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Abstract

Background: There is converging evidence that between 1 and 3% of women develop posttraumatic stress disorder (PTSD) after childbirth. Various vulnerability and risk factors have been identified, including mode of birth and support during birth. However, little research has looked at the role of adult attachment style in how women respond to events during birth. This study prospectively examined the interaction between attachment style, mode of birth, and support in determining PTSD symptoms after birth. **Method:** A longitudinal study of women (n=57) from the last trimester of pregnancy to 3 months postpartum. Women completed questionnaire measures of attachment style in pregnancy and measures of PTSD, support during birth, and mode of birth at three months postpartum. **Results:** Avoidant attachment style, operative birth (assisted vaginal or caesarean section) and poor support during birth were all significantly correlated with postnatal PTSD symptoms. Regression analyses showed that avoidant attachment style moderated the relationship between operative birth and PTSD symptoms, where women with avoidant attachment style who had operative deliveries were most at risk of PTSD symptoms. **Limitations:** The study was limited to white European, cohabiting, primiparous women. Future research is needed to see if these findings are replicated in larger samples and different sociodemographic groups. **Conclusions:** This study suggests avoidant attachment style may be a vulnerability factor for postpartum PTSD, particularly for women who have operative births. If replicated, clinical implications include the potential to screen for attachment style during pregnancy and tailor care during birth accordingly.

Introduction

Research suggests childbirth can be traumatic for some women, with evidence that between 1 and 7% of women report PTSD in relation to childbirth, and more women report symptoms but do not fill all diagnostic criteria (Alcorn, O'Donovan, Patrick, Creedy, & Devilly, 2010; Ayers & Pickering, 2001). Postpartum PTSD is highly comorbid with depression (White, Matthey, Boyd, & Barnett, 2006) and there is evidence it impacts on the couple's relationship (Iles, Slade, & Spiby, 2011), parent-baby bond (Parfitt & Ayers, 2009), and possibly child development (Parfitt, Pike & Ayers, in press). Research on the etiology of postpartum PTSD has identified a range of vulnerability, risk and protective factors during and after birth, such as previous psychiatric problems, history of trauma, severe complications during birth, women's subjective experiences of birth, and support (Andersen, Melvaer, Videbech, Lamont, & Joergensen, 2012). These are similar to risk factors found in other populations, which suggests some comparability between postpartum PTSD and PTSD following other events. However, childbirth involves some unique aspects, including the physiological processes of labor and birth, and that birth occurs in a particular social context – usually in hospital – where women are supported by a birth partner and healthcare professionals.

Charuvastra and Cloitre (2008) proposed a social ecological framework of PTSD, where a person's attachment style and a history of child abuse or adversities moderate how they respond to trauma. This is thought to occur by altering a person's expectations of support and compromising their ability to regulate emotions. Attachment was defined by Bowlby (1969) as the relationship a child has with their caregiver, which is biologically driven to maximize protection and security. Attachment behaviours include stress responses and exploratory behavior and are shaped by cognition, affect, and interaction with the caregiver. Early attachment provides an 'internal working model' that guides relational

behavior and expectations as an adult, and forms the basis for adult romantic attachments (Rholes & Simpson, 2004). Attachment styles can be secure or insecure. Insecure attachment styles that have been proposed include anxious, avoidant, fearful, unresolved, ambivalent, disorganized, preoccupied and dismissing. Factor analysis has identified anything from one to four attachment types (Armour et al., 2011) and the majority of research focusing on anxious and avoidant styles.

There is significant evidence to support the social ecology model of PTSD; meta-analyses show poor support is associated with PTSD (Brewin, Andrews, & Valentine, 2000; Ozer, Best, Lipsey, & Weiss, 2003). Adult attachment style is also associated with mental health. Population studies show disordered attachment styles are more prevalent in people with psychological disorders (Bakermans-Kranenburg & Van Ijzendoorn, 2009). Similarly, attachment style has been associated with PTSD in various populations (Armour, Elklit, & Shevlin, 2011; O'Connor & Elklit, 2008). However, evidence is inconsistent on which type of disordered attachment style is most predictive of PTSD. This is partly due to differences in how attachment style is conceptualized and measured.

Attachment style and its interaction with social support and event severity are highly relevant to postpartum PTSD but little research has examined this. In one study of 212 couples, postpartum PTSD was associated with anxious attachment style (Iles, Slade, & Spiby, 2011). Studies of postpartum depression have also found that insecure attachment plays a role in the maintenance of depression after birth (McMahon, Barnett, Kowalenko & Tennant, 2005).. This suggests attachment style is important in postpartum mental health and provides preliminary evidence it may influence PTSD responses to birth. A number of issues remain. First, birth differs from other traumatic stressors in that it is only traumatic for some women. Women who have high levels of intervention or complications during birth at greater risk of PTSD (Andersen et al., 2012). The severity of events in birth should therefore be

taken into account when looking at the relationship between attachment style and PTSD. Second, the support received (or not) during birth may be important in traumatic stress responses to birth. For example, Ford & Ayers (2011) found that support during birth interacted with birth intervention to predict PTSD three months after birth.

The current study examines the interaction between women's attachment style, severity of birth, and support during birth in postpartum PTSD. Because birth is not traumatic for most women, we propose that attachment style will be associated with PTSD only in women who have severe complications or interventions during birth.

Method

This research formed part of the Journey to Parenthood study (Parfitt & Ayers, 2012), a prospective longitudinal study of 76 women and 65 of their partners. Inclusion criteria were that couples were expecting their first baby, were cohabiting, fluent in English and over 18 years old. Participants completed questionnaires in late pregnancy (>30 weeks gestation) and three months postpartum. The pregnancy questionnaire included measures of demographic characteristics and attachment style. The postpartum questionnaire included measures of PTSD, support during birth and birth outcomes. Response rates were 90% in pregnancy and 77% postpartum. Comparison of participants who completed the study with participants who only completed part of the study found no difference on demographic or other variables, with the exception that participants who did not complete all time-points were more likely to be of a non-white European origin ($\chi^2 (1) = 5.66, p = .02$).

Only women who completed the postpartum PTSD questionnaire were included (n = 57; 75%). Women were aged 25 to 46 years (mean 33.20 years, SD = 5.03); the majority were white European (89.6%). Many were educated to university level (41.1%). Personal income was <£20,000 a year for 49% of women, and >£40,000 for 6%. For the majority of women (80%) the pregnancy was planned and time to conceive ranged from 1 to 120 months

(mean 13 months, SD 24.7). Six percent of women had fertility treatment and none reported previous stillbirth, although 16.7% had experienced miscarriage. During birth, there were higher levels of assisted and caesarean births than UK norms (vaginal birth 41.1%, assisted vaginal birth 21.4%, emergency caesarean 32.1%, elective caesarean 5.4%), which may be because women were primiparous.

Ethical approval was gained from the NHS Local Research Ethics Committee.

Women were recruited through community and hospital antenatal clinics or classes, and local advertisements. Eligible women were given an information sheet and asked to participate. If they agreed, they were given consent forms and the first set of questionnaires which were completed at the time or taken home. Volunteers who responded to adverts were sent information, consent forms and the first set of questionnaires to complete and return via prepaid mail. Hospital records were checked to ascertain when women gave birth. The second set of questionnaires was sent eight weeks after birth.

Measures

Adult attachment style was measured using the Adult Attachment Questionnaire (Simpson, Rholes, & Phillips, 1996) which has subscales of avoidant attachment (i.e. negative views of others, tendency to avoid/withdraw from intimacy in relationships; $\alpha = .83$) and ambivalent-anxious attachment (i.e. negative self-views regarding relationships, excessive preoccupation with abandonment, loss and partners' levels of commitment; $\alpha = .79$). Complications/Intervention during birth was measured using type of birth i.e. women who had operative births (assisted vaginal deliveries or caesarean sections, $n = 34$) compared to those who had spontaneous vaginal deliveries ($n = 23$). Birth support was measured using the support subscale of the Support and Control in Birth questionnaire (Ford, Ayers, & Wright, 2009; $\alpha = .90$). PTSD was measured using the PTSD Diagnostic Scale (Foa, Cashman, Jaycox, & Perry, 1997) in relation to childbirth. The re-experiencing, avoidance,

and hyper-arousal symptoms subscales follow DSM-IV symptom criteria and were combined to provide a total PTSD symptom score ($\alpha = .89$).

Analyses

Data screening identified a multivariate outlier so this participant was removed prior to analyses. PTSD scores were not significantly associated with demographic variables (age, ethnicity, marital status, level of education) with the exception of personal income ($r = -.33$, $p = .02$). Controlling for personal income in multivariate analyses did not alter the pattern of results so is not reported further.

Results

PTSD was significantly correlated with avoidant attachment style ($r = .35$, $p = .008$), mode of birth ($r = .41$, $p = .002$) and birth support ($r = -.27$, $p = .04$) but not ambivalent-anxious attachment ($r = .23$, $p = .09$). Ambivalent-anxious attachment style was therefore not entered into subsequent regression analyses. Hierarchical multiple regression analysis was used to explore (i) whether attachment, birth type and birth support influenced mothers' PTSD scores and (ii) whether attachment moderated any impact of birth type or birth support on PTSD (see Table 1).

At step 1, avoidant attachment accounted for 12.30% of the variance in PTSD scores ($F(1, 54) = 7.58$, $p = .008$); a more avoidant attachment style was associated with more PTSD symptoms. When mode of birth was entered at step 2, it accounted for an additional 14.49% of the variance ($\Delta F(1, 53) = 10.49$, $p = .002$); women who had a spontaneous vaginal birth experienced lower levels of PTSD. By contrast, when birth support was entered into the model at step 3, it failed to significantly increase the amount of variance in PTSD scores accounted for ($\Delta F(1, 52) = 2.82$, $p = .10$; $\Delta R^2 = .04$), and birth support did not emerge as a significant predictor of PTSD. The inclusion of the two-way interaction between avoidant attachment style and birth type into the model (step 4) significantly increased the

amount of variance in PTSD scores accounted for ($\Delta F(1, 51) = 6.12, p = .02; \Delta R^2 = .07$), indicating that avoidant attachment style moderated the impact of birth type on PTSD. The inclusion of the remaining interaction terms failed to significantly increase the variance in PTSD scores accounted for by the model (see Table 1; all ΔF s $< .90, p$ s $> .34$).

To explore the significant interaction further, separate regression analyses were conducted for women who experienced spontaneous vaginal deliveries and operative deliveries respectively, with PTSD scores regressed onto actual (i.e., non-mean-centered) avoidant attachment style scores (Figure 1). For women who had a spontaneous vaginal birth there was no significant effect of avoidant attachment style on PTSD ($F(1, 21) = 1.34, p = .26; \beta = .25$). In contrast, when women had an operative birth, avoidant attachment style accounted for 21.30% of the variance in PTSD scores ($F(1, 31) = 8.39, p = .007; \beta = .46$).

Follow-up analyses (Aiken & West, 1991) demonstrated that women high in avoidant attachment style (i.e. scoring 1 SD above the mean) who had an operative birth had significantly more PTSD symptoms than those who had a spontaneous vaginal birth ($\beta = .62, p < .001$). There was no significant difference between the PTSD scores of women experiencing spontaneous vaginal or operative deliveries when avoidant attachment style scores were low (1 SD below the mean) ($\beta = .14, p = .38$).

Discussion

This study is the first to examine the interaction between attachment style, birth support and mode of birth on postpartum PTSD. Results found that PTSD symptoms were correlated with avoidant attachment style, birth support and mode of birth. This supports the social ecology model of PTSD (Charuvastra & Cloitre, 2008) and its application to childbirth. Analyses showed women's responses to operative birth were moderated by attachment style, where women with avoidant attachment style who had operative births were at greatest risk

of PTSD. In contrast, ambivalent-anxious attachment style was not significantly associated with PTSD.

Results are consistent with research showing the importance of attachment style to mental health (Bakermans-Kranenburg & Van Ijzendoorn, 2009), PTSD (Armour et al., 2011; Besser & Neria, 2010), and postpartum mental health (McMahon et al., 2005). However, the finding that avoidant attachment style was most strongly associated with PTSD is inconsistent with research finding anxious or fearful attachment styles are mostly associated with PTSD (Armour et al., 2011; Besser & Neria, 2010; Iles et al., 2011) but consistent with some other studies, for example, looking at attachment and PTSD responses to HIV (Gore-Felton, Ginzburg, Chartier, Gardner, Agnew-Blais, McGarvey, Weiss & Koopman, 2013). This discrepancy could be due to the measure used in this study not focusing purely on anxious attachment but ambivalent-anxious attachment style, i.e. negative self-views regarding relationships, excessive preoccupation with abandonment and partners' levels of commitment. Nonetheless, this study suggests avoidant attachment style is important in responses to childbirth. The avoidant attachment style questionnaire included items such as 'I find it difficult to trust others completely', and 'I'm not very comfortable having to depend on others'. The interaction with operative birth to increase risk of PTSD seems plausible, as difficulty trusting or depending on others is critical in operative births, where women must rely on healthcare professionals.

Strengths of the study include the prospective design where attachment style was measured in pregnancy and PTSD was measured three months after birth. Limitations are that the sample predominantly comprised white European, cohabiting, primiparous, older women, and was only powered to identify medium to large effects. The study should therefore be extended to larger samples, including other sociodemographic and obstetric groups.

In conclusion, this study provides evidence that attachment style may be a risk factor for PTSD, and women with avoidant attachment style who have operative births may be at greatest risk. The results support the social ecology model of PTSD (Charuvastra & Cloitre, 2008) but the dimension of disordered attachment associated with PTSD differs between studies so requires clarification. Nonetheless, this study provides preliminary data that advances our understanding of the role of attachment style in postpartum PTSD. If replicated, clinical implications include the potential to screen for attachment style during pregnancy and tailor care during birth accordingly.

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