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MIDWIFE MANAGED DELIVERY UNIT: A RANDOMISED CONTROLLED COMPARISON WITH CONSULTANT LED CARE - THE COST DATA

This briefing paper provides results from a study of costs which took place alongside a randomised trial of midwife managed care. The trial, carried out in Aberdeen Maternity Hospital, compared care and delivery of low-risk women in the Midwives Unit with that in the consultant led Labour Ward. The method used in the main trial and the morbidity results were described in the second paper of this series.

Study Aim
The objective of the costing study was to investigate whether there are differences between the cost of intrapartum care for low-risk women in a midwife managed delivery unit and that in a consultant led labour ward.

1. METHODS

Identifying costs

The study concentrated on health care resource use largely within the hospital. While it was recognised that intrapartum care may influence resource use in other areas, such as community care, evaluation of these areas was outwith the scope of this project.

Costs were classified into four main groups:
- staff costs
- consumables
- capital costs
- overheads

The aim was to establish differences in these categories of costs when comparing care in the Midwives Unit and in the Labour Ward.

Data collection

Data collection was divided into the following two phases:
- data collection within the clinical trial
- data collected outwith the clinical trial

Methods of data collection

Phase I - within the trial
- Staff questionnaire
- Client questionnaire
- Casenote review
- Scottish Morbidity Register forms (SMR2)
- Aberdeen Maternity and Neonatal database.

Phase II - outwith the trial
- Hospital statistics
- Administrative data on costs of different services and resources
- Audit of theatre records
- Ad hoc questionnaire

Items of resource use in which there were statistically significant differences between the two groups were costed. Where no statistically significant difference was found, but there was assumed to be a significant effect on clinical practice and resource use, then such differences were costed and included in the evaluation.

Increases in resource use were then divided by the mean number of women delivering in the Midwives Unit to give a cost per woman. A cost per woman was calculated for each area of resource use; staff, consumables, equipment and overheads. These were then netted out to give a total cost per woman using the Midwives Unit.

Valuing resource use

Health service resources used by women in the two arms of the trial were valued at 1992-93 UK costs.

Sensitivity analysis

Where there was uncertainty about the cost, or amount, of variables used, sensitivity analysis was undertaken to assess the effect of various assumptions on the baseline difference in cost per woman.

2. RESULTS

Consumables

Statistically significant differences in the use of interventions included a higher use of fetal scalp electrodes, epidural anaesthesia, continuous fetal heart rate monitoring and episiotomy in the Labour Ward group. In the Midwives Unit group there was a higher incidence of intermittent fetal heart rate monitoring and an increased use of Transcutaneous Electrical Nerve Stimulation (TENS) for pain relief.

Differences which did not reach statistical significance but were costed included the increased use of assisted vaginal delivery, caesarean section and general anaesthesia in the Labour Ward group.

All these differences were then netted out. This gave a cost saving arising from the Midwives Unit of £3.25 per woman in terms of consumables used.

Staff costs

The main cost here was midwifery staff. A comparison of midwifery staffing levels before and after the opening of the Midwives Unit revealed an increase in number and grade of midwives. Manpower figures were used to take into account any increase in the number of deliveries. This left an increase of 3 midwives and 7 promotions which were due to the introduction of the Midwives Unit. The staff questionnaire within the clinical trial confirmed this finding. This resulted in an increased cost of £46.63 per woman.

In comparison, the cost savings in staff time involved in interventions were quite small (£1.94 per woman).

Thus, the overall staff cost of introducing the Midwives Unit was £44.69 per woman.

Capital costs

The total cost of converting the area for use as a midwives unit was £82,461. The equivalent annual cost was calculated using a length of life of 35 years. This gave a cost per woman of £3.82.

Next, differences in the number of units of equipment and furniture used within each area were calculated. These, with the value of the equipment, were used to calculate the cost per woman. The net result of equipment and furniture costs was a cost saving of £4.55 as a result of the introduction of the Midwives Unit.

Thus, the overall capital cost arising from the Midwives Unit was a saving of £0.73 per woman.

Overheads

Overheads were not costed because the length of labour was the same in both groups and the area would be used for deliveries regardless of whether it was a midwives unit or labour ward.

Baseline extra cost per woman

Table 1 summarises the cost per woman, within each area of resource use, of introducing the Midwives Unit. There was an increase in cost per woman in terms of staff costs but a decrease in terms of consumable and capital costs. This resulted in a net increase of £40.71 per woman as a result of the introduction of the Midwives Unit.

Table 1: Summary of costs.

Item	Extra cost per woman of MU care £
Staff costs	44.69
Consumable costs	(3.25)
Capital costs	(0.73)
Total cost per woman	40.71

Figures in parentheses represent cost savings in the Midwives Unit group relative to the Labour Ward group.

Sensitivity Analysis

Sensitivity analysis was conducted with the aim of making the results more generalisable.

Table 2 shows the total cost per woman for nine different scenarios and the areas of resource use which have been altered. The first scenario is the baseline cost per woman of introducing the Midwives unit from Table 1.

Scenarios 2 and 3 show the minimum and maximum baseline cost per woman respectively. In scenario 2 minimum values are taken for the uncertain Midwives Unit costs and maximum values for the uncertain Labour Ward costs to give the minimum total cost per woman of the Midwives Unit. In scenario 3 this is reversed, giving the maximum cost per woman. The variables about which there was uncertainty included: consumables and staff involved in a caesarean section; the amount of continuous fetal monitoring; the length of time taken to carry out an epidural; and the cost of the conversion. Scenario 4 assumes that only **statistically** significant differences are valued. Thus, differences in consumables and staff costs for **clinically** significant differences, such as caesarean section, are excluded.

In scenario 5, the assumption that the conversion costs were not due to the Midwives Unit, i.e. they would have occurred anyway, was tested. Next, the assumption that no staff promotions were necessary is tested. Scenario 6 shows the effect of employing a lower grade of midwife, E grade. This would mean that the increase in staff costs in midwifery salary terms was £30.93 per woman. Scenario 7 shows the effect of including both of the last two assumptions, that both lower grade midwives were employed and the conversion costs were not due to the Midwives Unit, on cost per woman. In scenario 8 the effect of **not** changing staffing levels is tested. Here it is assumed that neither an increase in grade nor number of staff was required for the Midwives Unit. Finally, the assumption was made that no change in staffing levels occurred and that the conversion costs were not due to the Midwives Unit. The results of this are shown in Scenario 9.

The sensitivity analysis demonstrates that the cost of introducing the Midwives Unit ranges from a cost saving of £9.74 per woman (scenario 9) to an additional cost of £44.23 per woman (scenario 4).

Table 2: Cost per woman of introducing the Midwives Unit for nine different scenarios.

	Scenario 1	Scenario 2	Scenario 3	Scenario 4	Scenario 5	Scenario 6	Scenario 7	Scenario 8	Scenario 9
Staff	+ 44.69	+ 44.53	+ 44.83	+ 46.18	+ 44.69	+ 28.99	+ 28.99	- 1.94	- 1.94
Consumables	- 3.25	- 3.63	- 3.02	- 1.22	- 3 .25	- 3.25	- 3.25	- 3.25	-3.25
Capital	- 0.73	- 0.87	- 0.53	- 0.73	- 4.55	- 0.73	- 4.55	- 0.73	- 4.55
Total	40.71	40.03	41.28	44.23	36.89	25.01	21.19	-5.92	- 9.74

3. CONCLUSION

The Midwives Unit offers a safe, effective alternative to consultant led care and has a lower rate of intervention. However, this is achieved at an increased cost. It should be remembered that this increased cost results from the Midwives Unit being added to an existing hospital facility. There are also other issues, such as choice, which should be considered. The 1992 report "Changing Childbirth" states that women have a right to choose where they would like their baby to be born. This study demonstrates that achieving greater effectiveness and choice may have a cost and that this cost can be substantial. The challenge for purchasers and providers is to judge which scenario best fits their local situation and in so doing decide whether any extra costs incurred are worthwhile.

This cost analysis was carried out in the Health Economics Research Unit. The trial on which it is based was carried out in the Department of Obstetrics and Gynaecology and is outlined in the companion paper (briefing paper 2). This briefing paper has been prepared by Vanora Hundley (Department of Obstetrics and Gynaecology) and Cam Donaldson (Health Economics Research Unit).

For further information contact:

Cam Donaldson
Deputy Director
Health Economics Research Unit
University Medical Buildings
Foresterhill,
Aberdeen, AB9 2ZD

Tel: 0224 681818 ext 53862
Fax: 0224 662994

OR

Vanora Hundley,
Research Sister,
Dugald Baird Centre,
Aberdeen Maternity Hospital,
Cornhill Road,
Aberdeen, AB9 2ZA

0224 681818 ext 53875

ABOUT HERU

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