive illness in the postnatal period was that of Pitt who entitled his study "Atypical depression following childbirth" (Pitt 1968). In Pitt's view, postnatal depression was atypical because it was characterised by prominent anxiety. Since his influential work, however, most authorities have seen postnatal depression as symptomatically typical of depressive illness found in primary care.

The clinical features of postnatal depression are therefore those of low mood, anxiety, tearfulness, irritability and a feeling of not coping with motherhood. Fatigue and insomnia occur out of proportion to what can be directly attributed to baby care. Patients often describe becoming preoccupied with baby care, feeling that they are not performing it adequately but that to accept help would be an admission of failure. Some are unsupported by family members and partners, and marital discord can also result.

The timing of onset of depression after childbirth is more varied and generally later than that of postpartum

psychosis. Most cases appear to begin in the first few postnatal months, although new cases continue to occur after this (Kumar and Robson 1984). As discussed above, different definitions of the postnatal period have been used in research.

1.3.2. Incidence and prevalence

Most of the studies that have estimated the rate of depression in the postnatal period have reported a figure of 10-15%, in keeping with Pitt's (1968) finding. This consistency has occurred despite the fact that studies have used different methods of measuring mood, defined the postnatal period differently, investigated different populations, and estimated either prevalence or incidence. Few have used a satisfactory control sample.

Kumar & Robson (1984), for example, using a prospective design, found a prevalence of depression and anxiety of 14.9% - seventeen cases in 114 women - in women who were three months post-delivery. This figure comprised fifteen new cases of depression, one new case of anxiety, and one "old" case of depression, and if the last two are excluded, an incidence of depression of 13.2% is found. No comparison was made with any control sample but the prospective design allowed the women to be their own

controls.

Watson et al. (1984) also employed a prospective design and found that 12% of their sample were depressed at six weeks. Of twenty-nine cases of depression in 128 childbearing women, twelve had been depressed during pregnancy. These authors commented that their one-year prevalence figure of 17% was similar to what has been reported in non-postnatal women.

Cox et al. (1982) reported a rate of 13% at four months postpartum, and commented that many more women had depressive symptoms. Cox (1983) also found a similar figure - 10% - in Ugandan women three months after delivery. O'Hara et al. (1984) reported that 12% of their sample of ninety-nine women became depressed postnatally.

However, there have been exceptions to this widely quoted figure. Cooper et al. (1988) reported a slightly lower rate of 8.7% at three months postpartum. Cutrona (1983) similarly reported a rate of 8.2% at eight weeks after delivery. Paykel et al. (1980), on the other hand, found a prevalence of 20% at six weeks postnatally, while Ballard et al. (1994) found 27.5% of their sample to be depressed at six weeks.

Cooper et al. (1988) compared their relatively low figure

to an estimate of depression in the female population as a whole, finding that the two did not differ significantly. However, the comparison population was studied at a different time in a different city, and can not be regarded as an entirely satisfactory control. O'Hara et al. (1984) derived a more comparable control group by studying the non-postnatal friends of their cases. The two groups did not differ in rates of depression.

These studies raise the possibility that depression in postnatal women is no more common than in other women. Cox et al. (1993), however, appear to have reconciled the discrepancies. Their study found a point prevalence of 9.1% for depression at six months postnatally, a figure no higher than that of a control sample. Nevertheless, when both groups were asked to date the onset of their depression, the postnatal group showed a three-fold increase in new cases in the five weeks after delivery, compared to the equivalent period in the controls.

This study could itself be criticised for not establishing time of onset more clearly with a prospective design. However, it suggests that new cases of depression are more common in the first few weeks postnatally but that over a longer period of time, the difference from the female population as a whole disappears.

1.3.3. Aetiology

A large number of risk factors have been associated with postnatal depression. Most studies suggest that psychosocial factors are the most important, in contrast to what has been found in postpartum psychosis. However, many of the findings are contradictory, perhaps reflecting different definitions of postnatal depression and, in some studies, relatively small samples. A summary of risk factors is given below, with emphasis placed on the most consistent findings and the results of well-conducted, preferably prospective studies with adequate sample sizes.

Biological A number of studies have examined whether women with postnatal depression are likely to have a family history of depression (though not specifically postnatal depression). The results have been mixed, Kumar and Robson (1984) finding no link, O'Hara et al. (1984) finding that a family history contributed slightly to the risk, and Watson et al. (1984) finding this to be a risk factor. It is more clear, however, that a personal history of psychiatric disorder, including postnatal depression, increases risk (Paykel et al. 1980; O'Hara et al. 1984), and this may reflect a biological vulnerability.

The evidence for a hormonal cause is also varied, with most well-conducted studies finding an absence of associations

with hormone levels. However, Harris et al. (1992) have reported a relationship with thyroid dysfunction and Kelly and Deakin (1992) have found lower oestradiol levels at one month postpartum in women who were depressed.

Psychosocial The most consistent findings from the several studies on psychosocial correlates of postnatal depression are emotional disturbance during pregnancy, anxious personality, marital dysharmony, and poor social support (Kumar & Robson 1984; Watson et al. 1984; O'Hara et al. 1984). Paykel et al. (1980) found that poor marital support was a vulnerability factor, increasing the impact of life events, which were in themselves strongly associated with postnatal depression.

Although no study has found that social class *per se* is related to postnatal depression, many of the findings reflect an association with social and economic adversity, e.g. poor housing, young maternal age, low income (Paykel et al. 1980; Playfair & Gowers 1981).

Most obstetric risk factors probably exert their effect (O'Hara et al. 1984) by being stressful life events. The most consistently reported are obstetric complications in general, Caesarian section specifically, and unplanned pregnancy. Similarly, Kumar and Robson (1984) reported an association with thoughts of terminating the pregnancy.

These varied results may suggest that postnatal depression is a heterogeneous condition. Consequently, when key risk factors were used antenatally to predict depression arising postnatally, the result was disappointing (Appleby et al. 1994). However, one factor alone - a history of depression - identified a group with a 30% chance of scoring highly on the EPDS after delivery.

1.3.4. Treatment and prevention

Only two controlled treatment trials in postnatal depression have been published, both showing benefits. Holden et al. (1989) used non-directive counselling delivered by health visitors to treat a sample of depressed mothers and compared them to a control sample who received no specific intervention. The result showed the value of this simple form of psychotherapy: a response rate of 69% in the treatment group compared to 38% in the controls.

In contrast, Henderson et al. (1991) gave their subjects oestrogens by transdermal patch in a randomised, double-blind, controlled trial. The treatment group was significantly more improved after two months of treatment but both groups had improved considerably and equally by four months.

One further study should be mentioned although the results are not yet published. Cooper and Murray (1994) have compared counselling with cognitive and interpersonal psychotherapies and found equivalent improvement in mood in all three groups.

Similarly, there is a scarcity of published studies of prevention. However, Leverton and Elliot (1989) have described an antenatal intervention - mainly classes on parenthood - given to high-risk women. The rate of postnatal depression in the treatment group was 19% compared to 40% in controls.

1.3.5. Outcome and complications

The outcome of postnatal depression is varied. The above studies suggest that, even in the absence of treatment, the majority of cases, around 70%, recover (Cooper & Murray 1994). However, for others, the postnatal episode can be the beginning of a period of chronic or relapsing depression that can continue for at least four years (Kumar and Robson 1984; Nott 1987).

There is recent evidence that depression in the mothers of young infants may impair mother-infant interaction, and that there can be adverse effects on the cognitive

development and behaviour of infants (Cogill et al. 1986; Caplan et al. 1989; Wrate et al. 1985; Murray 1992; Stein et al. 1989). However, it is not clear to what extent these infant deficits are the result of depression in the postnatal period itself, and how much they arise from subsequent or chronic depression, marital conflict or maternal trait anxiety.

3.4.3 Risk factors

1.4. MATERNITY BLUES

1.4.1 Clinical features

Maternity blues is the name given to a syndrome of weeping, lability, low mood, and irritability occurring in the first few days after childbirth (Stein 1980; Kendell et al. 1981b). It is maximal on the fifth day, though it can occur at any time up to ten days postnatally. It is a common condition, affecting 50-70% of newly-delivered mothers (Pitt 1973).

1.4.2 Risk factors

Kennerley and Gath (1989), in one of a series of related studies, found maternity blues to be associated with anxiety and depression during pregnancy, fear of labour, and poor social adjustment. However, they found no association with previous mood disturbance, although such an association had been a finding in earlier studies (Yalom et al. 1968; Stein 1980). Harris (1980) also reported an association with anxiety and depression towards the end of pregnancy. Neither Kennerley and Gath (1989), nor Nott et al. (1976) found any association with circumstances of delivery.

1.4.3 Importance of maternity blues

Maternity blues is transient and self-limiting, lasting for up to a few days only. Therefore no treatment is needed, apart from reassurance. Its importance in clinical practice lies in the fact that, when severe, it may herald and merge with a clinically significant depression (Pitt 1968; Cox et al. 1982), though Kennerley and Gath (1989) found no link to later depression. In a study of postnatal depression, a relationship between blues and postnatal depression was found only in the absence of life events (Paykel et al. 1980). In research its importance is as a model for the study of biological determinants of major postpartum mood disorders, and Nott et al. (1976) found some significant links between pre-delivery sex steroid levels and post-delivery symptoms of blues..

1.5 PSYCHIATRIC DISORDERS OF PREGNANCY

1.5.1. Psychotic disorders

The epidemiological studies mentioned above show that the rate of admission to psychiatric hospital during pregnancy is low (Kendell et al. 1976; Kendell et al. 1987). Because psychotic illness is often florid, it seems unlikely that this is because such disorders in pregnant women are missed or because they are relatively untreated until after pregnancy (Kendell et al. 1981a). It is possible, however, that the clinical monitoring of antenatal care allows psychotic illness to be rapidly treated, before admission becomes inevitable. Nevertheless, there is little doubt that there is no excess of psychotic illness in pregnancy, and probably a genuinely low rate.

1.5.2. Non-psychotic disorders

In contrast, there is evidence from prospective studies of childbearing women that the rate of non-psychotic disorders may be high in pregnancy. Kumar and Robson (1984), for instance, found that 13.4% of their sample were suffering from depression or anxiety at 12 weeks gestation, and that the rate of new cases was 10%. Watson et al. (1984) found

that 9% of their patients had had a depressive illness at some time during pregnancy, half of these being present in the first trimester.

These studies support the view that non-psychotic disorders of mood are common during early pregnancy, though the second trimester appears to be a time of psychological well-being. Watson et al. (1984) also found an association between antenatal anxiety and postnatal depression.

Risk factors for depression and anxiety in pregnancy appear to be similar to those for depression arising postnatally. Poor social circumstances, lack of confiding support, and thoughts of termination are risk factors found in both populations (Kumar & Robson 1984).

1.5.3. Treatment and prevention

There have been no controlled trials of treatments specifically for women who are depressed or psychotic while pregnant. Furthermore, pregnant women are often excluded from studies of drug treatments on ethical grounds, because of fears of teratogenicity.

Nevertheless, there is little evidence of danger to a developing foetus from most of the drugs in common use in

psychiatry (Loudon 1987). As a result, neuroleptic drugs can be prescribed to those who require them for treatment or prophylaxis (Slone et al. 1977), although patients should not on principle receive drugs during the first trimester of pregnancy unless there is a clear clinical indication. Similarly, antidepressants can be given, though it is safe prescribing policy to use well established drugs such as the older tricyclics (Kuenssberg & Knox 1972). A newborn baby may show evidence of abrupt withdrawal, such as irritability, if its mother has been taking tricyclic drugs immediately before delivery.

The main danger from psychotropic drugs comes from lithium which can cause foetal malformations, particularly cardiac anomalies (Schou et al. 1973). There is evidence that benzodiazepines may also be associated with congenital malformation (Crombie et al. 1975).

There have been no trials of psychological treatments in pregnant women with depression or anxiety.

1.6 SUMMARY AND CONCLUSIONS

A great deal of research has been conducted into the psychiatric disorders associated with childbearing, particularly into the rates and risk factors of postnatal disorders. The following conclusions are relevant to the experimental work presented in subsequent chapters.

1 There is a strikingly high rate of severe mental illness in postnatal women, particularly in the first postnatal month.

2 The majority of these severe illnesses are major affective disorders, with depressive illnesses being most common.

3 The risk factors for postpartum psychosis reflect its biological aetiology but it appears to be associated also with some psychosocial factors and life events, including being unmarried and perinatal death.

4 Although, there is no clear dividing line between postpartum psychosis and postnatal depression, the latter diagnosis represents a less severe, non-psychotic mood disturbance occurring later in the postnatal period - in the first few postnatal months - with onset most likely in the first few postnatal weeks.

5 The risk factors for postnatal depression include poor support, marital discord and recent life events.

6 Severe mental illness is relatively uncommon during pregnancy.

7 Non-psychotic mood disorders, however, are common during pregnancy, particularly in the first trimester.

CHAPTER TWO

SUICIDE AND SELF-HARM

2.1 INTRODUCTION

2.12.1 INTRODUCTION

2.1.1 Scope of this chapter

A comprehensive review of suicide and self-harm is beyond the scope of this thesis; instead, the review below is a selective account of key findings on rates, risk and prevention, with particular emphasis on findings that are most relevant to the experimental work described in subsequent chapters.

2.1.2 Definitions

Suicide is the deliberate act of self-destruction. Non-fatal acts of self-harm, once referred to as attempted suicide, are now described by the terms parasuicide and deliberate self-harm, and no assumption is made about the motives of the person who carries out such an action. The terms parasuicide and (deliberate) self-harm will be used interchangeably in this and later chapters.

2.2 EPIDEMIOLOGY

2.2.1 International comparisons

In many countries suicide is the cause of a small but significant proportion of total mortality, although rates vary widely. The variation arises in part because of inconsistent practices in the recording of cause of death, influenced by legal, moral and cultural taboos. In addition, differences in crude (i.e. all ages) national rates also reflect the different age composition of developing and developed countries. But it also seems certain that reported patterns of cross-national variation reflect genuine differences.

In general, rates are higher in Europe and countries whose population is European in origin, such as the USA, Canada, Australia and New Zealand, than in the developing world. Within Europe, rates are highest in the north and east - Hungary has recorded a rate of over sixty per 100,000, five times the rate in the UK. Moslem countries report low figures (WHO 1990).

Despite these differences, certain common trends are evident. In most countries of the world the suicide rate has been increasing steadily for several decades, mainly

because of a rise in suicide among young men (WHO 1990).

2.2.2 Rates in the United Kingdom

In the last two decades the annual suicide rate in the UK has been around 10 per 100,000 population. However, a further 3 per 100,000 deaths have been recorded as resulting from an "external cause, cause undetermined"; these are usually suicides but, as in the case of open verdicts at coroner's inquest, the evidence for this has been considered insufficiently conclusive. In addition, it is generally thought that some "accidental" deaths, e.g. single-person car accidents, are suicides - certainly there is evidence that psychiatric patients have a high rate of accidental death (King & Barraclough 1990), some of which may result from injuries that are self-inflicted.

The suicide rate in the UK has fluctuated throughout the twentieth century, falling most obviously during both world wars. Rises were recorded during the early 1930s, a time of high unemployment, and the late 1950s, one of relative prosperity. The rate fell in the mid-1960s after the relatively non-toxic natural gas was introduced into the domestic gas supply but since the early 1970s has risen gradually. In recent years there have been over 5000 suicides and deaths from cause undetermined annually in the UK. This represents 1% of total mortality. However, in

young adults suicide is one of the three principal causes of death (the others are road traffic accident and malignant disease). A number of demographic characteristics influence the suicide rate, and these are summarised below.

2.2.3 Age

The effect of age on suicide rates in the United Kingdom has changed in the last two decades. Until then, suicide rates tended to increase with age in both sexes. However, since the mid- to late 1970s there has been a large increase in the suicide rate in young men (McClure 1985), and this has affected overall population rates. There has been no equivalent rise in the suicide rate in young women.

The effect of age on male suicide rates continues to change. Mortality statistics published by the Office of Population Censuses and Surveys for 1991 show a rate of 10.8 per 100,000 in men aged 15-24, rising to 17.2 per 100,000 in men aged 25-34, and reaching a peak of 18.7 per 100,000 in men 35-44 (OPCS 1993). The rate then falls to 10.8 per 100,000 in men aged 65-74, before rising to a maximum of 21.9 per 100,000 in men aged 85 and over. There are therefore two peaks, in the age groups 35-44 and 85 and over.

However, these figures represent only those deaths recorded as suicide at coroner's inquest and exclude a number of likely suicides recorded as open verdicts at coroner's inquest and categorised as deaths from "external cause, cause undetermined" by OPCS. Death rates subsequently published by OPCS include these in the category of deaths from "injury undetermined whether accidentally or purposely inflicted".

In 1991, male rates of death from undetermined cause followed a pattern closely similar to that of deaths from suicide. There were two peaks, 8.0 per 100,000 in men aged 25-34 (slightly higher than the rate of 7.6 per 100,000 in men aged 35-44) and 11.4 in men aged 85 and over (OPCS 1993).

Suicides by women are affected differently by age, and in general the rates follow a pattern of rising with age until old age. In 1991, the suicide rate in women aged 15-24 was 2.2 per 100,000 and this rose steadily to a peak of 5.9 per 100,000 in women aged 75-84. In women aged 85 and over the rate fell to 4.7 per 100,000.

Similarly, the rate of deaths from cause undetermined tended to increase with age up to a rate of 4.7 per 100,000 in women 85 and over, but with a small peaks of 3.6 per 100,000 in the age group 45-54.

In summary, there has been a recent change in the age distribution of suicides, arising from a change in the suicide rate in young men but not in young women. In the adult female population it is the younger age groups who appear to be at least risk of suicide.

2.2.4 Sex

Suicide is considerably more common in men. In general, the crude rate in men is now three to four times higher than that in women. However, the sex difference varies according to age in a way that, as described above, has recently changed because of the rise in suicides by young men.

In 1991, the age-adjusted suicide rates in England and Wales were 11.6 per 100,000 in men and 3.3 per 100,000 in women, a male to female ratio of 3.5 (OPCS 1993). If deaths from undetermined cause are included, the figures become 16.9 per 100,000 in men and 5.9 in women, a male to female ratio of 2.9 (OPCS 1993).

However, the male to female ratio for recorded suicides varies from around 5 in young adults to around 2 in the age group 65-74. When deaths from undetermined cause are included, the sex ratios vary from around 4 in young adults

to just under 2 in 65-74 year-olds.

The recent increase in suicide by young men is unexplained, though possible factors include a rise in the use of alcohol and drugs, increases in the divorce rate and unemployment, and the use of more dangerous methods of self-harm. Whatever the explanation is, it must apply to men only, to account for the widening disparity in suicide rates in the two sexes. This means one of three things:

(1) the factors responsible for the rise in young male suicides do not occur in women; or

(2) these factors are experienced differently by men and women; or

(3) women are protected from the adverse effects of experiences that they share with men.

These possibilities, although not the subject of the experimental work in later chapters, will be considered in the light of the results described.

2.2.5 Social class and employment

The suicide rate varies according to social class, with the

highest rate being found in social class V, followed by the highest (professional) class. The lowest rate is found between these, in skilled workers (social class III). Unemployment is a risk factor (Sainsbury 1955), as are certain forms of employment such as medicine and farming. The risk among university students also appears to be high (Hawton et al 1978).

2.2.6 Race and immigration

The suicide rates of immigrant ethnic minorities often reflect the rate in their country of origin. Thus in the UK, the suicide rate is lower among Afro-Caribbeans and higher in Eastern European immigrants than it is in the indigenous population (Soni Raleigh & Balarajan 1992). In the USA and Canada, high rates have been reported in native North Americans. Specific racial sub-groups, such as young Asian women in the UK, appear to be at high risk (Soni Raleigh et al. 1990).

2.2.7 Marital status, children and living circumstances

Suicide is more common in people who are single, separated or divorced, or widowed (Durkheim 1952 - original publication 1897). Recent widowhood is thought to be an

important risk factor in the elderly but one study (Kreitman 1988) of marital status and male suicide found that bereavement had most effect on relatively young adults while divorce was associated with the greatest risk in the elderly. Part of this risk is presumably related to living alone which appears to be independently associated with suicide.

It is a longstanding finding that in both sexes people with children are at least risk of suicide (Durkheim 1952). To what extent these lower rates in people who are married are associated with parenthood rather than marital status *per se* is unclear. Durkheim concluded that there were three reasons for low suicide rates in married people:

- 1 people who marry are constitutionally less vulnerable
- 2 the marital relationship is protective
- 3 the family is protective.

In Durkheim's studies, both being married and having children reduced the risk of suicide. Compared to unmarried men of the same age group, the risk of suicide in married men without children was found to be reduced by a "coefficient of preservation" of 1.5 (i.e. the rate in childless married men was two-thirds of that in unmarried men). In married men with children the figure was 2.9 (i.e. the suicide rate was reduced to one third of that in unmarried men and one half of that in married men without



children). In women the risk in those who were married with children was just over half that of unmarried women, while married women without children had *higher* rates than unmarried women.

Veevers (1973) examined U.S. suicide rates in men and women who were divorced, married or single, looking for evidence that differences could be attributed to the presence or absence of children. According to Veevers, three findings relating marital status to suicide were evidence of the protective effect of children. Firstly, the difference in risk of suicide between single and married people increased with age (lower rates in married people), and a possible explanation was that as married people grew older they became more likely to have children. Secondly, divorce increased the rate of suicide in men more than in women, perhaps because children were more likely to remain with their mothers following divorce. Thirdly, widowed men seemed to be protected less than divorced men by the presence of children, possibly because any protective effect would be less in men who were unprepared for child care.

A recent Norwegian epidemiological study found an inverse relationship between suicide in women and the number of children in the family (Hoyer & Lund 1993). In this study, identifying information from the 1970 Norwegian census was

linked to a register of deaths. Of 989,949 women in the census, 1190 were found to have died by suicide during the fifteen years of follow-up. Marital status and parity were known from the census, and it was possible to calculate the relative risk associated with these. A linear relationship was shown between number of children and suicide rate, i.e. the greater the number of children, the lower the rate of suicide, the risk in women with six or more children being about one fifth of those with none, irrespective of age. Married women, whether parous or nulliparous, had lower rates of suicide than women who were single in 1970. Although these results are striking, no information on children born after the 1970 census was available, and numbers of current children could not be used in the analysis. Neither this study, nor the findings of Durkheim and Veivers, can be used to determine whether any protective effect of parenthood is greater or less in the postnatal period.

Other living circumstances also affect the suicide rate. The relative rates of suicide in urban and rural populations, for example, has varied. In the late 1980s in the UK the suicide rate was highest in rural regions such as East Anglia and the South-west, but most recent figures show the highest rate in the North-west, a more urban region. Socially and economically poor parts of cities, where social isolation is common, also tend to show high

rates (Sainsbury 1955).

2.2.8 Psychiatric and behavioural history

A history of mental illness is one of the most important of all risk factors. A study of Swedish conscripts, i.e. age and sex uniform, found it to be the most powerful predictor of suicide over the next 13 years, leading to an 11-fold increase in risk (Allebeck & Allgulander 1990). Most studies have identified depression as the most frequent mental disorder, and it has been shown that most, if not all, suicides have suffered from some form of psychiatric disorder before death with depression being the most common (Robins et al. 1959; Barraclough et al. 1974).

However, the recent rise in suicide by young people may break with this established pattern, as young suicides appear to be less likely to be in contact with psychiatrists or to visit their general practitioners before death (Vassilas & Morgan 1993) than previous findings suggested (Barraclough et al. 1974). One interpretation of this change is that these young suicides may occur at times of distress rather than depression (or other clinical disorder).

Other psychiatric diagnoses associated with suicide are

schizophrenia (Allebeck & Allgulander 1990), alcohol dependence (Kessel & Grossman 1965; Barraclough et al. 1974), drug misuse (Fowler et al. 1986) and personality disorder (Ovenstone & Kreitman 1974). There is a strong association with previous non-fatal self-harm, criminality, and chronic physical illness (Robins et al 1959; Barraclough et al. 1974).

The characteristics of suicide by people with mental illness are considered below in section 2.3.

2.2.9 Biological factors

A family history of suicide increases the individual's risk of suicide (Shafii et al. 1985; Tsuang 1983), a finding that may be explained by observational learning as well as genetic predisposition. However, the genetic explanation is supported by twin studies that have shown an increased concordance for monozygotes (Roy 1990), and a study of Danish adoptees who have committed suicide which found a high rate of suicide in their biological but not adoptive parents (Schulsinger et al. 1979; Wender et al. 1986).

What is inherited is unknown. The most consistent findings from biochemical studies of the cerebrospinal fluid of suicides are of reduced 5-hydroxyindoleacetic acid,

reflecting reduced serotonin metabolism in the brain (Traskman et al. 1981). This may be related to impulsive or violent suicidal behaviour independent of psychiatric diagnosis (Asberg et al. 1976; Orelund et al. 1981).

2.2.10 Seasonality

Just as the prevalence of depression shows seasonal variation, with higher rates in winter months, the suicide rate also follows a seasonal pattern. In the UK the rate is highest between April and June, and most countries - including those in the Southern hemisphere - show a similar rise in spring.

2.2.11 Methods of suicide

In the UK in the 1970s the most frequent method of suicide was self-poisoning by drug overdose. Since then, however, the commonest methods have been hanging and self-poisoning with car exhaust fumes (McClure 1987), each of which now accounts for 25-30% of self-inflicted deaths (OPCS 1993). In women drug overdose remains the principal method, accounting for around 50% of deaths, the main substances used being analgesic and psychotropic drugs. In the USA firearms are the commonest means of suicide in males

(Tsuang 1992). Certain methods are associated with specific groups, e.g. self-immolation in Asian women (Soni Raleigh et al. 1990).

2.3 SUICIDE AND MENTAL ILLNESS

2.3.1 Suicide risk

Suicide is the most serious consequence of psychiatric illness and most major psychiatric disorders carry a high suicide risk. In the UK approximately 50% of all suicides have history of contact with psychiatric services, although the figure appears to be less in young adults (Vassilas & Morgan 1993). The exact risk has been estimated in cohort studies such as those of Rorsmann (1973) who found a rate of 1.4% in the five years following out-patient attendance, and of Martin et al. (1985) who found the rate of "unnatural mortality" in out-patients to be three times as high as in the general population. Using a similar approach Pokorny calculated the rate to be 165 per 100,000 person-years at risk, sixteen times the general population rate. However, the risk is not uniform over time, and has been found to be raised over thirty-fold in the six months since last hospital discharge (Temoche et al. 1964; King & Barraclough 1990)

2.3.2 Risk factors

A number of demographic and social characteristics increase

the suicide risk further in psychiatric patients. In general these are similar to risk factors in the population as a whole. Studies have found an association with male sex, low social class, being single, divorced or widowed, and living alone. However, most studies, not only those that are recent, have found young rather than older males to be at risk. King & Barraclough (1990) found the relative risk of suicide following hospital discharge to be thirty-nine in men aged 35-44, and four in men over seventy-five years.

The most consistently reported clinical risk factor is a history of parasuicide, which is found in 50% of psychiatric suicides (Rorsmann 1973; Myers & Neal 1978; Roy 1982a). The most recent admission is twice as likely to have followed self-harm (Flood & Seagar 1968), and there is a tendency for the previous self-harm to have been violent or particularly dangerous (Rorsmann 1973; Myers & Neal 1978). Additional behavioural risk factors are addiction to alcohol or drugs, and antisocial personality (Martin et al 1985). The characteristics of suicide in specific syndromes are as follows:

Schizophrenia Most estimates of the suicide rate in schizophrenia are in the region of 5-10%, slightly less than in major affective disorders, although one Swedish study found schizophrenia to be the diagnosis most at risk

(Allebeck & Allgulander 1990). The same Swedish group also studied a cohort of discharged in-patients with schizophrenia and found the rate of suicide over the next ten years to be 3.9%. The standardised mortality ratio was raised in both sexes, at 9.9 in men and 17.5 in women (Allebeck & Wistedt 1986). These figures, although as the results of a single study they can not be regarded as conclusive, suggest that the additional risk of suicide conferred by mental illness may be greater in women, even though men may remain at higher risk. In other words, the factors that lead women in the general population to be at lower risk of suicide may exert less influence in women with mental illness.

A number of mental state features have been related to suicide, particularly depressed mood (Roy 1982b; Cohen et al. 1990; Drake et al. 1984), suicidal ideas (Roy 1982b; Drake et al. 1984), and hallucinations with a suicidal content (Roy 1982b; Crammer 1984; Sims & O'Brien 1979). A past history of depression has also been linked to later suicide (Cohen et al. 1990), underlining the importance of low mood, even when the primary diagnosis is not affective disorder.

However, this is not a universal view. One study found that the relationship with depression *per se* disappeared once multivariate analysis had controlled for the symptom

of hopelessness (Drake & Cotton 1986). Another found no link to depression and concluded that most schizophrenic suicides were impulsive rather than mood-related (Allebeck et al. 1987).

Only one study has reported a relationship between suicide and aspects of insight, namely an awareness of the effects of the illness, and fear of further mental disintegration (Drake et al. 1984). However, several have found risk to be greatest during the period of clinical recovery (see below).

Affective disorders The long-term risk of suicide in primary affective disorder has been estimated at 15% (Guze & Robins 1970), this widely-quoted figure being based the varying results of early studies. More recent long-term follow-up studies have reported lower rates, however - 8.5% in the case of in-patients with depression (Berglund & Nilsson 1987), and 3.6% in a cohort of affective, including schizo-affective, disorders (Fawcett et al. 1987; Fawcett et al. 1990). A number of clinical features seem to be linked to suicide, and these appear to vary with time, early (within one year) deaths being associated with anxiety, panic, insomnia, anhedonia, poor concentration and alcohol abuse, while longer term risk is associated with hopelessness (Fawcett et al. 1990; Beck et al. 1985). Many studies have confirmed the importance of the symptom of

hopelessness in determining eventual suicide (Weishaar & Beck 1992) or suicidal intent (Dyer & Kreitman 1984) in depression.

There have been no studies designed specifically to study suicide in postpartum psychosis or postnatal depression. Suicide in childbearing women is discussed further in chapter 3.

Alcoholism The long-term suicide rate in alcoholics who have been in-patients has been calculated to be 6.7% (Berglund & Nilsson 1987), though this represents less than half of total mortality. Once again, a past history of depression is the most important clinical risk factor (Berglund 1984), and recent loss of a relationship, usually by separation, has been described in one-third of suicides (Murphy et al. 1979). Similarly, interpersonal loss or conflict has been reported as preceding many suicides by substance (including alcohol) abusers (Rich et al 1988).

Neurosis When neurotic disorder is severe enough to require admission, the suicide rate appears to be as high as in major mental illness. One follow-up of in-patients found the relative risk to be 6.8 (Sims & Prior 1978) when neurotic depression was included. Most later studies of anxiety-related disorders, excluding depression, have confirmed an elevated rate of suicide, and this has been

attributed primarily to the risks in patients with panic attacks or disorder (Coryell et al. 1986). The long-term risk of suicide in anorexia nervosa appears to be high - 7% in one recent follow-up study (Ratnasuriya et al. 1991).

2.3.3 Timing

This can be considered under two headings - the period of maximum risk during the lifetime course of an illness, and the time of maximum risk during a single episode.

Duration of illness Most of the research evidence points to a maximum risk during the first few years of an illness: several studies have found a mean illness duration of less than four years (Flood & Seager 1968; Cohen et al. 1990; Goh et al. 1989). However, this is not a universal finding, possibly because of differences between patient samples, and no time can be regarded as characteristic. One study of suicide in schizophrenia reported a sex difference, longer histories being found in women (Roy 1982b).

Episode The beginning of an acute relapse and the recovery period represent the times of maximum risk during an episode of illness (Copas et al. 1971; Gale et al. 1980). Eighteen per cent of in-patient suicides have been reported

to occur within a week of entering hospital (Crammer 1984); eighteen per cent of discharged suicides within one week of leaving (Roy 1982a). Fifty per cent of psychiatric suicides occur within 1-3 months of discharge (Flood & Seager 1968; Roy 1982a). The majority die within a month of their last appointment with a psychiatrist (Roy et al. 1982a) or general practitioner (Myers & Neal 1973).

2.3.4 Methods of suicide

Violent methods of suicide are more common among psychiatric suicides than the general population, accounting for 70-90% of deaths (Goh et al. 1989; Langley & Bayatti 1984; Morgan & Priest 1991; Roy 1982a). Similarly, studies of suicide by jumping from a height have found a preponderance of severe psychiatric illness (Cantor et al. 1989; Pounder 1985; Sims & O'Brien 1979). However, in non-psychotic disorders such as sociopathy and alcohol or drug dependence, overdose remains a common method (Ovenstone & Kreitman 1974).

2.3.5 Suicide and psychiatric services

Location The increased risk of suicide at the beginning and end of an episode of illness raises the question of how

the current development of community-based care, with delayed and shorter admissions, will affect the suicide risk in psychiatric patients. In Sweden, shortened admissions have been blamed for a rise in suicide soon after discharge (Perris et al 1980) but the evidence of shorter admissions in those patients who go on to commit suicide is conflicting (Flood & Seager 1968; Roy 1982a). Rapid deinstitutionalisation in Italy did not coincide with a rise in suicide (Williams et al. 1986). One study in the UK, although finding no overall change in suicide after a community psychiatric service began, believed the risk in the elderly had declined (Walk 1967).

Aspects of care Little evidence exists on the effect of individual components of psychiatric care, although one study reported no effect of social case work or day care (Roy 1982b). Inadequate treatment, particularly of depression, increases the risk (Modestin 1985; Myers & Neal 1978; Rorsmann 1973) but many suicides are receiving suitable prophylaxis or treatment (Schou & Weeke 1988; Wilkinson & Bacon 1984). The fact that relatively toxic drugs such as tricyclic antidepressants are sometimes used as the means of suicide implies that newer, less toxic alternatives should be used in depression. However, suicides by people who are on antidepressants do not appear to be associated with older tricyclics (Isacson et al. 1994).

Poor relationships with staff (Flood & Seager 1968; Morgan & Priest 1984; Virkkunen 1976), inadequate staff numbers or morale (Coser 1976; Crammer 1984; Kahne 1968), and inadequate ward design or location (Crammer 1984; Sims & O'Brien 1979) have been linked to hospital suicides.

It is estimated that there are 100,000 episodes of LTP each year in the UK, with a 10% mortality rate. The figure is believed to be at least 200,000. Many deaths are preventable, but it is difficult to estimate the true figure as many deaths are not reported, although the rate among inmates in the UK appeared subsequently to fall (Plett et al. 1987).

Many of the risk factors for personality disorder are linked with social and interpersonal adversity and may also be associated with completed suicide. However, the population at greatest risk differs, being more at risk in the case of personality disorder than in the case of psychosis. In both cases the peak incidence of suicidal ideas and actions occurs in the early stages of illness (Plett et al. 1987). In women the risk was approximately twice as high as in men (Morgan et al. 1979; Plett et al. 1987).

There is a strong association with low social class and unemployment (Plett & Kessler 1984; Plett & Kessler 1985; Plett et al. 1987), and with being single or divorced (Bancroft et al. 1973). A high rate of life events is

2.4 PARASUICIDE

2.4.1 Rates of and risk factors for parasuicide

It is estimated that there are 100,000 episodes of self-harm annually in the UK, while in the USA the figure is believed to be at least 250,000. Many Western countries experienced a rapid rise in parasuicide in the 1960s and early 1970s, although the rate among females in the UK appeared subsequently to fall (Platt et al. 1988).

Many of the risk factors for parasuicide reflect its close link with social and interpersonal adversity, and many are also associated with completed suicide. However, the population at maximum risk differs, being early middle-aged and elderly men in the case of suicide and young women in the case of parasuicide. In both sexes the peak incidence of parasuicide comes between the late teens and early thirties (Platt et al. 1988). In women the rates are approximately twice as high as in men (Morgan et al. 1975; Platt et al. 1988).

There is a strong association with low social class and unemployment (Platt & Kreitman 1984; Platt & Kreitman 1985; Platt et al. 1988), and with being single or divorced (Bancroft et al. 1975). A high rate of life events is

found in the six months before a parasuicidal act (Paykel 1975), and difficulties in interpersonal relationships are particularly common (Bancroft et al. 1977; Morgan et al. 1975).

Many patients who harm themselves have experienced significant neurotic symptoms before the act (Newson-Smith & Hirsch 1979a) and many have recently consumed alcohol (Morgan et al. 1975). However, few have severe psychiatric illness, and the commonest diagnoses are neurotic depression, personality disorder and alcoholism. Between 10-30% have no psychiatric diagnosis (Kreitman 1977; Morgan et al. 1975; Urwin & Gibbons 1979). Impulsive and hostile behaviours are common, including towards doctors and health staff. A history of physical or sexual abuse in childhood is often obtained.

2.4.2 Methods of parasuicide

In the UK, approximately 90% of episodes of parasuicide are overdoses of drugs, often analgesics or prescribed drugs (Morgan et al. 1975; Platt et al. 1988). More violent methods are associated with suicidal intent, although it cannot be assumed that those who take relatively harmless overdoses have no wish to die. The commonest form of self-injury is self-laceration, usually of the forearms, using

glass or a razor-blade. This method tends to be used by young patients at times of mounting anxiety following an emotional, often interpersonal, crisis. Many report feelings of depersonalisation at the time of cutting, and relief of tension afterwards.

2.4.3 Risk of suicide following parasuicide

Approximately 10% of parasuicides eventually kill themselves. Suicide is associated with the risk factors for the general population - male sex, living alone, unemployment, psychiatric illness or personality disorder, alcohol or substance abuse - and with older age, previous self-harm and suicidal intent at the time of the parasuicidal act. In young people there is a particular association with substance abuse (Hawton et al. 1993).

2.4.4 Risk of repetition after parasuicide

In the three months after parasuicide, 15-25% of patients will repeat the self-harm (Buglass & Horton 1974; Morgan et al. 1976; Bancroft & Marzack 1977). Repetition can be seen as the effect of stressful life events on individuals who are cognitively vulnerable and who have developed a maladaptive pattern of stress-induced behaviour and service

contact (Appleby & Warner 1993).

Repetition is associated with several factors common in self-harm:

- (a) demographic - male sex, low social class or unemployment, living alone, being divorced or separated;
- (b) psychiatric - previous psychiatric contact, drug or alcohol abuse, previous self-harm;
- (c) behavioural - past violence, criminality.

Many of these features are also thought to be the characteristics of the young people in whom suicide has recently become more common. This suggests that suicide has become more common in a group who were previously at risk of repeated deliberate self-harm, perhaps because because the preferred method of self-harm has changed from drug overdose to the more dangerous carbon monoxide poisoning using car exhaust fumes.

2.5 SUICIDE PREVENTION

2.5.1 Preventive factors in populations

Certain population or social characteristics appear to counterbalance risk factors and act protectively to lower suicide rates. For example, low rates are found in countries where alcohol is banned, and where the prevailing religion is Islam or Catholicism. In the UK, the reported male suicide rate fell during both world wars, an echo of the Durkheim's finding that fewer suicides occurred in the mid-1800s in those countries experiencing revolution (Durkheim 1952). Durkheim postulated that vulnerable individuals were more likely to commit suicide if the cohesive forces in a society broke down, a condition he termed *anomie*. Conversely, when a society was held together more strongly, as in facing a common foe, the rate would fall. A similar explanation has been put forward to account for the stable suicide rate in Northern Ireland despite its civil war (Curran 1988).

Public health strategies often focus not on whole populations but on high-risk groups, such as people suffering from depression. After GPs on the Swedish island of Gotland were trained to recognise and treat depression, a localised fall in the suicide rate was found which was

not evident nationally (Rutz et al. 1989). However, without further training, the low rate was not sustained (Rutz et al. 1992). Although these are important findings, there are doubts about their broader applicability, for instance to heavily populated urban areas in other countries. There is also evidence that young suicides are no more likely to contact their general practitioners before death than are young non-suicides (Vassilas & Morgan 1993).

A third public health approach is to prevent access to the most common methods of suicide. For example, the present common use of self-poisoning from car exhausts suggests the need to detoxify exhaust fumes through the widespread use of catalytic converters (Wagg et al. 1993).

2.5.2 Specific treatment approaches in deliberate self-harm

Brief out-patient counselling has been shown to benefit female parasuicides and those with relationship problems (Hawton et al. 1987) but without improving the risk of repetition. Similarly, supportive and problem-solving approaches can lead to benefits in social adjustment (Chowdhury et al. 1973), social problems (Gibbons et al. 1978) and mood (Hawton et al. 1981) but any reduction in rates of parasuicide repetition has been insignificant

statistically (Salkovskis et al. 1991). However, such studies have been carried out on relatively small subject samples, many of whom are unlikely to repeat self-harm even without any intervention. With a larger sample size, particularly of high-risk repeaters, such interventions may be capable of demonstrating effectiveness in reducing repetition.

The follow-up period in these studies may also be too short to allow the demonstration of change. In contrast, a form of psychotherapy based on cognitive-behavioural methods has been able to reduce repetition over one year, when used intensively in vulnerable (borderline) individuals (Linehan et al. 1991).

2.5.3 Services for self-harming individuals

Some studies in deliberate self-harm have assumed that the appropriate treatment is a combination of emotional support, problem-solving advice, and regular follow-up, and have focused on how to provide this overall package of treatment. All studies agree that both initial assessment of suicide risk and further follow-up can be satisfactorily carried out by staff other than psychiatrists. After suitable training, social workers (Newsom-Smith & Hirsch 1979b) and nurses (Catalan et al. 1980) can perform skilled

assessments of parasuicides. The benefits of counselling (with female patients and in relationship problems) do not differ whether it is administered by psychiatrists, general practitioners or non-medical staff, at a clinic or at the patient's home (Hawton et al. 1981; Hawton et al. 1987). Better outcome, measured by further episodes of self-harm, has been found in those parasuicidal patients who receive (or accept) psychiatric assessment and continuing contact (Greer & Bagley 1971; Kennedy 1972).

The benefit of suicide services, such as the Samaritans in the UK, has not been proved. Although they provide valuable support to people in crisis, and may dissuade individuals from killing themselves, there is no clear evidence that their impact is sufficient to reduce suicide rates (Jennings et al. 1978). However, the availability of such services may be valuable to some self-harming individuals in crisis. One recent pilot study has shown that giving a contact telephone number given to patients after an episode of self-harm was associated with a reduction in subsequent self-harm without excessive use of the contact number (Morgan et al. 1993).

In summary, there are few research findings to guide clinical practice towards specific preventive interventions. Clinical services should aim to identify and closely supervise certain high-risk groups while

recognising that suicide prevention requires a public health policy directed at the social risk factors and common methods of self-harm.

This objective will be achieved by the following measures:

1. The use of the strongest available evidence of suicide is necessary to inform policy, particularly in relation to mental health services. This will be the first of a series of reports that will be published in the coming months.

2. Suicide is a public health problem that should be addressed in a similar way to other public health problems. The public health approach to suicide prevention is based on the identification of risk factors, which are defined by the public health approach. This approach is based on the identification of risk factors for suicide, which are defined by the public health approach.

3. The female population as a whole has a low rate of suicide in comparison to men, suggesting that the social factors for suicide are less common or more easily avoidable in women. In the presence of mental illness, women may be less protected.

4. Within the female population the rate of suicide is

2.6 SUMMARY AND CONCLUSIONS

This selective review of suicide research highlights several findings of relevance to the present experimental work on suicidal behaviour in postnatal women. These are summarised below.

1 One of the strongest associations of suicide is mental illness, particularly depression and psychotic illnesses. These are the two forms of mental disorder that occur in postnatal women.

2 Suicides in people with psychiatric disorders tend to cluster around episodes of acute illness or relapse. Postpartum disorders are frequently acute or relapsing conditions, almost by definition. These periods of maximum risk are therefore part of the natural history of postpartum illness.

3 The female population as a whole has a low rate of suicide in comparison to men, suggesting that the risk factors for suicide are less common or exert a less powerful effect in women. In the presence of mental illness, women may be less protected.

4 Within the female population the rate of suicide is

lowest in the younger age groups, including the age groups that show the highest birth rates, i.e. from early twenties to early thirties.

5 In contrast, parasuicide is more common in women than in men, and the rate of parasuicide in women is highest in the same young age groups.

6 The risk factors for suicide and parasuicide include marital status, i.e. married individuals of both sexes are at lowest risk, being married with children, and living alone. Suicide is less common in parents of both sexes and parenthood may account for a large part of the protective effect of marriage. Postnatal women are more likely than other population groups to have a marital (or equivalent) relationship.

7 The recent rise in the suicide rate in young men has not been seen in women. This suggests that the causes of the increase in young male suicide are not found in women, or that they exert less effect.

8 The symptom of hopelessness is related to suicide risk. One study has even found that it is this cognition that determines the relationship between depression and suicide.

9 Repetition of self-harm has proved difficult to prevent

in research studies of service interventions. However, this may reflect low statistical power in the study design, rather than ineffectiveness of intervention. One study of a form of psychotherapy derived from cognitive therapy (Linehan et al. 1991) has shown a reduction in episodes of self-harm after intensive treatment lasting one year.

CHAPTER THREE

SUICIDE AND SELF-HARM IN POSTNATAL AND PREGNANT WOMEN

3.1 INTRODUCTION

There is little in the research literature to address directly the risk of suicide or self-harm in women who are in the postnatal period; this is largely true of women who are pregnant also. In studies of the epidemiology of suicide, information on current or recent pregnancy is not usually reported, partly because it is not easily available. Studies of the details of individual suicides, known as "psychological autopsy" studies, could provide such information but have not been able to do so, for two main reasons. Firstly, they are difficult studies to carry out, and relatively few in number, and none has set out to address the subject of suicide in childbearing women. Secondly, they usually study suicides in a particular locality and so are based on limited overall numbers, of whom young women form only a minority.

Similarly, studies of postnatal disorders are either population-based, in which case information on suicide is not recorded or available, or clinical, in which case the numbers are too small to include substantial numbers of suicides.

In the absence of direct studies, information on suicide and self-harm in postnatal women tends to be indirect, i.e.

most published information comes from research whose principal hypotheses are on other subjects. In addition, studies that refer to suicide and self-harm in pregnant women have often been concerned with termination of pregnancy, its psychiatric indications, and the risks of refusing a woman's request for termination. Most of these studies were published two or three decades ago, at a time when liberalisation of abortion laws was being considered in the U.K. and elsewhere. Clearly, any research on women seeking termination may say little about pregnant women as a whole, and subsequent changes in the law on abortion may leave its conclusions out of date.

This chapter will briefly summarise the evidence on suicide and self-harm in people with children of any age, as described in more detail in Chapter 2, before considering postnatal and pregnant women.

3.2. SUICIDE AND SELF-HARM IN PEOPLE WITH CHILDREN

3.2.1. Suicide and children

As discussed in Chapter 1, women in the postnatal period have a considerably higher rate of severe mental illness than women at other times, and it follows that their risk of suicide and self-harm should also be higher than that of other women, including women with older children.

The lower risk of suicide in people with children was, as mentioned in Chapter 2, commented on by Durkheim almost a century ago (Durkheim 1952 - original publication 1897), but there has been little subsequent experimental evidence to confirm his conclusions, although Veevers (1973) provided indirect supportive evidence, as outlined earlier. Hoyer and Lund (1993), however, showed that the risk of suicide in women correlated negatively with the number of children they had under the age of sixteen.

Hoyers and Lund did not attempt to relate risk of suicide to the age of children as well as their number. It is possible, therefore, that the effect they describe was in part related to having young children, because those who had several children under sixteen would be more likely to have a younger child than those who had one or few. None

of these studies makes specific mention of postnatal women, who could be seen, because of their high rate of major mental disorder, as a high-risk sub-group.

Linehan et al. (1983) studied the issue in a different way, asking a sample of the public in Seattle what would prevent them from committing suicide if they were in distress, finding that child concerns, religion and fear of pain were the most common replies. From these answers they constructed a Reasons for Living Inventory, and this they gave to two groups of in-patients - those who had had suicidal thoughts and those who had carried out a self-harming action. The two groups differed only on child concerns - specifically, that suicide would harm the children, that it would be unfair to leave the children to the care of someone else, and a desire to watch the children growing up. Child concerns were therefore thought to represent an important source of protection against self-harm.

3.2.2. Suicide, self-harm and marriage

Marriage was one of the principal social phenomena investigated by Durkheim (1952) who found that being married was associated with low rates of suicide. Durkheim demonstrated, as described earlier, that a large part of

this protective effect could be attributed to parenthood, rather than marriage itself.

Lower rates in people of all ages who are married have also been demonstrated in later population studies such as that of Kreitman (1988). Similarly, in the 100 suicides investigated by Barraclough et al. (1974), young married men and women were thought to be at low risk. Non-fatal self-harm has also been clearly linked to being single or divorced (Bancroft et al. 1975; Platt et al. 1988).

3.2.3 Suicide, self-harm and age

It is a well established feature of suicide statistics in the U.K. that young women, those who are in the childbearing years, have the lowest rates (OPCS 1993). As already described in Chapter 2, they have not experienced the rise in suicide seen in young men in the last two decades. In contrast, young women have the highest rates of non-fatal self-harm in most studies.

Whether postnatal women conform to the population findings on suicide in all young women, or whether these national statistics disguise a high risk group in postnatal women has not been studied.

3.3 SUICIDE AND SELF-HARM IN POSTNATAL WOMEN

3.3.1 Evidence from studies of postnatal populations

Suicide Suicide is a relatively uncommon event, and in women in the U.K. or the U.S.A. occurs at an annual rate of up to 4 - 5 per 100,000 (the rate in the youngest adult age groups is less - approximately half this figure). Even if the rate were elevated several times in postnatal women, most studies in the field, being estimates of morbidity rates, would contain far too few subjects to expect even one suicide. For example, the prospective studies of Kumar and Robson (1984), Watson et al. (1984) or O'Hara et al. (1984), being based on around 100 subjects, could expect 0.005 suicides in the first postnatal year, according to the above rate. This means that the risk of suicide in postnatal women would have to be increased 200-fold to produce just one suicide. Not surprisingly, therefore, no clinical study of this kind has reported a suicide among its subjects, and no study based on this design, in which a sample of postnatal women are assessed, could be expected to estimate the risk of suicide.

Hook (1963) studied a different group of postnatal women, 249 Swedish women who had been refused abortion in 1948, following them up for between seven and twelve years.

There were no suicides, but again the number of women was too small to allow an estimate of the suicide risk unless this had proved to be dramatically high. Similarly, neither Sarrel (1966) nor Gabrielson (1970), in following up 123 and 105 teenage mothers for five and two years respectively, found any deaths from any cause, although Sarrel was unable to trace twenty-three subjects.

Most studies of maternal mortality have been primarily interested in obstetric causes of death, and most have not mentioned suicide. One, conducted in New York, referred to only one suicide in three years, occurring ten days postpartum and five days after a cot death, but excluded this case from its analysis of mortality on the grounds that the link to childbirth itself was incidental (Dorfman 1990).

Three studies of maternal mortality, however, have made more specific reference to suicides in their samples. One of these, also from New York, examined a four-year sample of 224 deaths during pregnancy or in the first postnatal year, of which five (2.2%) were suicides (Syverson et al. 1991). This corresponded to 0.9 suicides in 100,000 live births, a figure that would be a low rate for an adult female population. No further details were given.

The other two studies suggested that suicide was a more

significant cause of maternal death. Sachs et al. (1987) found 886 deaths during pregnancy or in the first ninety days postpartum in Massachusetts in the years 1954-1985. Over this period mortality fell overall but deaths from traumatic causes - suicide, homicide and road accident - increased to become the commonest cause of death by 1982-85. However, the total death rate from trauma remained low at 1.9 per 100,000 births, and the proportion of these deaths that were the result of suicide rather than other forms of trauma was not presented. Deaths during pregnancy and the postnatal period were not distinguished. No other details were given.

Larger numbers of suicides were found, however, by Hogberg et al. (1994) in a study of Swedish national data on births and deaths. Deaths within one year of childbirth were collected for the years 1980-1988. Of 207 deaths in the first postnatal year, thirty-one were suicides. Only three of these occurred during the first six weeks, suicide being a minor cause of such "early" maternal deaths. In the remainder of the year, suicide was one of three leading causes, accounting for twenty-eight cases. These results suggest that suicides occur at a similar rate throughout the first postnatal year, and as a result become a more important proportionate cause of maternal death after the puerperium. Among these thirty-one suicides, violent methods were "common", and there were only four deaths from

self-poisoning. This study is one of the few to report details of timing and method, but its lack of a comparison sample does not allow it to calculate a relative risk of suicide in postnatal women.

Only one study of maternal mortality has set out specifically to identify suicides in postpartum women, to determine rates and examine clinical details (Barno 1967). In this study, all maternal suicides, in both pregnancy and postnatally, during the a sixteen year period 1950 - 1965 were collected. In this time there were 1,301,745 live births in Minnesota and fourteen maternal suicides of which ten occurred postnatally. Maternal suicides occurred at a rate of 1 per 92,982 live births, and the annual suicide rate in women who were or had recently been pregnant varied from zero to 0.2 per 100,000, compared to 3.1 - 5.2 in the female population as a whole.

Of the ten postnatal suicides, all had occurred within the first three months postnatally, three within the first postnatal month. Eight were said to be suffering from psychotic depression and two from schizophrenia, following retrospective examination of their casenotes. Their methods of suicide were violent or "active" in all cases - three were drowned, three used guns, and the other four died by hanging, jumping in front of a train, car crash and cutting of the throat. There was no preponderance of young

or primiparous women, and the age range was 21-39 years, with no apparent clustering in any age group within this range.

These results can be criticised, however, in that the comparison with overall female suicide rates takes no account of age, an important influence on both suicide and birth rates in that suicide increases with age while births tend to be commonest in women in their twenties. Furthermore, the fact that no suicides were reported after the third postnatal month raises the possibility that the figures omitted suicides occurring later, as they did in substantial numbers in the Swedish study. Nevertheless, the findings suggest that the rate of suicide in postnatal women is low and that those who do commit suicide are suffering from psychotic illness.

Studies based on patients who are already identified as ill, and therefore at relatively high risk of suicide, are unlikely to include enough suicides to allow an accurate estimate of rate. For example, the main population-based studies of severe postpartum illness have examined admission rates within a particular locality, and though their findings on admission are striking, their numbers are too small to expect appreciable numbers of suicides. In Paffenbarger's (1964) study, there were 314 patients, of whom 242 were admitted postnatally; in Kendell's Camberwell

study there were 99 women on the case register, but only 24 admissions (Kendell et al. 1976); in Kendell's Edinburgh study, there were 120 admissions within three months of childbirth (Kendell et al. 1987). The suicide rate in postpartum psychosis would have to be exceedingly high in the short term to lead to enough suicides to allow a reliable calculation, and even then the risk of suicide in the postnatal population as a whole would be difficult to derive. Consequently, neither Paffenbarger's nor Kendell's studies refer to suicide.

Brew (1950), in describing 103 cases of psychosis in pregnancy or arising postnatally, and Sim (1963) in describing 213 psychotic cases, most postnatal, reported that there had been no suicides. Although the precise period of follow-up was unclear, it is likely that both studies were referring to the duration of the acute illness.

Even longer term follow-up studies of postpartum psychosis, however, appear to have included few suicides in the first postnatal year, although they have reported longer term mortality from all causes. Protheroe's (1969) study of 134 cases described fourteen deaths during the index illness and eight more during the years of follow-up. Causes were generally not stated, however, and only one appeared to have been a suicide - a death a few days after initial

discharge. Da Silva and Johnstone (1981) examined the histories of forty-five women whose history of major illness had begun postnatally 1-6 years earlier. Two had died, both by suicide; one of these deaths occurred in the postpartum episode, eight months after onset. Platz and Kendell (1988) found one suicide in their nine-year follow-up of postpartum admissions, compared to four suicides in a non-puerperal comparison sample, although the timing of the puerperal suicide is not stated. Davidson and Robertson (1985), in their uncontrolled follow-up of eighty-two of a sample of ninety-four postpartum admissions, found that four patients (5%) had committed suicide, one during the index illness, the others between three and twelve years later.

Self-harm Because non-fatal self-harm is a more common event, particularly in young women, more cases can be expected in following up postnatal women than is the case with suicide. Two studies have examined self-harm in women following childbirth, but each has begun with a selected study population, likely to be at higher risk, rather than all postnatal women: women refused abortion in one study, and teenage mothers in the other.

In the follow-up of 249 Swedish women refused an abortion in 1948, Hook (1963) found that only two had carried out an act of self-harm during the subsequent 7 - 12 years. The

timing of these events is not given.

Gabrielson et al. (1970) followed women who gave birth under the age of eighteen in New Haven during 1959 and 1960, including in the report only the 105 patients on whom follow-up information was available for at least two years (the number thus excluded is not given). In that time fourteen patients were regarded as having made a suicide attempt, although this included two subjects who had talked about suicide without acting. This "suicide attempt" group was more likely to be single, Roman Catholic and living in a poor area, and to have had complications during pregnancy and venereal disease since delivery.

Of the twelve women who actually carried out a self-harming action, only one did so during the first year after the index birth, but two more were in the first year following a subsequent delivery - in one case this occurred after the second child, in the other it followed the seventh. Two of these three postnatal parasuicides were teenagers (aged eighteen) at the time of the self-harm, while the other was twenty-three. The method of self-harm was overdose in two cases, and jumping from a height in one case.

Gabrielson et al. (1970) estimated that this cohort had a risk of parasuicide ten times the expected rate, according

to figures on self-harm by U.S. young women. However, this refers to the medium term risk in teenage mothers, and gives little impression of the rate in the postnatal period.

3.3.2 Evidence from suicidal and self-harming populations

Studies of suicide have not focused specifically on postnatal women. Barraclough et al. (1974), for example, reported that twenty of their 100 suicides were parents but did not specify the age of the children.

Only two studies of female parasuicide have recorded how many subjects had recently delivered babies. In one, a study of the relationship between parasuicide and the menstrual cycle, two of 107 consecutive cases of deliberate self-harm were noted to be amenorrhoeic following childbirth (Birtchnell & Floyd 1974). In an earlier study of 100 U.S. women imprisoned on charges of attempted suicide, five had recently delivered - in four cases the babies were known to be 6 - 12 weeks old (Epps 1957). The diagnoses in this study were chronic schizophrenia, neurotic depression (2 cases), and psychopathy (2 cases). Clearly these findings may give little indication of the risk or features of postnatal parasuicide following the abolition of the law against parasuicide.

3.4 SUICIDE AND SELF-HARM IN PREGNANT WOMEN

3.4.1 Evidence from pregnant populations

Suicide For the reasons outlined in section 3.3.1 on postnatal suicide, little evidence on the rate of suicide in pregnant women can be obtained from prospective studies of childbearing women such as those of Kumar and Robson (1984) or Watson et al. (1984). Similarly, studies of admissions during pregnancy and postnatally, such as those of Kendell et al. (1987), do not contain data on suicides. Information must therefore come from large studies of pregnant women or from studies of suicides or self-harming individuals in which pregnancy is noted.

Barno (1967), in recording maternal suicides over a sixteen year period in Minnesota, found only four pregnant cases, and calculated a rate of suicide in pregnant women of 1 per 325,436 live births, a very low rate even for the female population. All four were in the second trimester of pregnancy, and all were thought (after retrospective examination of medical notes) to be suffering from psychotic depression. Unlike those of the postnatal suicides in this study (see above), their methods were less violent and more passive, perhaps indicating less psychiatric disturbance: two died by overdose, one by

asphyxiation with carbon monoxide, and one by jumping from a height. Barno, in commenting on these results, expressed the view that "the foetus *in utero* must be a protective mechanism".

However, this calculation, like that in postnatal women, was not standardised for age, and the same criticism can be levelled at the only comparable British estimate, which appeared in Kleiner and Greston (1984) as part of a commentary on the study of Barno (1967). This estimate used the number of suicides listed in the *Report on Confidential Enquiries into Maternal Deaths in England and Wales* for the nine year period 1967 - 1975 and calculated a rate of 1 suicide per 370,956 maternities, i.e. live births plus stillbirths (Kleiner & Greston 1984). This figure, although remarkably similar to that of Barno, is likely to be an underestimate, as women who died by suicide but received an open verdict at coroner's inquest were not included. Nevertheless, these two calculations suggest a low rate of suicide in pregnant women.

Self-harm Only one study has recorded acts of self-harm by women who were pregnant at the time, and the population studied - women refused a termination - can not be regarded as typical of pregnant women (Hook 1963). Of 249 women in the study, only 2 carried out acts of self-harm during the pregnancy.

3.4.2. Evidence from suicidal and self-harming populations

Suicide In some reports of suicide it is possible to calculate the number of pregnant women in the study samples. Seagar and Flood (1965), for example, found that three (2.7%) of 112 female suicides in Bristol were pregnant. Heller and Whittington (1968) refer to thirty-eight female suicides, none of whom was pregnant. These figures are low compared to the earlier results reviewed by McClure (1971), from nine studies around the world, seven published before 1936. Of 685 suicides in women of childbearing age, McClure calculated that ninety-three (13.5%) were pregnant.

Two further reports from developing countries offer different results. Of forty-three female suicides in a two year period in Fiji, all dying by hanging, two were known to be pregnant (Price & Karim 1975). In Kenya, Ribeiro (1962) collected post mortem reports of twenty-two fatal self-burnings by Hindu women, and found that two were pregnant (and nineteen menstruating). These studies are not calculations of suicide rates as they take no account of the number of pregnant women in the population or their ages in comparison to all women. Because they are suicides by a single method, they appear to be highly selected samples of suicides in their respective countries, and

Price and Karim note that the Fijian sample is incomplete.

Only one study has set out specifically to study suicide by pregnant women (Weir 1984). This study identified all suicides, including likely suicides receiving open verdicts, in London during the twenty years 1943 - 1962 in women aged 15-49 years. Of 1,696 probable or definite suicides, sixty-six (3.9%) were pregnant. Compared to a sample of non-pregnant female suicides in the same age range, the pregnant suicides were less likely to have had a psychiatric history. Suicide methods were mainly overdose and coal gas poisoning in both groups.

However, although this study did compare its subjects to a control population in the same age range, the figures are not age-standardised, and it is therefore difficult to say whether the figure of 3.9% is high or low.

Self-harm Eight studies have examined samples of self-harming patients and determined the proportion of pregnant women among them, and their results have been broadly similar, suggesting that a significant minority of women who harm themselves are pregnant.

Four of these studies were carried out in the U.K.. Sclare and Hamilton (1963) reported five (4.9%) pregnant women in 102 self-harming women of all ages in Glasgow during 1960 -

1962. Burke (1968) found seven pregnant women (12%) in sample of fifty-eight women of childbearing age. All were in the first four months of pregnancy, and "most" were young and unmarried. Similarly, Birtchnell and Floyd (1974; 1975) found thirteen (12%) women who were pregnant (or thought they were pregnant) in 107 female parasuicides, compared to three pregnant women in a control group. The pregnant parasuicides were young, single, and more likely to express a wish to die than other parasuicides.

A higher figure was found by Burke (1976) among West Indian parasuicides in Birmingham. Nine of forty-five (20%) females were pregnant, and these were likely to be single and aged 15-24 years.

In a U.S. study of reasons for parasuicide by adolescents, based on family interviews, Jacobziner (1965) reported that in 6.4% of female cases, families blamed illegitimate pregnancy. Among the 100 imprisoned U.S. parasuicides in the study by Epps (1957) quoted earlier, eight (8%) were pregnant. One further U.S. study examined telephone contacts with a metropolitan poison centre during a four-year period, finding that 0.07% were pregnant women who had taken overdoses (Rayburn et al. 1984). This low figure is difficult to interpret, however, because it appears to be calculated using a denominator of all telephone contacts, rather than deliberate self-poisonings. In addition,

telephone contacts may not be representative of all self-poisoning individuals.

Three Australian studies have calculated that 11% (Boxall 1966), 7.6% (James 1963), and 6.2% (Whitlock & Edwards 1968) of female parasuicides were pregnant. The study by Whitlock and Edwards (1968) in Brisbane collected data on a one year sample of parasuicides. Thirty of 483 were pregnant, and these authors believed that this prevalence (6.2%) was no different from that of pregnant women in the general female population. The two groups did not differ significantly on a number of demographic and psychosocial features, except that the pregnant group was slightly younger - in the absence of a comparison with non-parasuicides it is not possible to know whether this difference was a feature of pregnant parasuicides or merely of pregnant women compared to non-pregnant women. The pregnant women usually harmed themselves impulsively, often following interpersonal crises, though these were not necessarily related to the pregnancy itself. Many had a background of social and personal adversity.

Excluding the study of Rayburn et al. (1984) because of its concentration on telephone contacts, the remaining studies have given a range of 4.9% to 20% for the proportion of parasuicides who are pregnant, although with one exception they have all presented figures of 12% or less. The

characteristics they have described as associated with pregnant women who harm themselves are the features of self-harm itself: being young and being single, and in most cases the total numbers have been too small to allow more detailed study of risk factors.

But is the risk they have reported high or low? Only one study (Birtchnell & Floyd 1975) compared its parasuicides to a control group to find out if pregnant women were over-represented, and even this comparison was not age-standardised. The numbers described were small, but the study concluded that there was an excess of pregnant women among parasuicides.

One further doubt concerns the confirmation of pregnancy. In most studies this was based on retrospective examination of case-notes. The possibility remains that some women did not reveal, or were not asked, about pregnancy, and also that some women who were in early pregnancy were not aware of this. Again, the study of Birtchnell & Floyd (1974; 1975) was most likely to be accurate on this point, as it was primarily a study of the relationship between parasuicide and menstruation and a menstrual history was taken in all cases.

Two further studies examined not the number of pregnant women among parasuicide samples but only their

characteristics. Lester and Beck (1988) compared fifteen pregnant parasuicides with a group of 131 controls, and then with an individually matched control sample. The pregnant parasuicides scored the same as controls on measures of depression, hopelessness and suicidal intent. However, they were more likely to know someone who had carried out an act of self-harm. A much larger but uncontrolled sample of 209 pregnant overdoses reported that 13% blamed an unwanted pregnancy for their self-harm or requested termination of pregnancy (Czeizel & Lendvay 1989).

3.5 SUMMARY AND CONCLUSIONS

The following conclusions can be drawn from these studies and are relevant to the experimental work described in the following chapters:

1 Previous research on suicide and self-harm in pregnant and postnatal women has in general been methodologically flawed, while well-conducted studies on postnatal disorders or suicide have provided little information on this subject.

2 In particular, most studies have failed to compare their rates of self-harm in childbearing women, or conversely their rates of childbearing in self-harming women, to equivalent rates in control populations. When comparisons have been made, these have not been age-standardised, although rates of suicide, parasuicide and childbirth are all influenced - and in different directions - by age.

3 Many of the studies are old, and were carried out when family planning and abortion were more difficult to obtain, and when unmarried pregnancy was more socially unacceptable. Some were conducted when attempted suicide could lead to prosecution. Their findings, even when supported by acceptable experimental methods, may now be

out of date.

4 One U.S. population study has offered the best, if now old, estimate of suicide rates in pregnant and postnatal women (Barno 1967). It suggested that both are low, but it may have underestimated postnatal suicides and its comparison with the general female population took no account of age. Its postnatal suicides were suffering from psychotic illness, according to a later casenote review, although no diagnostic criteria were specified, and no definitions of depressive psychosis or schizophrenia were given. Studies of maternal mortality generally have reported few suicides but a Swedish report (Hogberg et al. 1994) suggested that suicide was a major cause of maternal death after the puerperium. Postnatal suicides were associated with violent methods.

5 Similarly, a calculation of rates in England and Wales (Kleiner & Greston 1984) reported a low rate of suicide in pregnant women. But it omitted open verdicts, and made no comparison with an age-standardised population. The study by Weir (1984) of pregnant suicides in London suggested that few were psychotic in comparison to all female suicides (and in contrast to findings on postnatal suicides).

6 Studies of parasuicide report rates of pregnancy of 5-

20%. Only one includes a control population of non-parasuicides, and this reports that the parasuicide rate in pregnancy is high. There are no satisfactory studies of parasuicide in postnatal women.

7 Individual or cognitive mechanisms by which childbearing might influence suicidal and self-harming behaviour have not been investigated.

The aim of this study was as follows:

1. To calculate the standardized mortality ratio (SMR) for suicide by women during the first postnatal year.

2. To identify the characteristics of postnatal suicides including timing, risk factors and relationship to marital status.

CHAPTER FOUR

STUDY 1:

SUICIDE IN THE FIRST POSTNATAL YEAR

4.1 AIMS

The aims of this study were as follows:

1 to calculate the standardised mortality ratio for suicide by women during the first postnatal year

2 to identify the characteristics of postnatal suicides, including timing, method of suicide, and relationship to marital status

4.2 METHOD

4.2.1 Sources of Data

The calculation used the following data sources:

Cause of death Mortality statistics for England and Wales are reported annually by the Office of Population Censuses and Surveys (HMSO, annual publication). The total number of deaths is given for each cause and is further subdivided by sex and age in five year age bands. In this study data were extracted for women aged 15-19, 20-24, 25-29, 30-34, 35-39, and 40-44 - the age range of the most likely reproductive years - for the twelve year period 1973-84, corresponding to the period of the *Confidential Enquiry* for which clinical information was available (see below). Two categories of cause of death were included: (1) suicide and self-inflicted injury, and (2) external cause, cause undetermined. The latter category corresponds to open verdicts at coroner's inquest and is used when suicide is the most probable cause of death but the evidence is considered insufficient. It is therefore preferable and conventional to include such cases in statistical and clinical studies.

Population size The Office of Population Censuses and

Surveys also publishes annual estimates of the population in England and Wales, subdivided by age and sex (HMSO, annual publication). These are mid-year estimates to the nearest hundred individuals, initially projections based on the previous decennial census but modified following the subsequent census. A breakdown of these figures according to marital status is also available. In this study figures were extracted for women in the same five-year age bands during the years 1973-84.

Birth statistics The number of births in England and Wales each year is similarly reported in a publication by the Office of Population Censuses and Surveys (HMSO, annual publication). Total births are divided into live births and stillbirths, and both are reported according to maternal age. Both live births and stillbirths are also presented according to the marital status of the mother, i.e. legitimate and illegitimate. Actual numbers rather than estimates are presented, although the figures showing age distribution also include an estimated distribution of mothers whose age was not notified to O.P.C.S.. In this study numbers of both live births and stillbirths to women in the same five-year age bands during the period 1973-84 were used in calculations.

Maternal deaths During the study period 1973-84 the Department of Health and Social Security collected

information on all deaths known to have occurred in women who were pregnant or who had delivered a baby during the previous year. This information was published in triennial documents entitled *Report on Confidential Enquiries into Maternal Deaths in England and Wales* and known by the abbreviated term *Confidential Enquiry* (DHSS, annual publication). The *Confidential Enquiry* actually began in 1952 but did not collect deaths by suicide comprehensively until the late 1960s. In addition to the figures published in each *Confidential Enquiry* Report, the Department of Health collected social and clinical data which were not published. At the time of conducting this study, such data had been retained for the years 1973 - 1984 (although the *Confidential Enquiry* has continued after these dates), and these were made available to the study.

The data collection system required coroners and District Health Authority public health physicians to pass on initial details of maternal deaths to the Department of Health who then, through regional representatives, collected further information.

Data available in *Confidential Enquiry* reports include information on specific cases such as age, marital status, timing of death in relation to pregnancy or childbirth, cause of death, coroner's verdict, and relevant social and clinical details, including whether the baby was born live

or dead. Deaths are also ascribed to one of three categories according to the presumed relationship with pregnancy or childbirth, the categories being direct (e.g. eclampsia), indirect (e.g. diabetic ketoacidosis) and fortuitous (e.g. road traffic accident). In this study deaths listed as suicide or receiving an open verdict at coroner's inquest were included. Open verdicts in coroners' courts approximate closely to deaths from external cause, cause undetermined in OPCS records. The unpublished information about individual cases of suicide and death from undetermined cause, made available by the Department of Health, included psychiatric information.

In the following calculation the number of suicides refers to the total number of suicides plus deaths from cause undetermined in the case of OPCS data, or suicides plus open verdicts in the case of *Confidential Enquiry* data.

4.2.2 Method of Standardisation

The following calculation was carried out for each five-year age band and, separately, for each three-year period in order to study the effect of age and detect any variations with time. A separate calculation was carried out for unmarried women and for women after stillbirth.

Expected suicide rate in postnatal women According to the null hypothesis, the expected rate of suicide in the first postnatal year would be identical to the observed rate in non-postnatal women. This was estimated by first calculating the number of non-postnatal women in the population as follows:

No. of women - no.of births ,

and entering this figure into the following equation:

No. of female suicides / No. of non-postnatal women ?
? years.

Expected number of suicides in the first postnatal year

The expected rate of suicide was then used to calculate the expected number of suicides as follows:

Expected rate x total number of births

Separate calculations were carried out for stillbirths and illegitimate births.

Calculation of mortality ratios

For each five-year age band and, separately, for each three-year time period, mortality ratios were calculated

from the equation:

Observed number of suicides / Expected number of suicides

where the observed number of suicides was obtained from the report of maternal deaths in the *Confidential Enquiry*, as described above.

95% confidence intervals were calculated according to the formula of Breslow and Day (1987).

Standardised mortality ratios (SMRs) are often expressed in relation to the numerical standard 100, and this practice has been continued in this study. The results of the above ratio calculations are multiplied by 100 to give final SMRs.

4.2.3 Method of Suicide

The methods of self-harm used by postnatal suicides, according to the *Confidential Enquiry*, were entered into observed to expected ratios. The expected figures were obtained from those published by OPCS on methods of suicide and deaths from undetermined external cause among women for the years 1974-1984, there being no such detailed information (on sub-categories of method of self-harm)

published in 1973. All ages between 15 and 44 years were grouped together. Suicides by burning and by jumping in front of a train were listed individually from 1979, and the expected figures for these methods were therefore based on female suicides aged 15-44 years in the period 1979-1984.

4.3 RESULTS

4.3.1 Number of cases entering study

The number of cases of possible suicide reported to the *Confidential Enquiry* for each 3-year period is shown in Table 4.1. In total there were 79 cases reported after childbirth and 2 further cases reported after legal abortion.

Seventy-eight inquests were held on the 79 postnatal cases. The remaining case was of a 25-year-old single woman who died 115 days after delivering a live full-term infant. The *Confidential Enquiry* recorded that she was suffering from "puerperal depression" and that she died of an "accidental (?) overdose". However, metabolic acidosis was given as the cause of death on the death certificate. No other details were available to the study.

There were 2 cases of accidental death recorded at inquest. The first was a 24-year old married woman who died 255 days after delivering a live full-term infant. The cause of death was given as an accidental overdose of dothiepin. Although the woman was receiving treatment for postnatal depression at the time of her death, the coroner concluded that she had not killed herself but had had an abnormal

reaction to the antidepressant. The second case of accidental death was a 28-year-old married woman who died 108 days after delivering a live full-term infant. She was similarly receiving treatment for postnatal depression and the cause of death was drowning in a bath.

There were 4 verdicts of death by misadventure. The first of these concerned a 19-year-old married woman who delivered stillborn twins at full gestational term and who died 19 days later following haemorrhagic complications of an overdose of unspecified kind. There was no noted psychiatric illness. The second was a 22-year-old woman who died 143 days after a full-term live birth. She was receiving treatment for puerperal depression at the time and died by taking an unspecified overdose. The third was a 32-year-old married woman who died 224 days after delivering a live baby at full term. Death was caused by injuries sustained after a fall from a bridge. No psychiatric disorder was noted. The fourth was a 32-year-old married woman who died 27 days after delivering a live infant at full term. Puerperal depression had been noted after a previous child but not at this time. Death was by an unspecified overdose.

Many of these cases of death by accident and misadventure are likely to have been suicides, according to the limited clinical details outlined above. It is conventional in

studies of suicide to accept cases that at coroner's inquest have received a verdict of suicide and most or all of those receiving an open verdict. In this study the case on which no inquest was held and the two cases of accidental death were excluded, while the four cases of death by misadventure were included as their details strongly suggested that they were suicides, as well as all open verdicts and cases recorded as suicide. The two cases of death following abortion were excluded.

The inclusion of four cases of misadventure was intended to ensure that all likely postnatal suicides appeared in the numerator figure when the mortality ratio was calculated. The numerator therefore consisted of all women dying in the first postnatal year, according to the *Confidential Enquiry*, whose verdict at inquest was suicide, open or misadventure. As all were likely suicides, this figure represents the best estimate of the total number of suicides in postnatal women. The denominator in the mortality ratio was based on the number of females whose cause of death was recorded as suicide or external cause, cause undetermined. This figure, although derived in a different way from the numerator, similarly represents the best estimate of the number of non-postnatal suicides.

In total, therefore, 76 cases from the *Confidential Enquiry* during the years 1973-84 were accepted as suicides for the

purpose of the study. Table 1 shows that at inquest 56 of these were recorded as suicide, 16 as open verdicts, and 4 as death by misadventure.

4.3.2 Description of the subject sample

The mean age of the sample was 26.5 years, with a range of 17-41 years. Fifty-nine (77.6%) were noted to be married, 11 (14.5%) single, 4 (5.3%) separated and 2 (2.6%) divorced. Racial origin was generally not recorded but 7 subjects were noted to be of Asian origin.

Table 4.1

Number of postnatal cases reported to each triennial *Confidential Enquiry*, inquest verdicts and number entering the study

Year	Post-natal cases	Sui.	Open	Misad.	Acc.	None	Study cases
1973-75	13	12	0	0	1	0	12
1976-78	26	18	5	3	0	0	26
1979-81	21	12	8	0	0	1	20
1982-84	19	14	3	1	1	0	18
Total	79	56	16	4	2	1	76

4.3.3 Suicide rate in postnatal women

During the twelve year period 1973 - 1984, there were in total 7,542,740 births in England and Wales. The rate of suicide was therefore 10.1 per million (or 1 per 100,000) births.

4.3.4 Mortality Ratios

Table 4.2 demonstrates the calculation of mortality ratios for each three-year time period. The observed number of suicides varied by a factor of more than two between the first two periods. The expected number of suicides in young women was reasonably stable over time. The mortality ratio, i.e. the ratio of observed:expected suicide numbers, therefore varied by a factor of more than two across the four time periods, the lowest ratio (0.12) being found in 1973-75 and the highest (0.23) in 1976-78. However, a test for heterogeneity (result given with Table 4.2) showed the differences not to be statistically significant.

Table 4.3 demonstrates the calculation of mortality ratios for each 5-year age band. There was a large variation in observed number of suicides with age. Similarly, there was a large variation in the expected number, reflecting the

influence of age on both the birth rate and the suicide rate. The mortality ratio was therefore noticeably stable across the age bands with the exception of the 15 - 19 year olds. In this age group the mortality ratio (0.36) was almost twice the next highest ratio (0.19 in the 20 - 24 year old age group). However, a test for heterogeneity showed the difference not to be statistically significant (result given with Table 4.3)

Because the variation in mortality ratios over time and with age was non-significant, figures were combined to give an overall mortality ratio, and this was multiplied by 100 to give the SMR as described above. The sum of the expected numbers of suicides in the first postnatal year was 450. The observed number was 76. The SMR after a live birth was found to be 17 (95% confidence interval 14 - 21), i.e. the number and rate were approximately one sixth of the expected figure.

Table 4.2

Observed and expected numbers of postnatal suicides and mortality ratios, by 3 - year time period.

	1973-75	1976-78	1979-81	1982-84	Total
Observed	12	26	20	18	76
Expected	109.1	113.3	120.5	106.6	449.6
O:E ratio	0.11	0.23	0.17	0.17	<u>0.17</u>

Test for heterogeneity: $\chi^2 = 4.7$, $df = 3$, $p > 0.1$

(Apparent arithmetical inaccuracies arise from rounding errors)

Table 4.3

Observed and expected numbers of postnatal suicides, by 5-year age band.

	15-19	20-24	25-29	30-34	35-39	40-44	Total
Obs.	7	24	25	13	6	1	76
Exp.	19.6	127.6	165.9	92.3	35.8	8.37	449.6
O:E ratio	0.36	0.19	0.15	0.14	0.17	0.12	<u>0.17</u>

Test for heterogeneity: $\chi^2 = 5.3$, $df = 5$, $p = 0.4$

(Apparent arithmetical inaccuracies arise from rounding errors)

4.3.5 Timing of postnatal suicides

Figure 4.1 and Table 4.4 show the timing of seventy-five of the seventy-six suicides in relation to childbirth (in one case the timing of suicide was not given). The horizontal axis of figure 4.1 represents the first postnatal year divided into thirteen four-week months.

The mean number of suicides per month during the first postnatal year was 5.8 (75/13). The age-standardised monthly mean for women who were not postnatal, i.e. the expected mean, was 34.6 (450/13). There was an obvious variation with time: a large peak occurred in the first postnatal month (18 suicides), followed by a smaller rise (11 suicides) at around five months, but both peaks were well below the expected number. Towards the end of the year the number was approximately one-tenth of the expected number at 2-3 per month, and the low figure was still evident, with no sign of a return to the expected number, at the end of the year. The monthly variation in O:E ratios was highly significant (see Table 4.4).

Figure 4.1 **Timing of postnatal suicides in relation to childbirth**

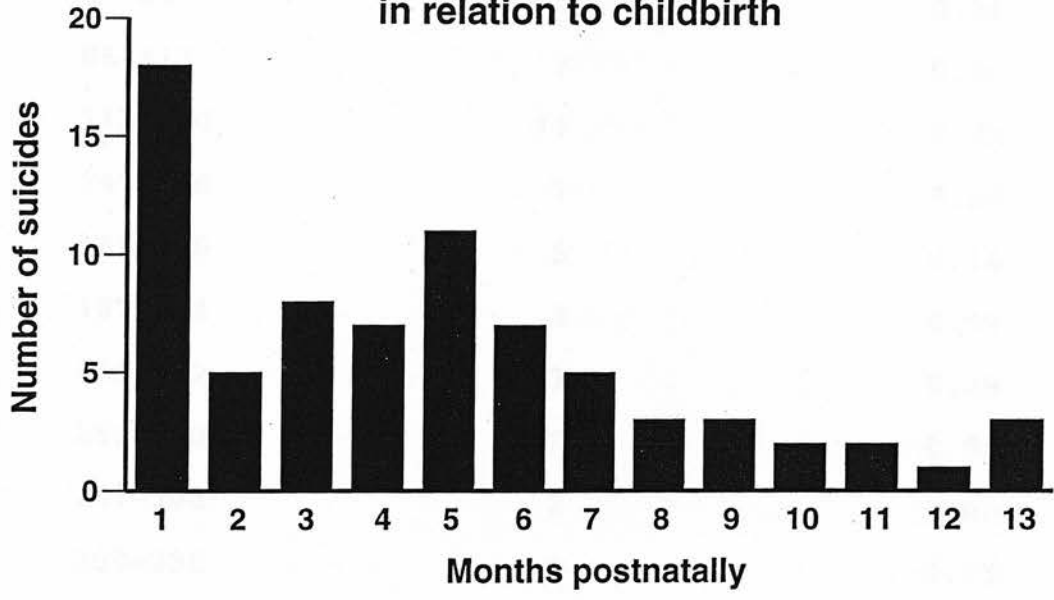


Table 4.4

Timing of postnatal suicides in relation to childbirth

<u>No. of days postnatal</u>	<u>No. of suicides</u>	<u>O:E ratio</u>
1-28	18	0.52
29-56	5	0.14
57-84	8	0.26
85-112	7	0.20
113-140	11	0.32
141-168	7	0.20
169-196	5	0.14
197-224	3	0.09
225-252	3	0.09
253-280	2	0.06
281-308	2	0.06
309-336	1	0.03
337-364	3	0.09

Expected monthly figure = 34.6

Test for heterogeneity of O:E ratios:

$$x^2 = 42.96, \quad df = 12, \quad p < 0.001$$

4.3.6 Timing in the puerperium

Figure 4.2 and Table 4.5 give the timing of suicides in the puerperium more precisely. Figure 4.2 shows the distribution of puerperal deaths according to the week in which they occurred. Table 4.5 similarly gives the number of deaths in each puerperal week. The expected number in each week, derived from the non-postnatal age-matched female population was 8.65 (450/52). As suggested by Figure 4.2 and Table 4.5, the number of suicides declines after the first postnatal month. During the puerperium, the peak weekly number of suicides (6) occurred in weeks one and four when the observed:expected ratio was 0.58 and 0.69, considerably higher than the figure of 0.17 obtained for the year as a whole. A test for heterogeneity shows that the variation in observed:expected ratios during the first postnatal month itself was not significant.

One suicide occurred on the day of delivery. The cause of death was a head injury resulting from a fall from a hospital window. The woman was known to have received psychiatric treatment during pregnancy but no details of her illness or treatment were recorded by the *Confidential Enquiry*. An open verdict was recorded.

Another occurred on the day of discharge from the maternity

unit, on the 10th day following delivery. The cause of death was multiple injuries resulting from a fall from a bridge. The woman had been seen by a psychiatrist because of puerperal depression but no other details were recorded by the *Confidential Enquiry*. A verdict of suicide was recorded.

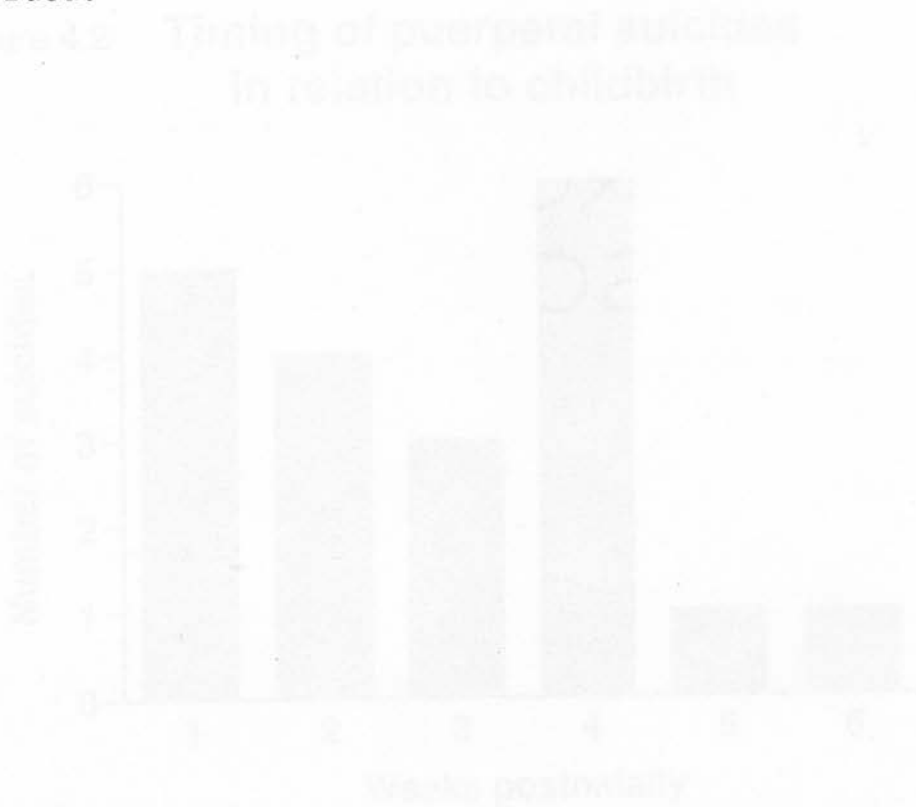


Figure 4.2 **Timing of puerperal suicides in relation to childbirth**

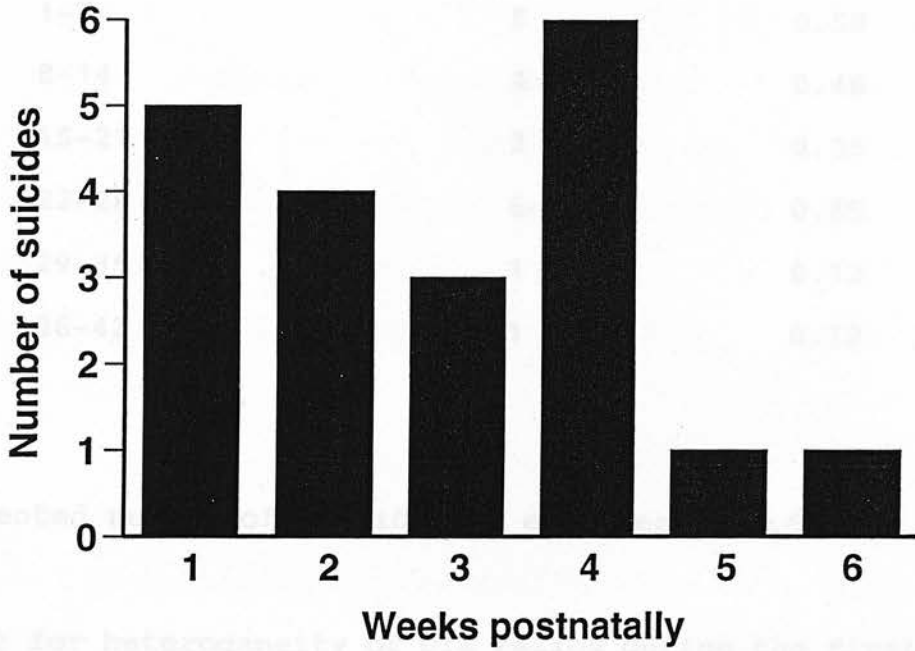


Table 4.5

Timing of puerperal suicides in relation to childbirth

<u>No. of days postnatally</u>	<u>No. of suicides</u>	<u>O:E ratio</u>
1-7	5	0.58
8-14	4	0.46
15-21	3	0.35
22-28	6	0.69
29-35	1	0.12
36-42	1	0.12

Expected number of suicides in each week = 8.65

Test for heterogeneity of O:E ratios during the first four postnatal weeks:

$$\chi^2 = 1.11, \quad df=3, \quad p > 0.05.$$

4.3.7 Method of Suicide

Tables 4.6a and 4.6b show the methods of suicide used by postnatal women compared to all women, according to national figures on mortality obtained from OPCS data. As described above, the OPCS data used for comparison were obtained for the years 1974-84, excluding 1973 when published details on mortality did not include the sub-categories of methods of suicide relevant to this study. The national figures for death by jumping in front of a moving object and for death by self-immolation refer to the years 1979-84, 1979 being the first year when these specific causes were separately listed.

It can be seen that the relative frequencies of suicidal methods used by postnatal women differed from those of all women. Postnatal women were more likely to use "active" or violent methods such as self-incineration (O:E ratio = 4.0), jumping from a height (O:E ratio = 2.5), or jumping in front of a train (O:E ratio = 2.1), and less likely to use self-poisoning (O:E ratio = 0.8), the principal "passive" method of suicide in the United Kingdom. Because the numbers are small, the confidence intervals are wide; nevertheless, the excess of suicides by self-incineration and jumping from a height was statistically significant.

Table 4.6a

Methods of suicide in women of all ages, 1974 - 1984

Method	Nos., 1974-84 *	Nos., 1979-84 **
All methods	7,333	4,038
Self-poisoning	4,005	
Car exhaust fumes	330	
Hanging	748	
Drowning	553	
Jumping (building)	419	
Other	1089	
Jumping (moving object)		176
Burning		119

* Methods categorised in this way from 1974

** These two methods listed separately from 1979

Table 4.6b

Methods of suicide among 76 women in the first postnatal year

Method	Observed	Expected	O:E Ratio	95% C.I.
Overdose	32	41.5	0.8	0.5 - 1.1
Other poisoning	1	3.4	0.3	0.01 - 1.6
Hanging	8	7.8	1.0	0.4 - 2.0
Drowning	8	5.7	1.4	0.6 - 2.8
Jumping (height)	11	4.3	2.5	1.3 - 4.6
Jumping (train)	7	3.3	2.1	0.8 - 4.4
Burning	9	2.2	4.0	1.8 - 7.8

Confidence intervals are obtained from tables of means of Poisson distribution

Figure 4.3 shows the proportion of suicides in each month in which a violent method was used. Violent methods of suicide have been reported to be more common in those with a history of major psychiatric disorder; major psychiatric illness tends to occur early in the postnatal period. Figure 4.3 shows the relative frequency of violent methods of suicide changes a little with time during the first postnatal year, but the difference was not significant. In particular, the methods used in the first postnatal month, when psychosis is at its peak, were no more likely to be violent than those used in the second half of the year.

Thirty-two of the thirty-three poisonings were by overdose, although the drug used in overdose was noted in none of the cases. In two, it was recorded that alcohol had also been taken. There was one case of self-poisoning that was not an overdose and in this case the substance taken was ammonia. There was no case of carbon monoxide poisoning. One death was recorded as resulting from overdose and drowning in a canal. Because the latter seemed more likely to be the immediate cause of death, this case is included in these data as a drowning.

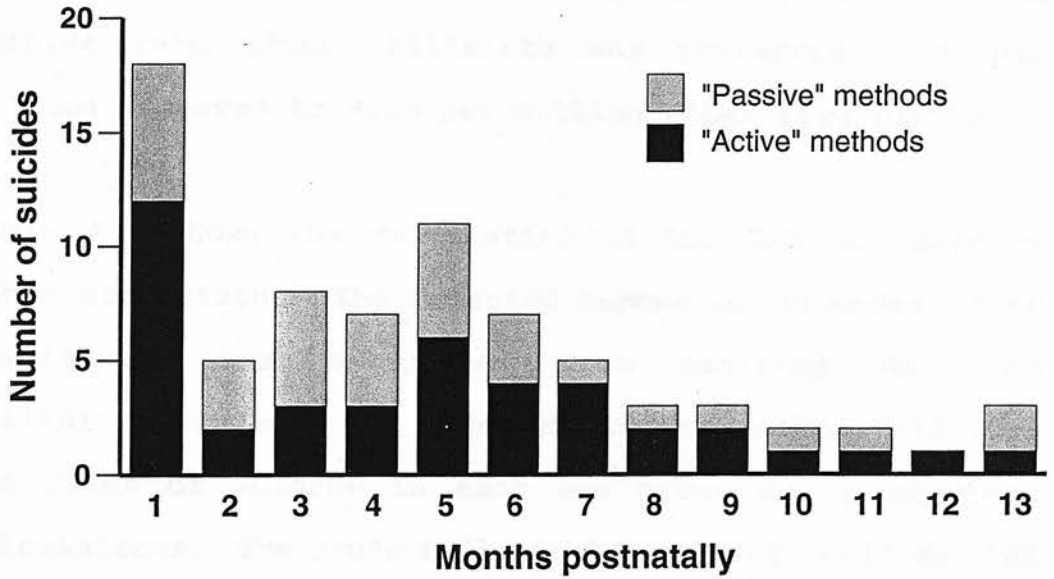
Four of the seven women noted to be of Asian origin died by self-immolation. These four represent almost half (44%) of

all suicides by burning in the study sample. In four of these nine cases the substance used was paraffin; in three the substance was petrol. In the remaining two it was not noted.

Figure 15. Proportion of "active" or violent postnatal suicides, by time after childbirth.



Figure 4.3 Proportion of "active" or violent postnatal suicides, by time after childbirth



4.3.8 Stillbirths

Four of the women in the sample had had a stillbirth. From national data on births and stillbirths (HMSO, annual publication), it was possible to calculate the expected number of stillbirths in 76 births to be 0.62. In the twelve years of the study, there were 62,715 stillbirths and 7,480,025 live births in England and Wales. The suicide rate after stillbirth was therefore 63.8 per million compared to 9.63 per million after live births.

Table 4.7 shows the calculation of the SMR for suicide after stillbirth. The expected number of suicides after stillbirths was calculated from national data on stillbirths in each age group during the years 1973-1984 and rates of suicide in each age group as in previous calculations. The crude (all ages) mortality ratio was 105 (95% confidence interval 39 - 279).

The confidence interval shows that women after stillbirth have a rate of suicide that is not significantly different to that of all women. By the best estimate of suicide SMR after stillbirth (105), the risk of suicide after stillbirth is six times the rate in all women after childbirth (SMR 17). Two of the four suicides after stillbirth were in the 20-24 years age group, and there was

wide variation in the O:E ratios with the highest ratio once again in the 15-19 years age group, but a test for heterogeneity showed no effect of age.

Of the four stillbirths that preceded suicide, two followed concealed pregnancies and one of these births was unattended. Only two of the four pregnancies went to term, the others lasting 34 and 36 weeks. All four suicides took place within the puerperium, two within one week of delivery. The precise timing of these suicides was 3, 7, 19 and 33 days postnatally. In all four cases this had been the woman's first child.

In addition, two suicides followed neonatal deaths. One of these, described as an early neonatal death, occurred after an extremely premature live birth - although the exact duration of gestation was unknown, it was estimated to be "23 weeks plus". The other followed a cot death 4 weeks postnatally. One suicide occurred within the puerperium, in the sixth postnatal week. The other occurred in the fourth postnatal month. In one case, this had been the woman's first child. In the other, there was one older child.

Table 4.7

**Observed and expected numbers of suicides after stillbirth,
by age**

	15-19	20-24	25-29	30-34	35-39	40-44	Total
Obs.	1	2	0	1	0	0	4
Exp.	0.19	1.02	1.24	0.75	0.44	0.17	3.8
O:E ratio	5.3	1.96	0	1.33	0	0.79	1.05

SMR for suicide after stillbirth = $1.05 \times 100 = 105$.

Test for heterogeneity: $\chi^2 = 6$, $df = 5$, $p > 0.1$

(Apparent arithmetical errors arise from rounding errors)

4.3.9 Marital Status

The marital status of the 76 suicides, according to the *Confidential Enquiry*, was as follows: 59 married, 11 single, 4 separated, 2 divorced. Combining the last three groups, therefore, gives a total of 17 (22%) unmarried.

The mortality ratios for suicide by unmarried women in each five-year age band are shown in Table 4.8. The overall mortality ratio (all ages) was 40 (95% confidence interval 25 - 64). The rate of suicide in unmarried mothers was therefore less than half that in the general female population but more than twice that in all women after childbirth. A low mortality ratio was found in each age band. Mortality ratios for unmarried women between the ages of 15 and 24 were higher than for women 25 years and over but the difference was not significant.

Table 4.8

Observed and expected numbers by unmarried women in the first postnatal depression

	15-19	20-24	25-29	30-34	35-39	40-44	Total
Obs.	3	7	3	2	1	1	17
Exp.	7.3	16.2	9.6	5.6	3.2	0.9	42.8
O:E ratio	0.41	0.43	0.31	0.36	0.32	1.06	0.40

Mortality ratio = $0.40 \times 100 = 40$

(Apparent arithmetical errors are due to rounding errors)

4.3.10 Parity

38 women (50%) committed suicide after delivering their first child. 19 suicides (25%) occurred after the delivery of a second child, and 15 (20%) after a third. In one case, the woman had given birth to her fifth child. In three cases the parity was not stated in the *Confidential Enquiry* information.

4.3.11 Psychiatric History

The *Confidential Enquiry* recorded a past or current psychiatric disorder in 49 of the 76 cases (64%). Details were inconsistently recorded, and the definition of psychiatric disorder is likely to have varied between inquests. This overall figure was therefore comparatively crude and the accuracy of further analysis of psychiatric data is uncertain.

The commonest broad diagnosis was depression and this was noted to have been present before death in 27 cases. In a further two cases a past but not recent history of depression was noted. A further two women were noted to have been suffering from manic depressive psychosis, although whether they were depressed or manic at the time of death was not specified. 31 women were therefore known to have had an affective disorder that can be assumed to have been present at the time of suicide. This figure was 41% of the total sample and 63% of those with a definite psychiatric history.

One woman was said to have been suffering from schizophrenia. Three were described as having puerperal psychosis. A further 11 women in the sample were noted to have had a history of psychiatric disorder or treatment,

with no further details. One woman was said to be anxious about her impending divorce at the time of suicide but it was not clear whether she was suffering from an anxiety disorder or another condition.

In addition, the suicides of three women with no known psychiatric history were described as "related to pregnancy". This expression implies postnatal psychiatric disorder, and was used in other cases in which psychiatric illness was also noted.

Five patients (7%) were noted to have carried out an act of self-harm previously. In two cases this was the only psychiatric history noted and both had had multiple episodes of self-harm. Of the remaining 3 cases, 2 had taken overdoses in the recent past. One of these had done so at an unspecified time before delivery, and committed suicide, also by overdose, 3 days after delivery. The other committed suicide by self-immolation in the fourth postnatal month having taken an overdose in the sixth postnatal week.

Two patients were addicted to heroin. One of these was known to have been depressed at the time of suicide.

The location of care at the time of death was inconsistently noted. Five patients were noted to have

been treated as in-patients before death and in three of these it was stated that death occurred after discharge to out-patient care. In the other two, both in-patient and out-patient care had been given but it was not clear which was occurring at the time of suicide. In no case was it specified that death occurred while the woman was an in-patient.

In one further case, it was noted that treatment had been reduced before death. However, no other details are given on the adequacy of treatment or compliance with treatment in those cases in whom a psychiatric disorder was recognised.

A summary of those with a confirmed psychiatric history is given in Table 4.9.

Table 4.9

Summary of known past or current psychiatric disorder in 76 postnatal suicides

<u>Disorder</u>	<u>Number (%)</u>
Affective disorder	31 (41)
Schizophrenia	1 (1)
Heroin addiction only	1 (1)
"Puerperal psychosis"	3 (4)
Unspecified	11 (14)
Past self-harm only	2 (3)
<u>Total</u>	<u>49 (64)</u>

4.3.12 Infanticide SUMMARY BY FINDINGS

Four women who committed suicide (5% of the subjects) were noted also to have killed their babies. Three of these women died by drowning, the other by burning. Two of the four died during the puerperium. One woman who killed her baby and committed suicide was also pregnant at the time of death.

The low rate appeared to be related to the delivery of a live child in that it was not noted among stillbirths (1908-1919). The period of highest suicide during the first postnatal year was the first postnatal month. Postnatal suicides were more likely to have been carried out by violent methods, particularly self-incineration and hanging from a height. 40% per cent were associated with infanticide, a history of psychiatric illness was common.

The possible explanation for these findings are discussed in section 4. The low rate of postnatal suicide was in contrast to the high rate of suicide in the first year of life. The high rate of suicide in the first year of life is probably due to the fact that the first year of life is a period of high risk for suicide. The high rate of suicide in the first year of life is probably due to the fact that the first year of life is a period of high risk for suicide. The high rate of suicide in the first year of life is probably due to the fact that the first year of life is a period of high risk for suicide.

4.4 SUMMARY OF FINDINGS

The principal result of this study is the low rate of suicide in women during the first postnatal year despite a high rate of psychiatric morbidity at this time. The SMR for suicide by postnatal women was calculated to be 17, i.e. the actual number was one-sixth of the expected number. The low rate appeared to be related to the delivery of a live child in that it was not found after stillbirth (SMR = 105). The period of maximum risk during the first postnatal year was the first postnatal month. Postnatal suicides were more likely to have been carried out by violent methods, particularly self-incineration and jumping from a height. Five per cent were associated with infanticide. A history of psychiatric illness was common.

The possible explanations for these findings are discussed in section 6. One possible conclusion for the low rate of suicide is that a rational awareness of being needed by a dependent baby exerts a protective influence on postnatal women, including those who are psychiatrically ill and who might otherwise be suicidal. Some of the features of postnatal suicide, such as the timing and methods of most suicides, suggest that many of those who do commit suicide are women with psychosis rather than non-psychotic postnatal illness. This supports the idea of a protective

awareness of being needed because such a rational belief should be most disrupted by psychotic illness, placing psychotic women at greater risk of suicide. Similarly, any protective effect of motherhood on women with psychiatric disorder may therefore be most associated with postnatal depression. Such an effect should also be found in other, equivalent populations, such as pregnant women.

CHAPTER FIVE

The principal aim of this study was to extend the findings of Study 1 by calculating the age-standardized and age-specific rates for suicide in pregnant women. The specific hypothesis was that the rate would be lower than in postnatal women, reflecting the low rate of pregnancy in general women. The study also aimed to identify the characteristics of

CHAPTER FIVE

STUDY 2:

SUICIDE DURING PREGNANCY

5.1 AIMS AND HYPOTHESIS

The principal aim of this study was to extend the findings of Study 1 by calculating the age-standardised mortality ratio for suicide in pregnant women. The specific hypothesis was that the ratio would be lower than in postnatal women, reflecting the low rate of psychosis in pregnant women. The study also aimed to identify the characteristics of pregnant suicides.

5.2 METHOD

Mortality ratios for suicide in pregnant women were calculated using the same sources of data as those in Study 1. These are summarised below:

5.2.1 Sources of data

Cause of death Mortality statistics for England and Wales were obtained from the Office of Population Censuses and Surveys (HMSO, annual publication) for the twelve-year period 1973-84, corresponding to the period of the *Confidential Enquiry*. Figures for two causes of death were included in the study: (1) suicide and self-inflicted injury, and (2) external cause, cause undetermined. Data for women aged 15-19, 20-24, 25-29, 30-34, 35-39 and 40-44 years were used in the calculation.

Population size OPCS figures for the size of the female population in England and Wales during the years 1973-84 were obtained (HMSO, annual publication), broken down into five-year age bands as above. Information on marital status was also available.

Number of pregnant women The number of pregnant women annually in England and Wales during the period 1973-84 was

obtained from OPCS (annual publication), broken down into the same five-year age-bands. In this calculation, the number of conceptions leading to birth was used as the most accurate estimate of the number of pregnant women, rather than the number of births. This was because the number of conceptions is derived from the number of births, taking into account the fact that a conception may have taken place in the year prior to birth. Figures on conception are a better estimate, therefore, of the number of pregnant women in a particular year. Conceptions are officially divided into those that lead to maternity and those that lead to abortion, and in this study the figures used were of the number of conceptions leading to maternity. Marital status was also recorded.

However, these annual figures can not be used unmodified in the calculation because the duration of pregnancy is less than one year. Birth statistics reveal how many pregnancies lead to a delivery, whether live birth or stillbirth. They can therefore be used to indicate how many women are in the first postnatal year, as in Study 1; they can also indicate how many women were pregnant during the previous year, excluding miscarriages and abortions. However, to use birth statistics unmodified in this study would estimate the risk of suicide in the year before childbirth, rather than during pregnancy. This would have the effect of falsely lowering the suicide rate if pregnant

suicides, rather than suicides in the antenatal year were used as the numerator.

The denominator, the number of pregnant women, must therefore take into account the duration of pregnancy, and the annual conception numbers must be adjusted accordingly. One way of doing this would be to multiply the conception figures by 40/52, thereby adjusting for the 40 weeks of a pregnancy. However, this study was conducted to test the hypothesis that an awareness of pregnancy, not pregnancy itself, would be protective against suicide. The adjustment to the birth figures should therefore take into account how long a women is aware of her pregnancy, and in this study this was assumed to be 34 weeks. The denominator figure in the ratio was therefore obtained by multiplying conception figures by 34/52.

No additional adjustment was made to take into account pregnancies that did not reach 28 weeks, as national data do not specify the length of pregnancy prior to termination.

Deaths during pregnancy The *Confidential Enquiry* included deaths in pregnancy and collected the information listed in the method section of study 1, including some demographic and psychiatric data and certain details of deaths. As in Study 1, this study examined unpublished information about individual cases of suicides and deaths receiving an open

verdict at inquest, made available by the Department of Health. As before, the term "suicide" is used to include open verdicts or deaths from cause undetermined.

5.2.2 Method of standardisation

The calculation of expected numbers of suicide in pregnancy was carried out as in the case of women in the first postnatal year. This is described in detail in the first method section and summarised below. The calculation was made for each five-year age band as before.

a) Expected suicide rate in pregnant women:

$$\frac{\text{No. of female suicides}}{\text{No. of non-pregnant women}}$$

where the number of non-pregnant women was the total number of women minus the number of conceptions in a year.

b) Expected number of suicides in pregnant women:

$$\text{Expected rate} \times \text{no. of conceptions} \times 34/52$$

5.2.3 Calculation of mortality ratios

For each five-year age band, mortality ratios were calculated from the equation:

$$\text{Expected no. of suicides} / \text{Observed no. of suicides}$$

where the observed number was taken from the Confidential Enquiry.

95% confidence intervals were calculated according to the formula of Breslow and Day (1987). The ratios obtained by the calculation above were multiplied by 100 to give final SMRs.

5.2.4 Additional information about pregnant suicides

Additional information available from the Confidential Enquiry included parity, marital status, psychiatric history and method of suicide.

5.3 RESULTS

5.3.1 Suicide rate in pregnancy

There were fourteen suicides by pregnant women in the twelve year study period, and 7,480,025 live births. The rate of suicide in pregnancy, expressed in relation to live births (i.e. rather than conceptions, as rates of medical events in childbearing women are usually calculated in relation to live births), was therefore 1.87 per million (or 0.19 per 100,000) live births.

5.3.2 Mortality ratios

Table 5.1 demonstrates the calculation of mortality ratios for each five-year age band. The sum of the expected numbers of suicides in pregnant women was 282 while the observed number was 14. The crude (all ages) SMR for suicide by pregnant women was therefore 5 (95% confidence interval 2.9 - 8.4), i.e. the number and rate were one-twentieth of the expected figures.

Table 5.1 also shows a test for heterogeneity carried out on the age-specific ratios. There is a highly significant

effect of age, with teenage women showing a higher mortality ratio than women in all older age groups. Although the ratio in pregnant teenage women (28) indicates that their risk of suicide is approximately a quarter of that in all teenage women, it is nevertheless several times higher than the ratio in older women.

	15-19	20-24	25-29	30-34	35-39	40-44
Observed	2	3	4	2	9	3
Expected	11.5	46.7	107.3	51.8	12.9	6.7
OR Ratio	0.17	0.06	0.04	0.04	0.7	0.4

Test for heterogeneity: $\chi^2 = 70.35$, $df = 5$, $p < 0.001$

Table 5.1

Observed and expected numbers of suicides in pregnant women, by age

	15-19	20-24	25-29	30-34	35-39	40-44
Observed	5	3	4	2	0	0
Expected	17.4	88.0	101.7	51.4	18.8	4.2
O:E Ratio	0.28	0.03	0.04	0.04	0	0

Test for heterogeneity : $\chi^2 = 20.35$, $df = 5$, $p = 0.001$

5.3.3 Timing of suicide

Two (14%) of the pregnant suicides occurred during the first trimester, 8 (57%) during the second trimester and 4 (29%) during the third trimester. All but 3 suicides, i.e. 79%, occurred between weeks 14 and 29 of pregnancy. Of the 5 teenage suicides, 3 died in the second trimester and 2 in the third trimester.

5.3.4 Method of suicide

The methods used by the 14 women who committed suicide while pregnant were as follows. Seven (50%) died by overdose, the commonest method of suicide in women aged 15-44 and in the population as a whole during the years 1973-84. Two died by falling from buildings, and two by asphyxiation with car exhaust fumes. There was one death by hanging, one by burning, and one by electrocution. In contrast to what was found in postnatal women, therefore, a minority of suicides - 5 (36%) - were by active or violent methods. Of the five teenage women 3 (60%) died by overdose. Both women who died after falling from buildings were teenagers.

5.3.5 Parity

Eleven of the women (79%) were in their first pregnancy, while 2 (14%) were in their second pregnancy and 1 (7%) was in her third pregnancy. All five teenage women were in their first pregnancy.

5.3.6 Marital status

Five of the women (36%) were single, 1 (14%) was separated and 8 (57%) were married. Of the five teenage women 4 (80%) were single.

5.3.7 Psychiatric history

Seven (50%) of the 14 pregnant suicides had no psychiatric history, according to information obtained by the Confidential Enquiry. Seven (50%) had a psychiatric history, though few additional details were available. In one case the subject was an in-patient on a psychiatric ward at the time of her death by hanging. In another case the subject, whose death occurred at 25 weeks' gestation, had been a psychiatric in-patient earlier in the course of her pregnancy. No other case included information on how recently psychiatric illness had been evident. Although

two subjects were described as having a long psychiatric history, which could be taken as implying chronicity, one of these - whose illness was described as depression - was not noted to have depressive symptoms before death. In one case the psychiatric disorder was drug dependence.

In five cases the suicide was said to be "unrelated to pregnancy", though this was not explained further. Four of these were women with a psychiatric history. Two subjects were noted to have concealed their pregnancies before death, and in one of these the suicide was said to be "related to pregnancy" (no other case was described in this way). In one case legal abortion had been refused and suicide occurred at 16 weeks' gestation. One subject was in her fifth postnatal month and also 14 weeks pregnant (this case is also included in the data in study 1).

In summary, 3 (21%) of 14 pregnant suicides appear to have killed themselves after being unhappy about being pregnant, i.e. 2 concealed pregnancies and 1 refused termination. None of these had a psychiatric history. All 3 were in the age group 15-19 years. Of the remaining 11, 7 had a psychiatric history; 4 of these suicides were said to be unrelated to pregnancy, implying that suicide occurred in the context of psychiatric disorder *despite* pregnancy.

5.4 SUMMARY OF FINDINGS

The principal finding of this study was a low rate of suicide in pregnant women. This finding supports the main hypothesis of the study. The SMR was 5, i.e. the actual number of suicides was only one twentieth of the expected number. There was a significant effect of age in that teenage women, although their risk of suicide was less than that expected, were found to be at higher risk than older pregnant women relative to age-matched women. A psychiatric history was common. The number of pregnant women was too small to allow detailed study of other characteristics.

The principal aim of this study was to identify the frequency of parasuicide in the first postnatal year and to determine whether women in the first postnatal year have a higher rate of self-harm. Although parasuicide has been reported in different populations, their populations are different. The social risk factors are similar, and hence the prevalence of parasuicide in the first postnatal year is expected to be high.

CHAPTER SIX

STUDY 3:

PARASUICIDE IN THE FIRST POSTNATAL YEAR

The second aim of the study was to identify the frequency of parasuicide in the first postnatal year.

6.1 AIMS AND HYPOTHESIS

The principal aim of this study was to extend the findings of studies 1 and 2 to non-fatal self-harm by determining whether women in the first postnatal year have a low rate of self-harm. Although suicide and parasuicide are different phenomena, their populations overlap: in women, social risk factors are similar, and people who have carried out an act of non-fatal self-harm are at high risk of subsequent suicide. As there are no national data on parasuicide, the study population was that of a single catchment area. Specifically, the study tested the hypothesis that the rate of parasuicide in the first postnatal year would be low.

The second aim of the study was to identify characteristics of parasuicide in the first postnatal year.

6.2 METHOD

6.2.1 Sources of Data

As there are no national data on parasuicide, the study was carried out in a single hospital catchment area, Camberwell Health Authority in south-east London, which is served by King's College Hospital. The following sources of data were used:

Numbers of postnatal and non-postnatal women The office of Population Censuses and Surveys and the Information Officers of Camberwell Health Authority provided population data for the catchment area of King's College Hospital, London for 1990. This included the number of women in each five-year age band between 15-44 years and the number of births in each group. The latter figures provided the best estimate of the number of women who were in their first postnatal year during the study period, and by subtracting this from the total female population, the number who were not in the first postnatal year was obtained.

Number of postnatal and non-postnatal parasuicides Information was collected on a consecutive six-month (November 1990 - April 1991) sample of women between 15-44 presenting to King's College Hospital as a result of

parasuicide. This information included age, address, childbirth within the last year, and method of parasuicide.

The main sources of information were the women themselves, their Casualty records or other current hospital files. Most information was routinely obtained as part of a parasuicide service in the hospital. Patients who had been admitted to hospital following an episode of parasuicide were assessed clinically and the information listed above was recorded along with other clinical and social data. When patients had not been admitted or had been discharged before they could be asked to provide information, their Casualty records were used as the source of information. Where necessary this was supplemented by specific enquiry to a subject's GP. The name and address of the GP was usually recorded on the Casualty record; when this was not the case, the Southwark Family Health Service Authority was asked to identify the patient's GP.

Women living outside the hospital catchment area and those of no fixed abode were excluded, as the calculations were based on catchment area data only, and the population data referred to the Camberwell district alone.

6.2.2 Calculation of odds ratio for parasuicide in postnatal women

Figures from the above sources were used to calculate age-specific rates of postnatal and non-postnatal suicide. These were entered into the Mantel-Haenszel summary estimate (Breslow and Day 1987) to give an odds ratio for parasuicide in women who were postnatal (in comparison to non-postnatal women). In the terms often used in calculating an odds ratio, the "event" under study was parasuicide and the "exposure" was childbirth within the previous year.

6.3 RESULTS

6.3.1 Description of subject sample

A total of 132 female parasuicides aged 15-44 years attending King's College Hospital Casualty Department during the study period were eligible for inclusion, i.e. they lived in the hospital catchment area. Four cases of no fixed abode were excluded from the study; none of these four had had a baby in the previous year. In only one case was the information obtained from all sources on current living circumstances and family size regarded as inadequate for the purposes of the study. In this case, the patient gave little information to Casualty staff, was not admitted and was found not to be registered with a general practitioner.

Of the remaining 131 subjects, 5 (3.8%) had delivered a baby in the last 12 months. Table 6.1 shows the number of parasuicides in each five year age band, divided according to whether or not they were known to be in their first postnatal year.

Table 6.1

Parasuicides by postnatal and all women, population and births, by age

Age (years)	No. female parasuicides	No. postnatal parasuicides	Female Population	No. of births
15-19	20	0	7,344	243
20-24	37	2	10,391	941
25-29	27	2	10,588	1,399
30-34	22	1	8,528	992
35-39	14	0	7,001	361
40-44	11	0	7,189	55

6.3.2 Odds ratio of postnatal to non-postnatal parasuicide

The crude (ie. all ages) rates of parasuicide were found to be 2.57 per thousand non-postnatal women and 1.25 per thousand postnatal women. There was no significant effect of age on the difference between postnatal and non-postnatal rates. The Mantel-Haenszel summary estimate was calculated from age-specific rates. The ratio for postnatal : non-postnatal parasuicide was calculated to be 0.43 (95% confidence interval 0.17 - 0.95), i.e. the rate of parasuicide in postnatal women was less than half that in women who were not postnatal.

6.3.3 Timing of parasuicide

The timing of the five episodes of parasuicide after childbirth were 2 weeks, 3 months (two cases), 8 months and 11 months. In addition there were three episodes of parasuicide after termination of pregnancy, occurring at 3 months, 9 months and 10 months after termination.

6.3.4 Method of parasuicide

The methods of self-harm used by the five parasuicidal

subjects were overdose in 4 cases (80%) and stabbing in 1 case (20%). In the 126 non-postnatal parasuicides, there were 110 (87.3%) cases of overdose alone, nine (7.1%) episodes of self-cutting alone, and three (2.3%) cases of both overdose and self-cutting. In four cases (3.2%) the method of overdose was not noted.

6.3.5 Marital status

Of the five postnatal parasuicides, two were married or cohabiting, one was single, one divorced, and there was one case in which marital status was not noted. Of the 126 non-postnatal parasuicides, 28 (22.2%) were married or cohabiting, 68 (54.0%) were single, 10 (7.9%) were separated or divorced, and in 20 cases (15.9%) marital status was not noted.

6.3.6 Older children

None of the postnatal parasuicides had any older children. Forty (31.7%) non-postnatal cases had children older than one year, fifty-nine (46.8%) had no children, and in 27 cases (21.4%) the number of older children was not stated.

6.4 SUMMARY OF FINDINGS

The principal finding of this study was a low rate of parasuicide in women in the first postnatal year. The risk of self-harm in postnatal women was less than half that in age-matched non-postnatal women. 3.8% of the parasuicides were postnatal, a little less than the range of 4.9 - 20% found in the earlier review of pregnant parasuicides. Although the small number of cases makes further analysis difficult, there was no evidence of an association with age. There was no clustering in the first postnatal month, though the majority occurred within the first three months. Methods of parasuicide were mainly overdose in both postnatal women and non-postnatal women, but the only case of violent self-harm was among the postnatal group. Other characteristics were not different in the two groups.

The results extend the findings of Studies 1 and 2, and suggest that women in the first postnatal year are protected from non-fatal as well as fatal self-harm.

This study examined the cognitive coping styles of women with postnatal depression. It was hypothesized that women with depression would report more negative coping styles and more postnatal depression symptoms than women without depression. The results of the study supported these hypotheses.

CHAPTER SEVEN

STUDY 4:

SUICIDE-RELATED COGNITIONS IN

POSTNATAL DEPRESSION

7.1 AIMS AND HYPOTHESIS

This study examined the cognitive coping style of women with postnatal depression, in comparison to women with depression arising at other times. Specifically, the study tested the hypothesis that suicide-related cognitions would differ in the two groups, in that women whose depression arose postnatally would report more self-worth and optimism, and less likelihood of carrying out a self-harming action when distressed.

7.2 METHOD

7.2.1 Subjects

The study subject sample was recruited from individuals who were assessed psychiatrically as part of a treatment trial in postnatal depression.

The Manchester Postnatal Depression Treatment Trial This trial was conducted in Manchester, in the catchment area of South Manchester Health Authority. From June 1993 all women delivering a baby in one of the two maternity units in south Manchester were approached before discharge from hospital (i.e. during the first few days postnatally) and asked to agree to be screened for the presence of depression six weeks later. Screening took place in the patients' homes using the Edinburgh Postnatal Depression Scale (EPDS) (Cox et al. 1987), a ten item questionnaire designed to detect symptoms related to depressed mood as it affects women who have young babies. Scores for each item are based on the presence, frequency and severity of symptoms, each item carrying a maximum score of 3. The maximum score on the EPDS as a whole is therefore 30. In screening for postnatal depression, the threshold for possible "caseness" is usually taken as 9/10 or 12/13. At the lower threshold, the specificity is 82% and the

sensitivity is 89%; at the higher threshold, the figures are 98% and 68% (Murray & Carothers 1990). The EPDS is included in the Appendix.

In this trial the presence of postnatal depression was confirmed using the Revised Clinical Interview Schedule (CIS-R) (Lewis et al. 1992). The original Clinical Interview Schedule (Goldberg et al. 1971) was designed to detect psychiatric morbidity, predominantly non-psychotic, in community studies, and it has been widely used in psychiatric studies of general practice and general hospital populations. The CIS-R enquires about a number of non-psychotic symptoms, attaching a score to each based on its presence and severity during the previous week. A score of 13 or above is thought to indicate clinically significant morbidity. Although the instrument does not on its own indicate a specific diagnosis, the symptoms reported can be used as the basis of a clinical diagnosis. Alternatively, diagnostic criteria can be applied to the information obtained at interview. The CIS-R is included in the Appendix.

Because of this trial a large number of women suffering from postnatal depression have been detected and offered a combination of the antidepressant fluoxetine or placebo and a form of counselling based on cognitive therapy.

Sampling procedure For approximately four months during the first year of the trial, women who were confirmed on the CIS-R to be suffering from clinically significant morbidity, and who were judged at the time of interview to be depressed, were recruited to the present study, whether or not they agreed to take part in the treatment trial. They therefore represent an unselected consecutive sample of women with postnatal depression. They did not necessarily satisfy diagnostic criteria for depression but all had scored in the clinically significant range on the CIS-R and had been judged to be significantly depressed.

Comparison sample The comparison sample consisted of women with depression who did not have a child under the age of one year. They were recruited from patients of Withington Hospital Department of Psychiatry, Manchester, who had received a clinical diagnosis of non-psychotic depressive illness. In-patients, day patients and out-patients were included, and most were patients of the author. Patients who were psychotic, or in whom there was prominent disturbance of personality or behaviour (including repeated self-harm threats or actions), were not included. The recruitment period was the same four-month period during which cases of postnatal depression were also recruited.

7.2.2 Methods of assessment

Psychiatric Morbidity As described above, all postnatal patients in this study had been interviewed using the CIS-R, which had been used to confirm significant morbidity (a score of 13 or above) and had allowed the interviewer to confirm a clinical diagnosis of depression. In order to compare the two groups on severity of depression, the non-postnatal group was also interviewed using the CIS-R. A score was obtained and a clinical diagnosis was made. The interviews were conducted by the same research worker.

Suicide-Related Cognitions Postnatal subjects and non-postnatal controls were asked to complete a questionnaire on "coping style". This was constructed by the author for a separate study of parasuicide repetition, and was intended to elucidate patterns of thinking and likely behaviour in individuals who are prone to self-harm. These patients may be particularly vulnerable to repeated self-harm - for example, in response to life events - because of certain cognitive and behavioural characteristics. Firstly, they may respond to life stresses with more thoughts of low self-worth and pessimism. Secondly, in the absence of more adaptive coping strategies, they may see self-harm as the best or only way of expressing distress. Thirdly, they may feel resentful against hospital services

for failing, in their view, to provide adequate help at times of distress - this perceived rejection would act as a further stress, confirming poor self-worth and perpetuating these maladaptive patterns of cognition and behaviour.

The "coping styles questionnaire" used in this study was designed to reveal the presence and intensity of such feelings, on the assumption that, having been acknowledged by the patient and also measured, they could then become the target of therapeutic intervention designed to interrupt this spiral of distorted cognitions and self-harm. It consists of ten items, each of which is given in the form of a first-person statement, e.g. "I am at least as good as the next person". Respondents are asked to record their agreement or disagreement with each statement by ticking one of four boxes, corresponding to "strongly disagree", "disagree", "agree", and "strongly agree". Some statements are worded positively, e.g. "I can think of someone who needs me", while others are worded negatively, e.g. "I will never be able to stop feeling upset".

The statements can be divided into two broad groups. Numbers 1-5 are intended to represent the cognitive component of self-harm. Numbers 6-10 are intended to represent the behavioural component, although these too are cognitive in that they are thoughts about behaviour -

clearly, the questionnaire can not measure actual behaviour. The cognitive items concern self-worth and optimism:

1. I am at least as good as the next person.
2. I will never be able to stop feeling upset.
3. I can think of someone who needs me.
4. Any problems I have will be solved in the end.
5. No-one really cares for me.

The behavioural items concern actions that can be taken in response to life stresses:

6. Taking an overdose or harming myself is sometimes the only way out of my problems.
7. I am able to cope with most problems.
8. Taking an overdose or harming myself is a good way of showing people how upset I am.
9. Talking about my problems helps.

10. Hospitals have a duty to look after me when I am
upset.

The scoring of each item of the questionnaire ranges from 0 to 2, higher scores being given to more maladaptive responses. In the case of positively worded statements, this means that the answer "disagree" receives a score of 1, while "strongly disagree" is scored 2. Both "agree" and "strongly agree" are scored 0. In the case of negatively worded statements, the scoring pattern is reversed.

Information given to patients about the completion of the questionnaire consists of the following paragraph at the top of the questionnaire:

Below is a series of statements about attitudes to problems and how to solve them. Please complete the questionnaire by filling in the box which corresponds most closely to your opinion. The questionnaire asks you to say how strongly you agree with each statement. The questionnaire is seeking your opinions - but there are no right or wrong answers.

The actual coping styles questionnaire is given in the Appendix. The questionnaire has not previously been used

in any study of self-harming behaviour or attitudes. Its reliability and validity have not therefore been established. These are described to some extent in the results section of this study and discussed in Chapter Eight.

7.2.3 Statistical analysis

Test-Retest Reliability A sub-sample of the postnatal women were given the coping styles questionnaire for a second time after an interval of 4-6 weeks. Paired sample t-tests were used to examine the test-retest reliability of scores.

Differences between groups Total scores on the CIS-R were compared between the two groups using the Mann-Whitney U Test, the scores in the non-postnatal group not following normal distribution. Similarly, scores on the coping styles questionnaire did not follow normal distribution, and the Mann-Whitney U Test was used to compare the two groups. The distribution of scores on individual items on the coping styles questionnaire (0,1 or 2) were compared using the chi square test.

7.3 RESULTS

7.3.1 Subjects

47 postnatally depressed women and 20 depressed women who were not postnatal completed the coping styles questionnaire. There were no refusals in either group. The postnatal group were significantly younger: the mean age of the postnatal group being 29 years, the mean age of the non-postnatal group being 44 years (Mann Whitney U test, $p < 0.01$). They were also more likely to be married ($\chi^2 = 6.1$, $df = 2$, $p = 0.046$). There were no differences between the groups on race, employment status or partner's employment status.

7.3.2 Test-retest reliability of coping styles questionnaire

21 of the postnatally depressed women completed the questionnaire for a second time 4-6 weeks later. Among these 21, the mean total score was 0.81 (SD = 1.32) on the first occasion, and 0.57 (SD = 0.87) on the second occasion. The median score on both occasions was 0. A paired samples t-test showed no significant difference between scores obtained on the two occasions, both on

individual item scores and on the total questionnaire score (difference between the overall means = -0.24, SE = 0.19, $t = -1.2$, 2-tailed significance: $p = 0.23$).

Because these patients were being assessed as part of a separate treatment trial, scores on the Edinburgh Postnatal Depression Scale were also available. On the first occasion, the mean EPDS score in the 21 patients was 7.7 (SD = 3.1); on the second occasion it was 4.4 (SD = 3.4). A paired samples t-test carried out on total EPDS scores showed the difference between the two occasions to be highly significant (difference between the means = 3.4, SE = 0.78, $t = 4.4$, 2-tailed significance: $p < 0.001$). Thus the questionnaire showed good test-retest reliability despite an apparent fall in depressive symptoms. CIS-R scores were not available for the second testing occasion.

7.3.3 Psychiatric morbidity

The mean (first occasion) CIS-R score in the 47 postnatally depressed women was 28.4 (SD = 7.2). The mean CIS-R score in the 20 control depressed women was 28.7 (SD = 5.7). The distribution of scores in the non-postnatal group was not normal, and a Mann Whitney U test confirmed that the difference between the groups was insignificant. There was

no difference in the proportion of cases of major depression (DSM IV criteria) in the two groups ($\chi^2 = 0.09$, $df = 1$, $p = 0.76$)

7.3.4 Scores on the coping styles questionnaire among women with postnatal depression and non-postnatal depression

The mean score on the coping styles questionnaire in the postnatal group was 2.19 (SD = 2.25). The mean score in the non-postnatal group was 4.15 (SD = 3.86), indicating more distorted cognitions. The scores were not normally distributed and a Mann Whitney U test showed the difference between the groups to be statistically significant ($p < 0.05$). The distribution of total questionnaire scores is shown in Figure 7.1.

Mean scores in the two groups on individual items of the coping styles questionnaire are shown in Table 7.1. On 8 of the 10 items, the non-postnatal group scored more highly, the exceptions being "Taking an overdose or harming myself is a good way of showing people how upset I am" and "Hospitals have a duty to look after me when I am upset". These were the two items that were expected to be poorly discriminating in this study because they are intended to represent cognitions of help-seeking in people who

repeatedly harm themselves. On these 2 items, the postnatal women scored more highly but the numerical difference between the two groups was very small.

In contrast, the non-postnatal group scored more highly on the other 8 items, and the numerical differences were larger. On two items, presented in bold type in Table 7.1, the difference between the two groups was statistically significant at the 0.05 level on a chi square test applied to the distribution of scores between 0, 1 and 2. These items were "Any problems I have will be solved in the end" ($\chi^2 = 9.1$, $df = 2$, $p = 0.01$) and "Taking an overdose or harming myself is sometimes the only way out of my problems" ($\chi^2 = 9.0$, $df = 2$, $p = 0.01$).

There were also three items on which the difference was significant at the 0.1 level. These were "I am at least as good as the next person" ($\chi^2 = 5.0$, $df = 2$, $p = 0.08$), "I will never be able to stop feeling upset" ($\chi^2 = 5.5$, $df = 2$, $p = 0.06$), and "I can think of someone who needs me" ($\chi^2 = 5.2$, $df = 2$, $p = 0.07$).

Figure 7.1 **Distribution of scores on coping styles questionnaire in women with postnatal and non-postnatal depression**

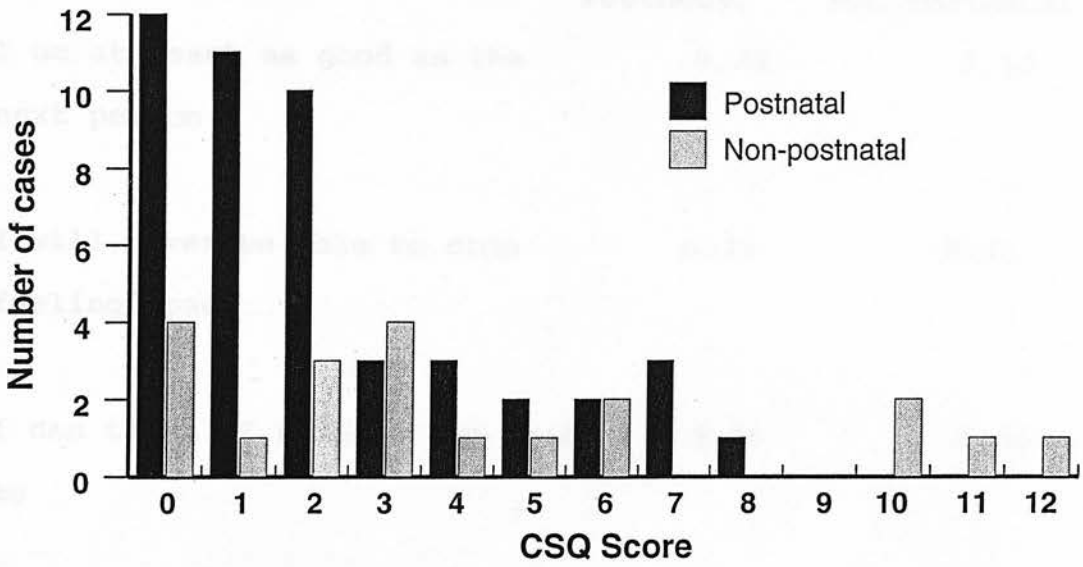


Table 7.1

Mean scores on individual items of the coping styles questionnaire in postnatal depression and non-postnatal depression

	Postnatal	Non-postnatal
I am at least as good as the next person	0.28	0.63
I will never be able to stop feeling upset	0.23	0.50
I can think of someone who needs me	0.06	0.30
Any problems I have will be solved in the end	0.19	0.60
No-one really cares for me	0.23	0.35

Table 7.1 (cont.)

	Postnatal	Non-postnatal
Taking an overdose or harming myself is sometimes the only way out of my problems	0.11	0.50
I am able to cope with most problems	0.40	0.50
Taking an overdose or harming myself is a good way of showing people how upset I am	0.17	0.15
Talking about my problems helps	0.15	0.30
Hospitals have a duty to look after me when I am upset	0.36	0.35

7.3.5 Scores on coping styles questionnaire among married and unmarried women

These results were explored further by examining for the possible influence of being married. The same sixty-seven subjects were divided according to whether they were married or not. Women were regarded as married if they were co-habiting; any other marital status - single, separated, or divorced - was included in the unmarried group. Fifty of the total sample were married and seventeen were unmarried.

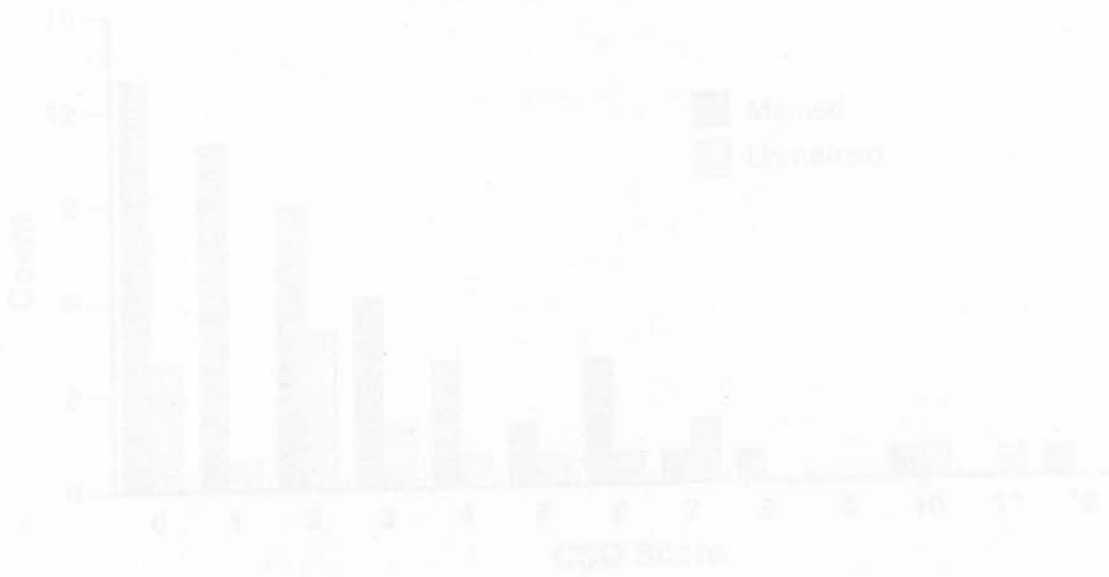
Because the same patients were re-allocated to new groups, and because the postnatal women were likely to appear mainly in the married group, this could not be regarded as a test of coping cognitions in unselected married and unmarried women. However, it could be seen as a test of whether any difference between postnatal and non-postnatal women would be increased, decreased, or abolished when allocation to groups was made according to the related characteristic of marital status.

The mean total scores on the coping styles questionnaire were 2.68 (SD = 2.51) in the married group and 3.94 (2.83) in the unmarried group. Figure 7.2 shows the distribution of total scores in the two groups. A Mann Whitney U test

showed that on total scores the difference between the groups failed to reach statistical significance ($p > 0.1$)

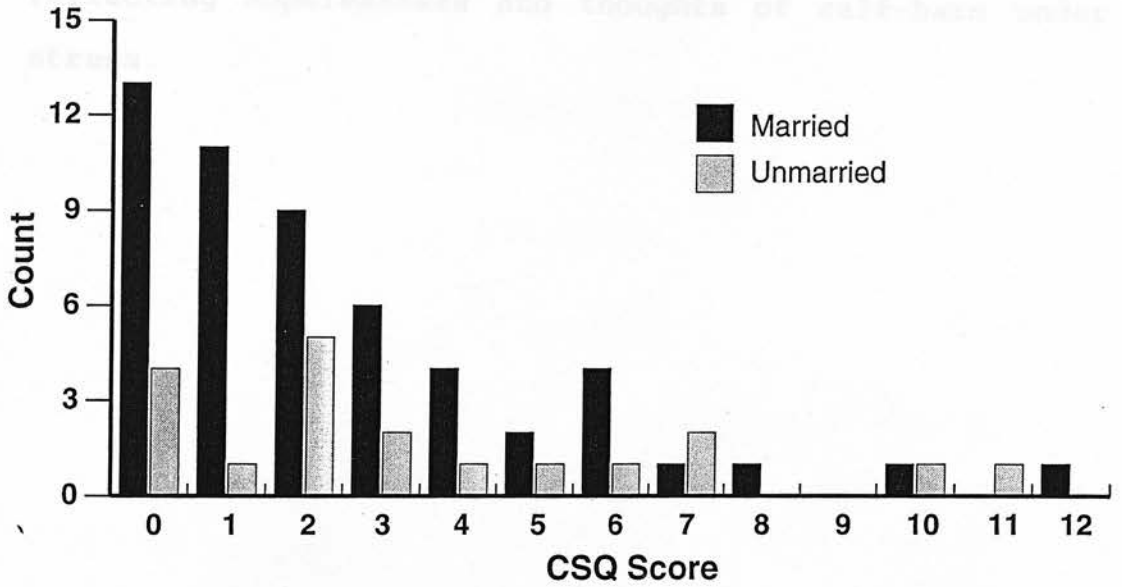
The unmarried group scored significantly more highly than the married group on one individual item. This was "I can think of someone who needs me" ($\chi^2 = 7.2$, $df = 2$, $p = 0.03$).

Distribution of scores on coping styles questionnaire in married and unmarried women



The principal result of this study was that women with postnatal depression scored less highly on a questionnaire of "suicide-related cognitions" than women with depression who were not in the first trimester of pregnancy.

Figure 7.2 **Distribution of scores on coping styles questionnaire in married and unmarried women**



7.4 SUMMARY OF FINDINGS

The principal result of this study was that women with postnatal depression scored less highly on a questionnaire of "suicide-related cognitions" than women with depression who were not in the first postnatal year. The greatest individual differences between the two groups were on items reflecting hopelessness and thoughts of self-harm under stress.

CHAPTER EIGHT

CHAPTER EIGHT

DISCUSSION

8.1 INTRODUCTION

The principal results of these studies were as follows:

- 1 The age-standardised suicide rate in women in the first postnatal year was found to be one sixth of the rate in the female population;
- 2 The age-standardised suicide rate in pregnant women was found to be one twentieth of the rate in the female population in general;
- 3 The age-standardised odds ratio for parasuicide by women in the first postnatal year was found to be 0.43, indicating that their risk of self-harm is half that of the female population;
- 4 Women with postnatal depression scored significantly lower than women with depression arising at other times on a scale measuring cognitions of worthlessness, hopelessness and self-harm.

This chapter critically assesses these results and considers their implications.

8.2 METHODOLOGICAL ISSUES

8.2.1 Comparison with previous studies

1 Age-standardisation As discussed in Chapter 3, one of the principal omissions of previous studies has been the lack of age-standardisation when estimating rates of suicide and self-harm. In the present studies, however, each estimation of rates was based on age-specific calculations, in recognition of the fact that rates of suicide, parasuicide and birth are all influenced by age. In study 1, the mortality ratio for postnatal suicide varied with age, being higher in younger groups, but the difference was not significant. In study 2, however, the mortality ratio for pregnant teenage women was significantly higher than that for other ages, although the rate compared to the general female population was low at all ages. In study 3, age-specific rates were incorporated in the calculation of the overall odds ratio.

2 Comparison samples Similarly, few of the studies described in Chapter 3 compared their results to a standard population or any other comparison group; nevertheless, most of their estimates of suicide rates in childbearing women appeared to be low. Of the several

studies of parasuicide in which the proportion of pregnant women was calculated, only that of Birtchnell (1975) was able to state whether the figure is high or low in comparison to a non-parasuicidal control sample.

In the present studies, all calculations included comparison with non-childbearing women, and it was possible to apply tests of significance to the resulting ratios.

3 Sample size Any previous studies that made reference to suicide in childbearing women had few cases - in most, e.g Seagar and Flood (1965), this had not been the main focus of the research. Even in studies of maternal mortality from suicide and other causes, however, relatively few pregnant and postnatal suicides were reported. In part this reflects the fact that suicide is relatively uncommon; if, as it appears from these studies, suicide is even more uncommon in childbearing women, large numbers of births or suicides would have to be examined to produce an adequate sample size for accurate calculation of rates. Such numbers require data collection over several years and/or a large geographical area. The characteristics of postnatal suicides could also be explored in more detail only with a larger sample size than was available to these studies.

In this thesis data from a twelve year national sample was presented. Studies 1 and 2 therefore form the largest examination of suicide in childbearing women. Study 3 is a smaller study, comparable in size to other research on parasuicide and childbearing.

4 Completeness of sample Barno (1967) found ten postpartum suicides in a sixteen year sample, all within the first three months postpartum, and any suicides that occurred later in the first postnatal year were omitted. This is important because in the Swedish study (Hogberg et al. 1994), most maternal suicides were "late", being found after the puerperium. In the present study, using the *Confidential Enquiry* allowed suicides to be collected from throughout the first postnatal year, so that late postnatal suicides should have been included (the completeness of the *Confidential Enquiry* will be discussed further below).

In the Kleiner and Greston (1984) calculation, open verdicts were excluded. In the present study suicides, open verdicts and misadventures were included to reduce the possibility that the number of pregnant and postnatal suicides was an underestimate (whether including misadventures is a source of error in itself is discussed

below).

8.2.2. Sources of error in the present studies

1 Completeness of data collection from Confidential

Enquiry The principal results of these studies, the low mortality ratios for suicide in postnatal and pregnant women, depend for their accuracy on the completeness of the maternal suicide sample obtained from the *Confidential Enquiry*. How comprehensive, therefore, was its system of data collection?

The authors of the *Report on Confidential Enquiries into Maternal Deaths* estimate that the completeness of their postnatal sample depends on the time since delivery and the nature of the causal relationship between childbirth and death (D.H.S.S., triennial publication). Maternal deaths can be divided into puerperal (i.e. occurring during the first six postnatal weeks) and late (i.e. occurring after this period); they can also be divided into direct, indirect and fortuitous, according to the presumed role of childbirth in leading to death. Approximately 99% of direct puerperal deaths are estimated to be included in the *Confidential Enquiry*, and its authors believe that a slightly lower proportion of

indirect puerperal deaths are also included. Data on late deaths and fortuitous deaths occurring at any time are thought to be less complete, but the exact extent of under-reporting is unknown. It is therefore possible that the low mortality ratio in postnatal women could have been the consequence of incomplete sampling. However, there are several reasons to doubt that this is the explanation.

Firstly, only if 83% of postnatal suicides were missed would the low ratio be cancelled out (although the 95% confidence interval would suggest a non-significant result with a smaller percentage of additional cases), and an even greater number of omissions would be needed to give a suicide rate consistent with the high rate of severe postnatal psychiatric morbidity. Under-reporting to this extent would undermine the *Confidential Enquiry* as a whole, and there is no reason to believe that it occurs. Alternatively, if omitted cases were disproportionately common during the first postnatal month (when the numbers of reported suicides was at a peak), a lesser degree of under-reporting during the remainder of the first postnatal year would leave the *Confidential Enquiry* as a whole reasonable accurate while seriously affecting the accuracy of estimates of suicide. However, this possibility too seems unlikely as deaths during the first postnatal month are thought to be relatively complete in

the *Confidential Enquiry*.

Secondly, assuming the collection of cases to be reasonably accurate during the first postnatal month, a time when psychiatric morbidity is at a peak, these results show the observed number of suicides (18) to have been well below the expected number (34.6). Thirdly, the pattern of maternal suicide, according to these results, is consistent with the known pattern of postnatal illness; there was, in other words, an early postnatal peak followed by a possible later peak and then a decline in the second half of the year. Fourthly, equivocal cases receiving verdicts of misadventure at inquest were included.

An accurate check on the completeness of the data on suicide would require extensive cross-matching of birth and death registers and would itself be a substantial study with its own methodological flaws. A simpler method is to select a fatal condition that could not influence or be influenced by fertility or childbirth (these criteria exclude vascular disease, accidents and tumours), and to carry out an analogous calculation of the expected number of deaths in childbearing women. This has been done for meningitis, using age-specific death rates for women aged 15 - 44 years during 1976-81, obtainable from official

mortality statistics (OPCS, annual publication). During these years the expected number of deaths from meningitis in childbearing women was 2.4, while the actual number in the *Confidential Enquiry* was 2. It must be accepted that such small figures are only minor pieces of evidence for the completeness of the *Confidential Enquiry*; yet it is notable that there is no large discrepancy as there was with suicide.

The above discussion applies particularly to postnatal suicide, as the risk of under-reporting of pregnant suicides is considerably less - the *Confidential Enquiry* is thought to receive notification of almost all deaths in pregnant women. Suicides in particular, being sudden deaths, would be subject to *post mortem* examination and coroner's inquest; current pregnancy would most likely be identified during this process.

2 Definition of suicide In Studies 1 and 2, all cases, whether pregnant or postnatal, reported to the *Confidential Enquiry* following coroner's verdicts of suicide, open verdict or misadventure, were included in the calculation of mortality ratios. It has become conventional to include some or all open verdicts, or deaths officially recorded as occurring from undetermined cause, in suicide studies; however, it is not routine to

include deaths from misadventure.

In these studies, deaths from misadventure were included because, as the case descriptions given in Study 1 demonstrate, these appeared to be suicides according to details supplied by the Department of Health. It therefore seemed undesirable to exclude them, particularly when an even lower mortality ratio would be the result. Instead, all cases that seemed likely to be suicides were accepted as suicides for the purpose of the studies, including deaths recorded as misadventure.

The SMR for pregnant women was unaffected by this as no cases of misadventure appeared in the pregnant sample. In the postnatal sample, four of the 76 cases were misadventure. Including them therefore raised the overall SMR only slightly.

3 Different sources of data The mortality ratios were calculated using data obtained from two sources, deaths reported to the *Confidential Enquiry* and national data on mortality, population size, and births. The numerator and denominator in the mortality ratios therefore had different, if related, origins. This is a potential source of error, although each component of the ratio is derived from the best data available. In addition, the

mortality ratios were very low and unlikely to be greatly altered by minor incompatibilities in data sources.

4 Birth statistics The estimate of birth numbers used in the calculation was total births, a combination of live births and stillbirths, i.e. the number of children delivered. By this method of recording birth numbers, multiple births were counted more than once and the resulting total was not quite the same as the number of women giving birth, the latter being represented by "maternities".

Total birth numbers were used, however, so that the calculation of the mortality ratio after stillbirth could be based on the same data source as the overall postnatal mortality ratio, to allow accurate comparison. The "double counting" of twin births is a minor source of error, as only 1% of births in the U.K. are twin births; the postnatal SMR would be almost the same - different by around 0.5% - without their inclusion.

5 Adjustment for awareness of pregnancy In Study 2 the hypothesis under test concerned not simply suicide in pregnancy but suicide by women who knew they were pregnant. This is because the explanation being pursued for the findings in Study 1 was that awareness of

pregnancy and cognitions related to this are protective. As a result, the calculation of the expected number of pregnant suicides included adjustment of annual figures by a factor of 34/52, assuming that women are aware of pregnancy for 34 weeks. The effect of using 34 weeks rather than 40 weeks was to lower the expected figure and therefore raise the observed:expected mortality ratio.

The selection of 34 weeks, however, although it may be based on a reasonable assumption, is lacking in supportive evidence. It could equally be argued that 6 weeks' gestation is a relatively early point in pregnancy and that for many women confirmation of pregnancy takes place later. This may have been particularly true in the years 1973 - 1984 when pregnancy testing was less sensitive and less widely available. If a later time had been chosen, the mortality ratio would have been higher.

However, as the symptoms of early pregnancy often appear at the time of the first missed menstrual period, it seems likely that many women know, or strongly suspect, that they are pregnant some time before this is confirmed. As a mean duration of awareness of pregnancy, therefore, 34 weeks is justifiable. Presumably as a result of similar reasoning, Birtchnell and Floyd (1974; 1975), in their study of parasuicide in relation to pregnancy and the

menstrual cycle, included in their pregnant group those women whose menstrual period was late and who thought they were pregnant.

It should also be said that, if a shorter duration of awareness of pregnancy had been chosen, this would have affected the numerical value of the mortality ratio for pregnant women only slightly.

6 Identification of postnatal parasuicides At the time of Study 3, all parasuicides attending King's College Hospital were known to the liaison psychiatry service, whether or not they were admitted. None, therefore, would have been missed from the subsequent data collection, except those not satisfying the inclusion criteria of age and place of residence. However, two types of parasuicidal individual would have been missed: those who did not attend hospital at all, and those who lived in the King's College Hospital catchment area but who attended another hospital following parasuicide.

These would be significant omissions from a study of absolute rates of parasuicide. However, this study was of a ratio based on comparison of the rate of parasuicide in postnatal women and the rate in non-postnatal women. Only if there were a disproportionate loss of postnatal

parasuicides by one of these routes would the resulting odds ratio be artificially lowered. There is no obvious reason why outward migration from Camberwell would occur more commonly in postnatal women after parasuicide. It could however be argued that, because they had a child to care for, the postnatal women would be less likely to seek hospital treatment - but equally, they would be more likely to be living with a partner who might ensure that they did attend.

Therefore, it seems that there is little reason to regard the low odds ratio for postnatal parasuicide as being caused by under-reporting, though the absolute rates used in its calculation are likely to be underestimates.

Classification of parasuicides into postnatal and non-postnatal was carried out according to information from one of three sources. In most cases, subjects themselves were asked directly. For those who left hospital without being seen by a psychiatrist or liaison nurse, Casualty records were examined for details of family and living circumstances. If these did not give satisfactory details, the patients' general practitioners were asked directly if a child had been delivered within the previous year, and to provide the ages of all children in the family. Although mis-classifications would have been

possible, they were thought to be highly unlikely by this system of data collection.

7 Catchment area data The number of births and the estimates of resident population for Camberwell used in the calculation of parasuicide rates in Study 3 are taken from mid-year estimates from 1990. The actual data collection took place, however, during the six months from November 1990. There is therefore a slight mismatch in the timing of figures used to calculate the odds ratio. However, any inaccuracy is likely to be small, and its direction is unknown.

The population totals for 1990 are those based on projected changes in the population following the 1981 census and subsequent smaller surveys, and could therefore be inaccurate in either direction. The only alternative way of estimating the population in Camberwell would have relied on subsequent estimates of the resident population, such as the 1991 census, but these are thought to have been significantly affected by non-registration for payment of the community charge. The figures used therefore represent the best estimate of population size available to the study.

8 Coping styles questionnaire The measurement of

"suicide-related cognitions" in Study 4 used a cognitive questionnaire that had not been used in any previous study. It had been designed for a study of parasuicide repetition and was intended to represent cognitions that might be present under stress in individuals who were prone to self-harm. Its items therefore tested the presence or absence of worthlessness, hopelessness, thoughts of self-harm, and alternative ways of finding help when facing problems. Because it had not previously been used and had been designed for use with a population different from the one under study here, its reliability and validity must be assessed.

Test-retest reliability was examined on an unselected subgroup of the study sample, and the results are given in Study 4. Test-retest reliability appeared to be acceptable, even though mood scores had improved between the two testing occasions, although the low scores in those tested twice suggest that this result was based on respondents who tended to score 0 on most items. Split-half reliability and internal correlations were not tested. As the questionnaire was completed by the subjects themselves, there is no test of inter-rater reliability.

The questionnaire items are expressed simply and appear to

have good face validity. However, its use in patients at high risk of self-harm repetition has not yet been subject to tests of concurrent or predictive validity, e.g. subsequent *actual* self-harm. There is no single construct, such as hopelessness or suicidal *intent*, against which its construct validity could be measured.

The questionnaire has not therefore adequately demonstrated its reliability or validity for use with self-harming individuals. However, as a simple cognitive questionnaire assessing the presence and intensity of selected cognitions, its use can be justified on grounds of its face validity and repeatability. Its face validity appears to be supported by the findings of Study 4: the two groups differed to some extent on all questionnaire items except the two that related most closely to parasuicide repetition rather than low mood.

9 Comparison sample of depressed, non-postnatal women In Study 4, the comparison sample of depressed women who were not in the first postnatal year could be criticised on two counts. Firstly, it was a relatively small sample, consisting of 20 patients (compared to 47 in the study sample). Secondly, being derived from hospital patients, it could have been affected by a selection bias in that patients attending hospital could have been more depressed

or more suicidal than subjects found to have postnatal depression in a community survey.

However, the two groups did not differ on mean scores on the CIS-R (Lewis et al. 1992); the differences between the groups can not on this evidence be attributed to greater depression in the hospital sample. But it remains possible that patients referred to psychiatric services are more suicidal than depressed people in the community, and that this is one of the reasons for their referral. This can not be discounted, although it should be emphasised that most of the non-postnatal depressed subjects were out-patients or day patients, i.e. attending settings where the most suicidal or acutely ill patients are less likely to be found. In addition, depressed patients who were thought by their psychiatrists to have abnormal personalities were not asked to be part of the comparison sample, so that patients who were in contact with psychiatric services primarily because of their behaviour rather than their depression itself were not recruited.

8.2.3. Summary of methodological issues

The present studies appear to have avoided the principal

difficulties of previous work in the field. Although there were a number of possible sources of inaccuracy in the data, these would have had little effect on the mortality ratios in Studies 1 and 2, and would not have affected the overall findings of these studies. In particular, under-reporting of suicides to the *Confidential Enquiry*, although it may have occurred, is unlikely to explain the low mortality ratios.

Study 3, as a smaller study leading to an odds ratio that was less emphatically reduced and whose confidence interval was wide, would have been more vulnerable to minor inaccuracies in data collection or catchment area statistics. Nevertheless, the odds ratio of 0.43 was the best estimate allowed by the available data. Study 4 relied on the face validity of the questionnaire and the comparability of the control sample, both of which could be criticised. Nevertheless, it is the first study to have provided any experimental evidence to explain in individual or cognitive terms the low suicide risk associated with childbearing populations.

8.3 POSSIBLE EXPLANATIONS OF PRINCIPAL FINDINGS

8.3.1. The low rate of postnatal suicide

The main finding of Study 1 was that the rate of suicide in the first postnatal year was one sixth of the rate in the age-matched female population, despite the high rate of severe psychiatric illness. This result does not appear to have been caused by methodological or statistical flaws, and possible explanations are considered below.

1 Low psychiatric risk In some recent studies (O'Hara et al. 1990; Cooper et al. 1988; Watson et al. 1984) the increased rate of non-psychotic depression in the postnatal period reported by previous research (Pitt 1968; Kumar & Robson 1984) has been questioned. Although the rate of depression postnatally is substantial, in the region of 10%, this may be no higher than the rate in non-postnatal women whose depression arises in other circumstances, according to these authors. The recent study by Cox et al. (1993) seems to provide a compromise between these opposing views. In their study, the risk of depression in the first six months postnatally was not elevated in comparison to a non-postnatal female control

sample, but there was a three-fold increase in the number of new cases arising in the first five weeks postnatally. The mean duration of depression in the postnatal group was 36 weeks.

These studies suggest that there is an increase in non-psychotic depression in the immediate postnatal period, and that such episodes last for several months. When a longer duration is used in the definition of the postnatal period, the period prevalence of depression may not be raised. However, none of these studies demonstrates the low rate of postnatal psychiatric morbidity that might explain the low rate of suicide. Furthermore, it is clear that the rate of severe mental illness in postnatal women is high (Paffenbarger 1964; Kendell et al. 1987).

The low rate of suicide in postnatal women can not therefore be attributed to a low rate of psychiatric morbidity in postnatal women.

2 Low rate of risk factors for suicide Although the rate of psychiatric disorder is not low, one related explanation is that the postnatal population carries few other risk factors for suicide. For example, postnatal women are likely to have marital or equivalent relationships, and are relatively unlikely to be living

alone. Perhaps the absence of these risk factors, which in other circumstances add to the risk of suicide associated with mental illness (Allebeck & Allgulander 1990), could explain the low rate of postnatal suicide.

The *Confidential Enquiry* collects little relevant information about conventional risk factors, but it does provide information on marital status. In Study 1, the mortality ratio for unmarried women was calculated to be 40. As this figure is more than twice the figure obtained for all postnatal women, it appears that being married contributes to the low overall rate. However, it equally shows that unmarried postnatal women also have a significantly low rate of suicide, and other explanations must be sought.

3 Family and professional support The first postnatal year is a time of close contact with health professionals, family and friends. It may be that the risk of suicide is reduced by either close support for vulnerable people, or early detection of risk. However, the highest rate of suicide is found in the first postnatal month, probably the time of closest support from families and most frequent contact with professionals. This timing makes it less likely that such factors are the main source of the low rate but it is possible that the early postnatal risk

would be higher still without such monitoring.

4 Protective effect of motherhood The remaining explanation is that psychological factors associated with being a mother are protective against suicide; in other words, that child-related cognitions exert a powerful protective influence. There are a number of features of the results of Study 1 that are consistent with this explanation.

Firstly, the absence of a low mortality ratio after stillbirth supports the presence of an infant as the crucial protective influence. Each of the four stillbirths in Study 1 was a first pregnancy, so no older children could compensate for the lost protective effect. Alternatively, stillbirth may be associated with postnatal psychiatric disorder (Kendell et al. 1987), thus raising the risk by a different route.

Secondly, the continuing low risk of suicide at the end of the first postnatal year would be expected if child-related cognitions were protective. Thirdly, the data suggest that many of the suicides occur during psychosis, for the following reasons: the peak of suicides in the first postnatal month coincides with the peak time for postpartum psychosis (Kendell et al. 1987); the use of

violent and active methods of self-harm suggests that the women were psychotic at the time of death; and many of the suicides had a known history of psychiatric illness (though its severity was not reliably described). If many of the suicides did arise during psychosis, this would support the proposal that child-related cognitions are protective because it would be during acute psychosis that the greatest disruption of such rational concerns would be expected.

The results of Study 1 can therefore be largely attributed to a powerful protective effect of having a child, mediated by rational cognitions such as awareness of being needed, or of responsibility to a dependent individual, both of which could be seen as improving self-worth.

To explain the temporal pattern of suicide, such cognitions would have to be disrupted most by psychotic illness, but retained in many cases of postnatal depression. The possible rise in suicides around the fifth month postnatally (see Study 1) may reflect non-psychotic depression occurring at this time, but the rise is less marked than the peak in the first month, despite the fact that postnatal depression is much more common than postpartum psychosis. The second peak may be smaller because, although postnatal depression is more common, it

is less severe, and any protective maternal cognitions are retained.

8.3.2. Low risk of suicide in pregnancy

If the above explanation is correct, a similar protective effect would be predicted in the related population of pregnant women - indeed, for two reasons it might be more emphatic. Firstly, in pregnant women awareness of a child's need would be at its most direct. Secondly, the rate of psychosis is low. Although the rate of non-psychotic depression appears to be almost as high as it is postnatally (Kumar & Robson 1984; Watson et al. 1984), women with this disorder should retain their putative protective cognitions.

The results of Study 2 confirm this prediction. The rate of suicide was low, and lower than that in postnatal women. Suicide was a rare event during pregnancy, including during the first trimester when depression is most likely to be found (Kumar & Robson 1984).

Although the incidence of female suicide generally increases with age, within the population of pregnant

women teenagers seem to be at considerably greater risk. Most of the teenage suicides in this study had no recorded past or recent psychiatric history; in this they differed from the older women, which suggests that any link between psychosis and suicide may not apply to teenage women. Yet this finding too is consistent with the cognitive explanation of the low suicide rate, because pregnancy seems to be more often unwanted among teenagers - birth statistics show that teenagers have the highest rate of abortion (OPCS, annual publication). For this reason, any adverse psychological impact of becoming pregnant is likely to be greatest in teenagers and the protective effect of motherhood reduced, even in the absence of psychosis. If this is correct, teenagers who are unhappy about being pregnant are a high-risk group within a low-risk population.

8.3.3. Low risk of parasuicide in postnatal women

Such protective cognitions could be predicted to lower the postnatal risk of parasuicide as well as suicide. Study 3 confirmed that the risk of parasuicide was low in the first postnatal year, although the result was less emphatic. The numbers were small, but there was no suggestion of any preponderance of teenagers. Similarly,

only one subject used a violent method of self-harm, and no conclusions about psychotic methods can therefore be drawn.

Why should any protective effect be less powerful in parasuicide than it is in suicide by postnatal women? The explanation presumably lies in differences between the phenomena of fatal and non-fatal self-harm. Although, as Chapter 2 describes, they are related in that certain risk factors are common to both and in that parasuicides have a high risk of completed suicide, there are also a number of differences.

One of these is the relationship to severe mental illness, which is much stronger in suicide. From this one would expect that protective cognitions would have more impact on parasuicide, whereas the reverse appears to be the case. Suicidal and parasuicidal individuals are also thought to differ in intent with parasuicides being less suicidal and using less dangerous methods of self-harm as a way of communicating distress. If the motives of many parasuicides were not primarily to bring about their own deaths, they might be less likely to be restrained by motherhood.

8.3.4 Suicide-related cognitions

The results of Studies 1 - 3 suggested that childbearing women have low rates of suicide and self-harm and that this could be explained by protective cognitions related to motherhood, and retained in the presence of non-psychotic disorder. Study 4 was an attempt to identify cognitive differences between postnatal and non-postnatal women who were depressed. In particular, it examined cognitions related to (a) self-worth, being needed and being cared for; (b) optimism about feeling less upset and about the resolution of problems; (c) coping with problems by self-harm. It was predicted that the postnatal group would show less evidence of maladaptive cognitions - worthlessness, hopelessness and thought of self-harm - and that the difference between the groups would be most marked on items related to self-worth, reflecting maternal awareness of being needed.

The results confirmed a significant difference between the two groups on the questionnaire as a whole; the differences was in the predicted direction, with the postnatal group scoring less on most items. However, the differences on individual items was most marked on cognitions of optimism ("Any problems I have will be solved in the end") and self-harm in response to adversity

("Taking an overdose or harming myself is sometimes the only way out of my problems"). In other words, women with postnatal depression did appear to cognitively distinct, with less tendency to thoughts of self-harm, but this effect was not only related to self-worth. As has been described in other patient groups (Beck et al. 1985), hopelessness appeared to be an important suicide-related cognition.

Why should women with postnatal depression be less prone to hopelessness than other, equally depressed, women? The present studies do not answer this question, though the explanation may be related to women's perception of low mood in the postnatal period. Women with postnatal depression commonly attribute their emotional disturbance not to depression but to their current circumstances, such as the fatigue of looking after a young infant. This may mean that they are more likely than other people with depression to expect their mood to improve as the child becomes older, and therefore to feel more optimistic.

8.3.5 Explanations for suicides in childbearing women

In the studies of suicide in both pregnancy and the postnatal period, the low rates were least evident among

teenagers, and in pregnant suicides the influence of age on mortality ratios was significant. As mentioned above, this finding supports the possibility that protective cognitions of motherhood may lower the risk of suicide, because in teenagers childbearing is likely to be least welcome and the protective effect minimised. It also identifies teenagers as a group at higher relative risk than other childbearing women.

From these findings it is therefore possible to suggest explanations for the apparent fall in suicide among childbearing women during this century. The early studies quoted by McClure et al. (1971) suggested a high risk of suicide among pregnant women, but this is no longer the case, according to these results. To explain this change, it is necessary to look for aetiological factors for suicide that have fallen in the female population as a whole but fallen least in teenage pregnant women, and the most obvious possibility is the distress of unwanted pregnancy. Better and more widely available contraception, easier legal abortion and greater social tolerance of unmarried pregnant women are likely to have reduced unwanted pregnancy and its psychological impact but may have had less effect among teenagers. The higher rate of suicide in unmarried postnatal women may support unwanted pregnancy as an important risk factor in itself,

although marital status may exert its main effect by increasing the risk of postpartum mental illness, both psychotic (Kendell et al. 1987) and non-psychotic (O'Hara et al. 1984).

In Study 3, however, parasuicide did not appear to be related to marital status or age, although numbers were too small for reliable analysis.

8.3.6 The effect of marriage

Previous studies of suicide have not usually distinguished the protective effects of marriage and parenthood. The work of Durkheim (1952) and Veivers (1973) suggests that the effect of children is the greater. The findings of the present studies seem to confirm that young children are an important influence on suicide risk. In addition, Study 1 contains enough subjects to measure suicide rates in married and unmarried postnatal women. Both groups were found to have low rates, although the mortality ratio was higher - i.e any protective effect was less - in those who were unmarried.

Similarly, in Study 4, the difference in suicide-related

cognitions between postnatal and other depressed women did not appear to be explained by marital status.

8.3.7 The effect of stillbirth

In Study 1 stillbirth was associated with a mortality ratio higher than that found in other childbearing women, but no higher than the control population of the general female population. Two explanations are possible. Firstly, that the absence of a child removes the putative protective effect of parenthood. Secondly, that stillbirth acts as an adverse life event, raising the risk of mental disorder in the postnatal population (Kendell et al. 1987) and thus raising the risk of suicide. A combination of both explanations is also possible.

8.3.8 Timing of suicide and self-harm

Postnatal suicide was commonest in the early postnatal period, suggesting an association with psychosis. In Study 3, however, parasuicide did not appear to cluster in the puerperium, although numbers were small.

Pregnant suicides mainly occurred in the second trimester,

a time that is thought not to be associated with psychotic or non-psychotic disorder.

8.3.9 Methods of suicide and self-harm

The preponderance of violent or active methods of suicide in the postnatal period once again suggested an association with psychosis. There was no similar finding in pregnant suicide. Although numbers of postnatal parasuicides were too small to allow similar conclusions to be drawn, the one violent episode of self-harm in the study occurred in a postnatal subject.

Violent methods did not become less frequent proportionately as the first postnatal year progressed, suggesting that the majority of postnatal suicides may be psychotic, even well after the peak period for the occurrence of postpartum psychosis.

8.3.10 Infanticide

The number of infanticides in the postnatal sample was high (5%). Infanticide and suicide in postnatal women appear to be related.

8.4 IMPLICATIONS OF FINDINGS

8.4.1 Clinical management of postnatal disorders

The main result of these studies is that postnatal and pregnant women were found to have a low rate of suicide. However, when suicide does occur it appears to be associated with psychosis, and is most likely in the first postnatal month. This means that it occurs at a time when access to medical services should be a matter of routine, and that at least some cases occur in those whose risk could be identified before delivery, e.g. women with a history of postpartum or other affective psychosis.

The results should not be taken to mean that the risk of suicide in postpartum psychosis is low, and individual cases still need careful preventive management, with admission to psychiatric hospital a likely part of treatment. However, it may be true that the risk in less severe postnatal depression is lower than in other depressed groups, because of protective cognitions related to motherhood. Postnatal depression may therefore be atypical - not symptomatically atypical, as Pitt (1968) described, but cognitively atypical.

Even so, women with postnatal depression do still commit suicide and every effort should be made to identify those at highest risk. These results suggest that unmarried women and women who have had a stillbirth carry a higher risk than postnatal women in general, and depressed women in these circumstances should be monitored carefully. Similarly, postnatal women who do not appear to be protected by child-related cognitions may be at higher risk, e.g. those whose children are removed into social service care, and those who as a result of depression believe that their children would be better off without them.

8.4.2. Management of teenage pregnancy

The results of Study 2 show that in teenage women pregnancy is associated with a greater risk of suicide than it is in older women. Suicide in pregnancy in general, however, is uncommon, and appears to have become less common during this century, according to the review of early studies by McClure (1971), which reported that 13.5% of female suicides were pregnant, and the study of Weir (1984) in which there were 66 pregnant suicides in 20 years in London alone between 1943 and 1962, compared with 14 in England and Wales in 12 years here.

The fall in pregnant suicides is probably the result of more tolerant social attitudes, better and more widespread family planning, and easier legal abortion. The risk associated with teenage pregnancy suggests that these attitudes and services must be made more readily available to teenagers.

8.4.3 Suicide in other "at risk" groups

These studies have identified motherhood as a probable protective factor against suicide, capable of counterbalancing, without actually altering, other suicide risk factors such as the presence of psychiatric illness in postnatal women. Can similar protective effects be seen in other populations?

Women with non-psychotic depression arising at times other than postnatally are known to have a high rate of depression, particularly in the presence of young children (Brown & Harris 1978), yet women in young adult age groups also have relatively low rates of suicide, and this too can be related to the presence of children (Durkheim 1952; Hoyer & Lund 1993). The low rate of postnatal suicide in Study 1 was still evident at the end of the first postnatal year, and it is possible that the same

protective effect of motherhood is one of the reasons for low suicide rates in the female population as a whole. If this protective effect includes an awareness of being needed, as suggested by Study 4, it ought to be related to the age of dependent children, and to diminish as children reach adulthood. National statistics confirm that suicide increases as women grow older, and one reason may be the loss of cognitive protection associated with caring for young children.

The same protection should not be specific to women, any more than it should be specific to the postnatal period. Durkheim (1952) demonstrated that suicide was more common in men without children, and that the absence of children had a greater adverse effect on the risk of suicide than the related circumstance of being unmarried. Suicides by unmarried men were, in his view, a form of egoistic suicide, occurring because the individual was more preoccupied with himself than with human society as a whole. The impact of divorce, which was also to increase the risk of suicide, arose because the divorced man lost the bonds that linked him to his social group (i.e. the family) - an example of what was referred to by Durkheim as anomic suicide.

An alternative - cognitive - interpretation of these

phenomena is that there is a loss of self-worth in divorced men because of the loss of their children. As one explanation for the rise of suicide in young men in the last two decades is the similar rise in divorce, loss of the protective effect of children may have contributed to this, although several other factors are likely to be at least as important.

In Chapter 2, the possible reasons for the rise in young male suicide were listed as: increased use of drugs and alcohol, rising divorce and unemployment, and increasing use of dangerous methods of self-harm. Of these, only the last is clearly linked to males who now kill themselves most often with car exhaust fumes. However, as suggested in section 2.2.4, the rise in young male suicide may also be related to factors that are not more common in men than women, but that have more impact on males. Divorce, by definition, is experienced by men and women at equal frequency, but the nature of that experience differs according to sex. If, as is suggested here, parenthood is protective against suicide through cognitive mechanisms, divorce - although it may raise the risk of suicide in both sexes - will have less effect on those who retain responsibility for child care.

8.4.4. Preventive intervention in managing suicide risk

Finally, what are the implications for preventing suicide in clinical practice? A great deal is known about the epidemiology of suicide and self-harm, particularly about population risk factors, such as age and sex, and protective factors, such as religion. Once these population effects are recognised, it becomes important to understand them in individual or cognitive terms, so that they can be the basis of individual intervention. In other words, it becomes necessary to translate risk factors such as marital status and alcohol into preventable individual phenomena such as hopelessness and poor impulse control, and then to develop treatment approaches that can target such key clinical features.

From these studies the question for intervention is: how can the cognitions that appear to be associated with the low risk of suicide and self-harm in postnatal women be applied to high risk groups? If the relative absence of hopelessness and worthlessness in postnatal depression is largely responsible for the low risk, as these results suggest, then these should be target symptoms for treatment of other groups at risk of suicide or parasuicide.

One of the few interventions to reduce parasuicide in a high-risk patient group has been the cognitively-based psychotherapy of Linehan et al. (1991), although its intensive nature over one year makes it impractical in most clinical services. Nevertheless, it may be that a similar treatment approach, if focussed not on all depressed thoughts - as in conventional cognitive therapy - but specifically on these key cognitions, could provide a way forward in suicide and parasuicide prevention.

8.5 SUMMARY

The risk of suicide in pregnant and postnatal women appears to be low; the risk of parasuicide in postnatal women is also low, though less emphatically so.

Suicides that do occur in postnatal women are most likely in the first postnatal month; violent methods of self-harm are common. Being unmarried does not explain the low risk but it appears to contribute to it. Stillbirth is associated with a higher risk among postnatal women. The association with marital status and violent methods of self-harm is not found in pregnant suicides, nor postnatal parasuicides. Postnatal parasuicides do not cluster in the puerperium. Pregnant suicides show some clustering in the second trimester. Pregnant suicides are associated with teenage women.

Many of the findings on postnatal suicide suggest a close association with psychosis rather than non-psychotic depression. Because non-psychotic depression is common in postnatal women, the low rate of suicide may reflect a particularly low rate in postnatal depression. One explanation for this is that maternal cognitions are protective and that these are retained in depression but

not psychosis. Women with postnatal depression appear to be cognitively different from other women with depression in that they have less suicide-related cognitions such as worthlessness, hopelessness and thoughts of self-harm in response to distress.

More tolerant social attitudes to unmarried pregnancy and abortion may therefore have reduced the risk of suicide in pregnant women in recent decades, but teenage women are still a relatively vulnerable group. Women with postpartum psychosis remain at risk of suicide, particularly in the first postnatal month, and monitoring of such women is vital. Cognitions may be powerful protective influences on suicidal behaviour, and may explain large population effects. Such key cognitions should be the specific target of preventive interventions in working with suicidal individuals.

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4. Hospital Anxiety and Depression Scale (1983) (see above).
5. Hospital Anxiety and Depression Scale (1983) (see above).

APPENDIX

- 1 The Edinburgh Postnatal Depression Scale (EPDS) (Cox et al. 1987).
- 2 The Revised Clinical Interview Schedule (CIS-R) (Lewis et al. 1992).
- 3 The "coping styles questionnaire" used in Study 4.
- 4 Appleby, L. (1991) Suicide during pregnancy and in the first postnatal year. *British Medical Journal*, 302, 137-140. This paper contains the principal results of Studies 1 and 2.

Date:

Initial Contact No.....

Patient Initials:.....

EDINBURGH POST NATAL DEPRESSION SCALE (EPDS)

Please think about the way you have felt during the past week and underline the answer which comes closest to these feelings

1. I have been able to laugh and see the funny side of things

As much as I always could

Not quite so much now

Definitely not so much now

Not at all

2. I have looked forward with enjoyment to things

As much as I ever did

Rather less than I used to

Definitely less than I used to

Hardly at all

3. I have blamed myself unnecessarily when things went wrong

Yes, most of the time

Yes, some of the time

Not very often

No, never

4. I have been anxious or worried for no good reason

No, not at all

Hardly ever

Yes, sometimes

Yes, very often

5. I have felt scared or panicky for no very good reason

Yes, quite a lot

Yes, sometimes

No, not much

No, not at all

6. Things have been getting on top of me

Yes, most of the time I have not been able to cope at all

Yes, sometimes I have not been coping as well as usual

No, most of the time I have coped quite well

No, I have been coping as well as ever

7. I have been so unhappy that I have had difficulty sleeping

Yes, most of the time

Yes, sometimes

Not every often

No, not at all

8. I have felt sad or miserable

Yes, most of the time

Yes, quite often

Not very often

No, not at all

9. I have been so unhappy that I have been crying

Yes, most of the time

Yes, quite often

Only occasionally

No, never

10. The thought of harming myself has occurred to me:

Yes, quite often

Sometimes

Hardly ever

Never

INTRODUCTION

Ask name. Do not record on form.

I would like to explain a few things about the interview.

- Firstly, it has been designed to assess your general health and well being for research purposes.

- It mainly asks about the PAST WEEK, by that I mean the SEVEN DAYS since last _____.

- The questions have already been written out and so it will not sound like a normal interview and some questions may be somewhat inappropriate for you.

- Finally, all the answers will be kept confidentially.

SOMATIC SYMPTOMS

Have you had any sort of ache or pain recently, for example headache or indigestion?

Have you been troubled by any sort of bodily discomfort recently?

Is this [pain/discomfort] brought on or made worse by feeling low, anxious or stressed?

No: proceed to next section
 Yes or don't know: proceed

On how many days have you noticed this [pain/discomfort] during the past week?

None
 0 \leq 3 days
 1 \geq 4 days

Has the [pain/ discomfort] lasted more than 3 hours on any day during the past week?

0 Less than 3 hours
 1 More than 3 hours

Has the [pain / discomfort] been unpleasant in the past week?

0 Not at all
 0 A little unpleasant
 1 Unpleasant

Has the [pain / discomfort] bothered you when you were doing something interesting, in the past week?

0 No, pain does not bother subject.
 1 Yes, pain troublesome on one or more occasion
 0 Has not done anything interesting

ONSET

If any positive score ≥ 2 : You have told me of some psychological symptoms you have had over the past week. [give example]

Which of these do you find the worst?

When did this symptom start?

Starting date

Code DURATION in weeks

IMPAIRMENT

In the past week, have these symptoms actually STOPPED you from getting on with the tasks and activities you usually do or would like to do?

If answers no:

Has it made it more difficult even though you have got everything done?

- 0 Not impaired
- 1 More difficult but gets everything done
- 2 It has stopped one activity
- 3 It has stopped more than one activity

This is the end of the interview.
Thank you for taking part.

DELUSIONS

- 0 No
- 1 Partial
- 2 Full

HALLUCINATIONS

- 0 No
- 1 Partial
- 2 Full

POOR UNDERSTANDING

- 0 No
- 1 Possible or mild
- 2 Definite

EXAGGERATION

- 2 Marked
- 1 Mild
- 0 None

DEFENSIVENESS

- 1 Mild
- 2 Marked

FATIGUE

Have you noticed that you've been getting tired recently?

Have you felt you've been lacking in energy?

On how many days have you felt [tired / lacking in energy] during the past seven days?

- 0 \leq 3 days
- 1 \geq 4 days

Have you felt [tired / lacking in energy] for more than 3 hours on any day in the past week?

- 0 Less than 3 hours
- 1 More than 3 hours

Have you felt so [tired/lacking in energy] that you've had to push yourself to get things done during the past week?

- 0 No
- 1 Yes, on one or more occasion

Have you felt [tired/lacking in energy] when doing things that you enjoy doing during the past week?

- 0 No, not tired during enjoyable activities
 - 1 Yes, tired during one enjoyable activity
-

What's your explanation for feeling [tired/lacking in energy]?

- 1 Not known
- 2 Problems with sleep
- 3 Medication
- 4 Physical illness
- 5 Working too hard
- 6 Stress or other psychological reason
- 7 Other (specify)

coding for D/K

CONCENTRATION AND FORGETFULNESS

Recently, have you been able to concentrate on what you are doing or does your mind tend to wander?

Have you found that you have been forgetting things?

On how many days have you noticed problems with your [concentration / memory] during the past week?

0 \leq 3 days

1 \geq 4 days

Can you concentrate on a TV programme, read a newspaper article or talk to someone without your mind wandering?

0 Yes

1 No, cannot concentrate on one or more

Have you forgotten anything important in the past seven days?

0 No

1 Yes, has forgotten something important

Have you given up doing anything because you couldn't concentrate?

0 No

1 Yes

IRRITABILITY

Many people become irritable or short tempered at times, though they might not show it.

Have you been irritable or short tempered with those around you recently [for instance with your child(ren)]?

Do you ever get short tempered or angry over things which seem trivial when you look back on them?

What sort of things have made you [irritable/short tempered] in the past week?

On how many days have you felt [irritable/short tempered] during the past week?

- 0 \leq 3 days
- 1 \geq 4 days

Have you felt [irritable/short tempered] for more than one hour on any day in the past week?

- 0 Less than 1 hour
- 1 More than 1 hour

Have you felt so [irritable/short tempered] that you have wanted to shout at someone in the past seven days? Even if you haven't actually shouted.

- 0 No
- 1 Yes

Have you had any arguments, rows or quarrels or lost your temper with anyone in the past seven days? Was this justified?

- 0 No
- 0 Yes, but subject feels this was justified
- 1 Yes

WORRY ABOUT PHYSICAL HEALTH

If physically ill: Do you worry about your physical health?

Many people get concerned about their physical health.

Do you worry at all about YOUR physical health?

Do you find yourself worrying that you might have a serious illness like cancer, heart disease or AIDS?

On how many days during the past week have you found yourself worrying about your physical health?

0 \leq 3 days

1 \geq 4 days

Have you been worrying too much in view of your actual physical health?

0 No

1 Yes, worrying too much

How unpleasant has this worrying been in the past week?

0 Not at all

0 A little unpleasant

1 Unpleasant

Have you been able to take your mind off your health worries, for instance by doing something?

0 Yes

1 No, couldn't distract themselves one or more times

DEPRESSION

Almost everyone becomes low in mood or depressed at times.

Have you had spells of feeling low in mood, sad or miserable recently?

Have you been able to enjoy things as much as you do usually? Or no enjoyment.

What sort of things have you been getting [low etc] about? Code below line.

On how many days have you felt [low spirited, miserable, depressed, unable to enjoy things etc] in the past seven days?

- 0 On 2 or 3 days
- 1 On 4 or more days

In the past week have you been able to enjoy things as much as usual?

- 0 Yes, able to enjoy things
- 1 No, less enjoyment than usual
- 1 No enjoyment in anything

Have you felt [low spirited etc] for more than 3 hours on any day in the past week?

- 0 Less than 3 hours
- 1 3 hours or more

In the past week, when something nice happened or when you were in company, did this lift your mood?

- 0 Yes
- 1 No, on one or more occasion

7
0

CONTENT Which of these most affects your mood? Read out, if necessary. Code one item only.

1. members of family
 - spouse inc marriage/separation
 - children
 - others
2. relationships with friends or at work
3. housing
4. money
5. own physical health inc. pregnancy etc
6. own mental health
7. work or absence of work (inc. student)
8. legal difficulties
9. political issues

? add baby

SLEEP PROBLEMS

Have you been having problems with your sleep in the past week?

Has sleeping more than usual been a problem recently?

How many hours sleep did you [lose/gain] on the worst night you have had in the past week?

I want you to include sleep lost at the beginning, middle and end of the night.

- 0 < 15 minutes: go to next section, SLEEP = 0
- 1 < 1 hour
- 2 1 - 3 hours
- 2 > 3 hours

In calculating time lost from sleep, allow 15 minutes for the subject to return to sleep, if woken.

On how many nights in the past week have you had any problems with your sleep?

- 0 \leq 3 days
- 1 \geq 4 days

if applicable: On how many nights in the past week did you [lose/gain] more than 3 hours sleep?

- 0 1 - 3 nights
- 1 \geq 4 nights

Do you wake more than half an hour earlier than you need to and can't get back to sleep?

- No
 - Yes, but I can get back to sleep quickly
 - Yes, and I can't get back to sleep
-

What are your sleep difficulties caused by?

- 1 Noises (babies crying, busy roads etc.)
- 2 Shift work
- 3 Pain (which is not considered to be psychogenic)
- 4 Pain (which is considered to be psychogenic)
- 5 Worries or reason not known
- 6 To go to toilet

DEPRESSIVE IDEAS

If felt low etc during past week.

Some people find their mood affects their interest in sex. Has there been any change in your interest in sex recently?

- Not applicable
 No change
 Increase
 Decrease

In the past seven days have you felt guilty ... or have you blamed yourself when things have gone wrong even if it hasn't been your fault?

- 0 Never or only when it is interviewee's fault
 1 Sometimes
 1 Often

During the past week have you been feeling you are not as good as other people? For instance, that you are inferior or second-rate?

- 0 As good as anyone else
 1 Not as good as others
 1 Often

Have you felt hopeless at all during the past seven days, for instance about your future?

- 0 No
 1 Yes

If scored on this section:

In the past week, have you been feeling that life isn't worth living?

- 0 No
 1 Sometimes
 1 Always

if answered 1 above:

Have you thought of killing yourself IN THE PAST WEEK?

- 0 Has thought about it in the past
 0 No
 1 Has thought about it in the past week

thoughts of self harm

WORRY

Do you find yourself worrying more than you need to?

Have you had any worries at all recently?

What sort of things have you been worried about? Code below line.

On how many of the past seven days have you been worrying about things?

0 \leq 3 days

1 \geq 4 days

How unpleasant has your worrying been in the past week?

0 Not at all

0 A little unpleasant

1 Unpleasant

Have you worried for more than 3 hours on any day in the past week?

0 Less than 3 hours

1 3 hours or more

Have you been worrying too much in view of your circumstances?

0 No

1 Yes, worrying too much

CONTENT What is the thing you most worry about? Read out if necessary. Code one item only.

1. members of family
 - spouse inc marriage/separation
 - children
 - others
2. relationships with friends or at work
3. housing
4. money
5. own physical health SEE MANUAL
6. own mental health
7. work or absence of work (inc. student)
8. legal difficulties
9. political issues

ANXIETY

Have you been anxious or nervous recently?

Do you find your muscles feel tense or that you can't relax?

Is your [anxiety, tension, nervousness] only brought on by something specific?

If ONLY provoked by situation(s) or things, score under phobias,

On how many of the past seven days have you been [nervous etc]?

0 \leq 3 days

1 \geq 4 days

How unpleasant has your [anxiety, tension, nervous] been in the past week?

0 Not at all

0 A little unpleasant

1 Unpleasant

In the past week, when you've been [nervous, anxious, tense] have you had ANY of the following symptoms?

heart racing or pounding

feeling dizzy

butterflies in your stomach

hands sweating or shaking

difficulty getting breath

dry mouth

0 No

1 Yes

Have you felt [anxious, nervous, tense] for more than 3 hours on any day in the past week?

0 No

1 Yes, more than 3 hours

PHOBIAS

Some people get nervous or uncomfortable about specific things or situations even if there is no real danger, for instance:

speaking or eating in front of strangers	
the sight of blood	Heights
crowded shops	being far from home
spiders	

Are YOU nervous or anxious about any specific things or situations?

Code type of phobia: Which of these makes you MOST nervous or anxious?

1. Travelling alone by bus or train, Being far from home, Enclosed spaces, Being in crowds, e.g. crowded shops, Being alone in the house
2. Eating, speaking in front of strangers, Being watched or stared at, Any social situation
3. The sight of blood
4. Insects, spiders or animals, Enclosed spaces or heights, Any specific single cause
5. None of these

How many times in the past seven days have you felt nervous or anxious about [the situation/thing]?

None: skip next question, go to AVOIDANCE

0 \leq 3 times

1 \geq 4 times

Did you have ANY of the following symptoms?

heart racing or pounding	hands sweating or shaking
feeling dizzy	difficulty in getting breath
butterflies in the stomach	dry mouth

0 No

1 Yes

AVOIDANCE:

In the past week have you avoided [the situation/thing] because of your fear?

0 No

1 Yes

How many times have you avoided [the situation/thing] in the PAST SEVEN DAYS?

\leq 3 times

1 \geq 4 times

PANIC

Only ask if the subject has scored on anxiety or phobias

Does your anxiety or tension ever get so bad that you panic?

In other words, you feel you might collapse, lose control go crazy or even die unless you do something about it?

How often has this happened in the past week?

- 0 Not at all
- 1 Once
- 2 More than once

How unpleasant have these feelings of panic been in the past week?

- 0 A little uncomfortable
- 0 Unpleasant
- 1 Unbearable, very unpleasant

Did [this panic / the worst of these panics] last for longer than 10 minutes?

- 0 Less than 10 minutes
 - 1 More than 10 minutes
-

Are you relatively free of anxiety between these panics?

- Yes
- No

If phobia:

Is the panic always brought on by the [situation/thing]?

- Yes
- No

COMPULSIONS

Do you find that you keep on doing things over and over again even though you've already done them?

For instance, turning off taps, locking doors or windows, washing yourself...etc

What do you tend to repeat?

What is the GREATEST NUMBER of times you have repeated things you have already done in the past week?

- 0 One (i.e. 2 times altogether) or 2 times
- 1 3 or more times

On how many days in the PAST WEEK have you had to repeat things?

- 0 ≤ 3 days
- 1 ≥ 4 days

Have you tried to stop yourself repeating things in the past seven days?

- 0 No
- 1 Yes

Has repeating things, made you upset or annoyed with yourself in the past week?

- 0 Not at all
- 1 Upset or annoyed

OBSSESSIONS

Do you ever have unpleasant thoughts or ideas that you would prefer not to think about, but they still keep on coming into your mind?

I mean the SAME thought or idea, over and over again rather than worrying around a subject.

What are these thoughts? Don't press people to answer.

On how many days in the past seven days have you had these distressing thoughts?

0 \leq 3 days

1 \geq 4 days

Have you tried to stop yourself thinking these thoughts in the past seven days?

0 No

1 Yes, tried to stop thoughts

Have you become upset or annoyed with yourself when you have had these thoughts in the past week?

0 Not at all

1 Upset or annoyed

What is the longest time you have spent thinking these thoughts, in the past week?

0 $<$ 15 mins

1 \geq 15 mins

ELATION

Do you ever feel VERY cheerful, more cheerful than usual or on top of the world for no apparent reason?

Do you get periods when you are full of energy and have exciting ideas?

On how many days have you felt like this in the past week?

0 \leq 3 days

1 \geq 4 days

Has this feeling been pleasant or unpleasant in the past week?

0 Pleasant

1 Unpleasant

Has your mind been so active that you couldn't stop your thoughts racing, when you have been [very cheerful, full of energy]?

0 Can stop racing thoughts

1 Can not stop thoughts racing

When you were feeling [very cheerful, full of energy] in the past week, did you think that you were better than other people or had special skills?

0 Felt same as other people

1 Felt better than other people

Have you been needing less sleep?

Code in SLEEP section if not already elicited

IDEAS OF REFERENCE

Do you ever get the feeling that strangers are taking special notice of you when you are in public?

Has this been upsetting or has it made you angry, worried or nervous over the past week?

- 0 Not at all: move to next section
 - 1 Upset, angry, nervous or worried in past week
-

On how many days in the past seven days have you had this feeling?

- 0 \leq 3 days
- 1 \geq 4 days

When you are in public do you sometimes feel that people are saying things about you or laughing at you?

- 0 People only look at or take notice of subject
- 1 Feels they also say things about and/or laugh at subject

If answers 1: Are these people really talking about you - or is it just a feeling you have?

- 0 Just a feeling
 - 1 Belief in ideas of reference
-

Do you tend to feel nervous in public?

Have you avoided public places or meetings recently?

Return to phobias section if social phobia not already elicited

COPING STYLE QUESTIONNAIRE

Below is a series of statements about attitudes to problems and how to solve them. Please complete the questionnaire by filling in the box which corresponds most closely to your opinion. The questionnaire asks you to say how strongly you agree with each statement. The questionnaire is seeking your opinions - but there are no right or wrong answers.

		Strongly Disagree	Disagree	Agree	Strongly Agree
1.	I am at least as good as the next person.				
2.	I will never be able to stop feeling upset.				
3.	I can think of someone who needs me.				
4.	Any problems I have will be solved in the end.				
5.	No-one really cares for me.				
6.	Taking an overdose or harming myself is sometimes the only way out of my problems.				
7.	I am able to cope with most problems.				
8.	Taking an overdose or harming myself is a good way of showing people how upset I am.				
9.	Talking about my problems helps.				
10.	Hospitals have a duty to look after me when I am upset.				

Suicide during pregnancy and in the first postnatal year

Louis Appleby

Abstract

Objectives—To calculate age adjusted mortality ratios for suicide by women in the first year after childbirth and during pregnancy, and to identify characteristics of postnatal suicide in childbearing women.

Design—Retrospective study based on population data for England and Wales from 1973 to 1984.

Subjects—Women aged 15-44 who committed suicide in the year after childbirth or during pregnancy.

Main outcome measures—Observed to expected mortality ratios for the total postnatal sample, for five year age groups, for unmarried mothers, and for suicide after stillbirth; observed to expected mortality ratios for all suicides during pregnancy and for five year age groups; the timing of suicides in relation to delivery; and the frequency of the various methods of suicide.

Results—The standardised mortality ratio for postnatal suicide was calculated to be 0.17—that is, the actual total was only one sixth of that expected. The low ratio was not found after stillbirth, which was associated with a rate six times that in all women after childbirth. The low ratio was less pronounced, but still present, in teenage mothers and in unmarried mothers. Women who committed suicide after childbirth most often did so in the first month, and there was a tendency to use violent methods. The standardised mortality ratio for suicide during pregnancy was calculated to be 0.05 of all pregnant women. Teenagers were at substantially increased risk.

Conclusions—Women in the first year after childbirth and during pregnancy have a low risk of suicide despite their high rate of psychiatric morbidity. Underreporting of maternal suicides is unlikely to explain the findings, though it may affect their magnitude. Motherhood seems to protect against suicide. Concern for dependants may be an important focus for suicide prevention in clinical practice.

Introduction

Increased rates of psychotic disorder and neurotic depression in women after childbirth have frequently been reported.^{1,4} A high rate of postnatal suicide might therefore be predicted. In pregnancy, although psychosis is rare,¹ neurotic disorders are common² and might similarly predict an increased suicide rate. This paper calculates the risk of suicide in the first postnatal year and during pregnancy by using population data for England and Wales from 1973 to 1984.

Previous attempts to study the relation between pregnancy and suicide in a locality have calculated the proportion of all women who commit suicide who are pregnant and have not adjusted for the effects of age.⁵ This study examines the effects of age and time trends on suicides in childbearing women. Some other characteristics of postnatal suicide are also examined.

Methods

Age standardised mortality ratios for suicides by women after childbirth and during pregnancy were calculated using the data sources and definitions listed below. In each case the data were broken down into five year age bands from 15 to 44 and into three year periods from 1973 to 1984.

Suicides in the general female population—Annual records of deaths by suicide and deaths in which cause—that is, accident or self harm—was undetermined were provided by the Office of Population Censuses and Surveys. It is conventional in statistical studies of suicide to regard the actual number of suicides as the sum of recorded suicides and recorded deaths of undetermined cause.

Population—Annual mid-year estimates of the female population of England and Wales stratified by age were provided by the Office of Population Censuses and Surveys.

Rates of suicide in women—The annual suicide rate per 100 000 population was calculated for each age and period from the female suicides and population totals.

Births—Both livebirths and stillbirths were included in the postnatal calculation. The Office of Population Censuses and Surveys provided total numbers of births in England and Wales for each year stratified by age and marital state of the mothers. In calculating the rate during pregnancy the number of births was used rather than the number of conceptions so that the eventual mortality ratio would not artificially be lowered by the inclusion of pregnancies which ended in miscarriage or abortion. The expected total numbers of suicides, being based on annual estimates, were then multiplied by 34/52 to adjust for the time during which a woman knows she is pregnant (assumed in this study to be 34 weeks).

Method of standardisation—The expected number of suicides in women after childbirth was calculated as the rate of suicide in women multiplied by the number of births. This calculation was carried out for each age group and time period.

Observed number of postnatal suicides—Details of all deaths in pregnancy and in the first postnatal year, classified by cause, are published every three years in the *Report on Confidential Enquiries into Maternal Deaths in England and Wales*.⁶ Cases are identified from death certificates completed by general practitioners and coroners and forwarded by district medical officers and the Office of Population Censuses and Surveys. Deaths are then recorded in three categories according to their relation to childbirth—namely, direct, indirect, and fortuitous. Suicides are either indirect or fortuitous, depending on the presumed influence of childbirth and pre-existing psychiatric illness. For each three year period the Department of Health provided additional information on maternal suicide, including age, marital state, obstetric outcome, timing of death in relation to delivery, method of suicide, coroner's verdict, and known psychiatric history. In this study maternal

suicides included all of those listed by the Department of Health as suicide, except three cases in which the coroner's verdict was accidental death and one in which no inquest was held. In the remaining cases the coroner's verdict was either suicide, open, or misadventure, the last two corresponding to deaths of undetermined cause. Two suicides after legal abortion were excluded.

Mortality ratios—Ratios of observed to expected numbers of suicides were calculated for each three year period (all ages) and, separately, for each five year age band (all periods). An overall standardised mortality ratio was calculated after adding the individual age specific and period specific observed and expected numbers of suicides to produce total observed and expected numbers.

Results

SUICIDE IN FIRST POSTNATAL YEAR

Mortality ratios

Age standardised mortality ratios for each three year period were calculated. A test for heterogeneity⁷ showed the variation over time to be insignificant ($\chi^2=4.7$, $df=3$, $p=0.2$). An overall standardised mortality ratio was therefore calculated as the sum of observed suicides divided by the sum of expected suicides=0.17 (95% confidence interval 0.14 to 0.21).

Table I shows the mortality ratio for each five year age band standardised for time. A test for heterogeneity showed no overall significant differences in the ratios ($p=0.4$), although the observed to expected ratio was highest in teenagers and generally declined with age. On testing for trend this decline failed to reach statistical significance ($p=0.17$).

TABLE I—Observed to expected ratios for postnatal suicide (1973-84). Results standardised for time period

	Age (years)					
	15-19	20-24	25-29	30-34	35-39	40-44
Observed	7	24	25	13	6	1
Expected	19.6	127.6	165.9	92.3	35.8	8.4
Observed:expected	0.357	0.188	0.151	0.141	0.168	0.119

Test for heterogeneity: $\chi^2=5.27$, $df=5$, $p=0.4$.

TABLE II—Numbers of suicides in each four week period of year after childbirth (1973-84)

Four week period after childbirth	1	2	3	4	5	6	7	8	9	10	11	12	13	Total
No of suicides	18	5	8	7	11	7	5	3	3	2	2	1	3	75*

*In one case timing of suicide after childbirth was not recorded.

TABLE III—Methods of suicide among 76 women in year after childbirth

	Observed	Expected	Observed: expected	95% Confidence interval*
Overdose	32	41.5	0.8	0.5 to 1.1
Jumping from height	11	4.3	2.5	1.3 to 4.6
Self incineration	9	2.2	4.0	1.8 to 7.8
Drowning	8	5.7	1.4	0.6 to 2.8
Hanging	8	7.8	1.0	0.4 to 2.0
Jumping or lying in front of train	7	3.3	2.1	0.8 to 4.4
Self poisoning (not overdose)	1	3.4	0.3	0.01 to 1.6

*Confidence intervals from tables of means of Poisson distribution.

TABLE IV—Observed to expected ratios for suicide during pregnancy (1973-84)

	Age (years)					
	15-19	20-24	25-29	30-34	35-39	40-44
Observed	5	3	4	2	0	0
Expected	17.4	88.0	101.7	51.4	18.8	4.2
Observed:expected	0.280	0.034	0.039	0.039	0	0

Test for heterogeneity: $\chi^2=20.35$, $df=5$, $p=0.001$.

Timing of postnatal suicide

Table II shows the timing of the suicides in relation to delivery. Seventy five of the 76 suicides over the 12 years are included, the timing of suicide in one case having not been recorded. The data are presented as the number of suicides in each four week period of the first postnatal year. The mean monthly (that is, four weekly) figure was 5.8. The expected age standardised monthly mean was 34.6. The actual monthly total varied widely with a large peak in the first month after delivery and a smaller possible peak at around five months. Even during the first month the number of suicides (18) was little more than half the rate expected from the general female population. After the second month the numbers of suicides declined and remained at roughly one tenth of the expected number during the rest of the year.

Other characteristics of postnatal suicide

Stillbirths—Four of the women in the sample had had stillbirths (expected number in 76 births=0.62). The standardised mortality ratio for suicide after stillbirths was calculated to be 1.05 (95% confidence interval 0.39 to 2.79)—that is, the rate was the same as in the general female population, therefore six times the rate in all women after childbirth.

Marital state—In 17 of the 76 suicides the women were unmarried (single, separated, or divorced). The standardised mortality ratio for suicide among unmarried mothers in the first year was calculated to be 0.40 (95% confidence interval 0.25 to 0.64). The rate of suicide in unmarried mothers was therefore less than half the rate in the general female population but more than twice the rate in all women after childbirth.

Psychiatric history—The *Report on Confidential Enquiries into Maternal Deaths in England and Wales* recorded a past or current psychiatric disorder in 48 of the 76 cases—that is, a proportion of 0.63. No further details were recorded, so that this figure is comparatively crude.

Method of suicide—Table III shows the methods of suicide compared with figures published by the Office of Population Censuses and Surveys on suicides and deaths of undetermined cause during 1974-84 (a publication in 1973).⁸ The expected figures were based on the rate of suicide (including deaths of undetermined cause) in the total female population aged 15-44 during 1974-84. Suicides by burning and by jumping in front of a train were listed individually from 1979: the expected figures for these methods were therefore based on the female population aged 15-44 from 1979 to 1984. The observed to expected ratios suggested a high rate of dramatic methods of suicide, particularly self incineration, jumping from a height, and jumping in front of a train.

SUICIDE DURING PREGNANCY

Table IV shows the observed and expected number of suicides during pregnancy in the study period. A total of 14 suicides were reported in the 12 years compared with an expected 281.5, giving an observed to expected mortality ratio of 0.05 (95% confidence interval 0.029 to 0.084)—that is, pregnant women had one twentieth of the expected rate of suicide. There was a significant age effect. The mortality ratio for teenage pregnant women was 0.28 so that, although at low risk compared with teenage non-pregnant women, this group carried a risk 8 times greater than pregnant women as a whole (test for heterogeneity: $\chi^2=20.35$, $df=5$, $p=0.001$). The numbers were too small to draw substantial conclusions about timing or method. Nevertheless, 8 suicides (eight of the 14) occurred in the second trimester. A psychiatric history was recorded in 5 cases but in only one of the five cases in teenagers.

Discussion

The principal finding of this study was a standardised mortality ratio for postnatal suicide of 0.17. At a time of high psychiatric morbidity the rate of suicide was roughly six times lower than expected in the matched female population. Possible explanations are considered below.

ERROR AND CHANCE

The accuracy of the low mortality ratio depends on the completeness of the numerator—that is, the maternal suicide sample. How comprehensive, then, was the method of data collection?

The *Report on Confidential Enquiries into Maternal Deaths in England and Wales* estimates that 99% of all direct puerperal deaths (that is, deaths in the first six weeks) and a slightly lower percentage of indirect puerperal deaths are included in its sample.⁶ Data on late deaths (after six weeks) and fortuitous deaths are less complete but the exact extent of underreporting is unknown. So it is possible that the low mortality ratio, or certainly the low number of maternal suicides after seven months, might have been the result of incomplete sampling. Several points, however, militate against this. Only if 83% of maternal suicides had been missed would the low ratio be cancelled out, and even greater underreporting would be needed to give a suicide rate consistent with the high rate of postnatal morbidity. Secondly, during the first postnatal month, when major morbidity is at a peak and suicide reporting relatively complete, the observed number of suicides was still well below the expected number (18 as opposed to 34.6). Thirdly, the pattern of maternal suicide, including the fall in cases after seven months, might satisfactorily be explained by the known pattern of maternal morbidity. Fourthly, most equivocal cases supplied by the *Report on Confidential Enquiries into Maternal Deaths in England and Wales* were included in the calculation.

An accurate check on the completeness of the data on suicides would require extensive cross matching of birth and death registers and would itself be a substantial study with its own methodological flaws. A simpler method is to select a fatal condition that could not influence or be influenced by fertility or childbirth (this excludes vascular disease, accidents, and tumours) and carry out an analogous calculation of the expected number of deaths in the childbearing population. This was done for meningitis during 1976-81. The expected number of deaths was 2.4; the observed number was 2. Such small figures can be only minor evidence, but it may be significant that there was no large discrepancy, as there was with suicide.

The 95% confidence interval of the standardised mortality ratio (0.14 to 0.21) makes it unlikely that such a low ratio would be a statistical artefact.

LOW PSYCHIATRIC MORBIDITY

Recently the reported excess of neurotic depression in the first few months after childbirth^{2,4} has been questioned,^{9,10} but there is no evidence of any postnatal decline in the rate of depression. Furthermore, the rate of psychotic illnesses increases dramatically in the puerperium.¹ The low standardised mortality ratio is therefore unlikely to reflect a low rate of morbidity.

HEALTHY SAMPLE

Except with respect to marital state there was no information on whether the childbearing population in 1973-84 was low in risk factors for depression or suicide—for example, a psychiatric history. As for marital state itself, the rate of suicide in unmarried mothers alone was well below the rate in the general female population (standardised mortality ratio 0.4).

The remaining two explanations accept that women

after childbirth are protected against the expected risk of suicide despite high psychiatric morbidity.

FAMILY AND PROFESSIONAL SUPPORT

The first postnatal year is a time of close contact with health professionals and family or friends. It may be that the risk of suicide is reduced by early detection and close support. Table II, however, shows the highest risk of suicide to occur in the first postnatal month, probably the time of greatest contact with professionals and support from family members.

PROTECTIVE EFFECT OF MOTHERHOOD

The remaining explanation is that being a mother is in itself protective against suicide. An American study of reasons for living¹¹ found that in a sample of psychiatric inpatients those who had had suicidal thoughts and those who had actually carried out a parasuicidal act were distinguished by "child-related concerns." Specifically, these were (a) that suicide would harm the children, (b) that it would not be fair to leave the children to the care of someone else, and (c) a desire to watch the children grow up. Such a result is in keeping with the large volume of research on cognitive aspects of depression.¹²

Could the same concerns about the children exert a protective effect on women in the first year after childbirth? There seems to be supportive evidence in this sample. Firstly, the absence of a low mortality ratio after stillbirth supports the presence of young children as the crucial protective influence. Each of the four stillbirths was a first pregnancy, so no older children could compensate. Secondly, the continuing low risk of suicide at the end of the first postnatal year (table II) would be expected if concerns over young children were indeed protective. Thirdly, the data suggest (but do not prove) that many of the suicides occurred during psychosis—for example, the peak during the first month coincided with the peak of onset of psychosis,¹³ and the methods used were more dramatic than expected. It may be during acute psychosis that rational child concerns are most disrupted.

Similarly, suicide during pregnancy does not mirror either the rate or the timing of neurotic disorders. It is a rare event throughout pregnancy, including during the first trimester, when non-psychotic morbidity is common.² The very low mortality ratio during pregnancy, when child related concerns should be at their most direct, supports the conclusion that such concerns are a powerful influence on risk of suicide. Under-reporting of suicides to the confidential enquiries into maternal deaths is thought to be fairly insignificant in pregnancy.

Although the prevalence of suicide in the general population increases with age, within the population of pregnant women teenagers seem to be at considerably greater risk. Most of the suicides in teenagers in this study were in women who had no recorded past or recent psychiatric history; this differs from the setting in older women, which suggests that any link between psychosis and suicide in this population may not apply to teenage women. The explanation may be that as pregnancy seems to be more often unwanted among teenagers (the abortion rate is higher¹⁴) the negative impact of becoming pregnant is likely to be greater and the protective effect of motherhood reduced. If this is so, teenagers who are unhappy about being pregnant represent a high risk group within a low risk population.

Conclusions

Despite theoretical justification, the low risk of suicide in childbearing women should be confirmed

with further studies. One method already mentioned is a cross matching of national birth and death registers, which should become easier once a computer link exists to allow a detailed comparison of information about subjects listed. Another approach is to use regional obstetric registers or national census data to relate death by suicide to child birth or child age. These methods are currently being pursued.

If the low risk is confirmed, then more exploration of the possible reasons would be valuable. If there is a large protective effect of motherhood based on concern for the welfare of dependants such concern would be an important focus for suicide prevention work, both with postnatal patients and with others at risk.

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Antibody to coxsackie B virus in diagnosing postviral fatigue syndrome

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Abstract

Objective—To study the association between coxsackie B virus infection and the postviral fatigue syndrome and to assess the immunological abnormalities associated with the syndrome.

Design—Case-control study of patients with the postviral fatigue syndrome referred by local general practitioners over one year.

Setting—General practitioner referrals in Dunbartonshire, Scotland.

Patients—254 Patients referred with the postviral fatigue syndrome (exhaustion, myalgia, and other symptoms referable to postviral fatigue syndrome) and age and sex matched controls obtained from same general practitioner; 11 patients were rejected because of wrong diagnoses, resolution of symptoms, and refusal to participate, leaving 243 patients and matched controls.

Main outcome measures—Detailed questionnaire (patients and controls) and clinical examination (patients) and blind analysis of blood sample at entry and after six months for determination of coxsackie B virus IgM and IgG antibodies and other variables (including lymphocyte protein synthesis, lymphocyte subsets, and immune complexes).

Results—Percentage positive rates for coxsackie B virus IgM at entry were 24.4% for patients and 22.6% for controls and for coxsackie B virus IgG 56.2% and 55.3% respectively; there were no significant differences between different categories of patients according to clinical likelihood of the syndrome nor any predictive value in a fourfold rise or fall in the coxsackie B virus IgG titre in patients between entry and review at six months. The rates of positive antibody test results in patients and controls showed a strong seasonal variation. Of the numerous immunological tests performed, only a few detected significant abnormalities; in particular the mean value for immune complex concentration was much

higher in 35 patients and 35 controls compared with the normal range and mean value for total IgM was also raised in 227 patients and 35 controls compared with the normal range.

Conclusions—Serological tests available for detecting coxsackie B virus antibodies do not help to diagnose the postviral fatigue syndrome. Percentage positive rates of the antibodies in patients simply reflect the background in the population as probably do the raised concentrations of total IgM and immune complexes.

Introduction

Since 1934 numerous outbreaks of a curious defined illness showing similarities in presentation, clinical picture, and outcome have been reported throughout the world under various synonyms, the most recent being the postviral fatigue syndrome or the chronic fatigue syndrome.^{1,4} Outbreaks of this illness have been associated with increased antibody titres to coxsackie B virus.^{5,9} One of us (HC) noted that between 1980 and 1984 the annual referral rate to medical outpatients in Dunbarton district thought to have the postviral fatigue syndrome more than quadrupled and seemed to be associated with high positive rates of coxsackie B IgG antibodies (about 40% each year) compared with the previously reported background rate of positive tests.¹⁰ With the advent of a coxsackie B virus IgM antibody test the present prospective trial was set up to assess any association between the postviral fatigue syndrome and coxsackie B virus infection and to examine immunological abnormalities previously described in this syndrome.

Materials and methods

Patients and controls

During one year starting on 1 May 1985 local general practitioners were asked to refer patients with

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