Does monitoring newborn weight discourage breast feeding?

A McKie, D Young, P D Macdonald

Arch Dis Child 2006;91:44–46. doi: 10.1136/adc.2005.074484

See end of article for authors' affiliations

Correspondence to:
Dr P Macdonald,
Paediatric Offices,
Residence B, Southern
General Hospital,
Glasgow G51 4TF, UK;
peter.macdonald@sgh.
scot.nhs.uk

Accepted 11 October 2005
Published Online First
20 October 2005

Background: A policy of regular neonatal weight monitoring was introduced to a geographically defined population in 2000. This was combined with targeted breast feeding support for infants reaching specified intervention thresholds.

Aims: To look for evidence of compromise in breast feeding rates as a result of this policy change.

Methods: Breast feeding rates at 10 days and 6 weeks were compared for this intervention population and two local non-intervention groups for the years 1999 and 2001. The data were analysed using Poisson regression analysis and the Z-test.

Results: There was a 3.1% (95% CI 0.8% to 5.5%) rise in the deprivation corrected breast feeding rate at 6 weeks for the intervention population compared to an increase of 0.8% (95% CI –0.8% to 2.3%) for the combined control groups. Multivariate analysis showed that breast feeding rates were adversely influenced by deprivation, but were not significantly influenced by the intervention.

Conclusion: No evidence was found to support claims that regular monitoring of newborn weight adversely affects breast feeding rates.

Routine neonatal weight monitoring is controversial as demonstrating weight loss may discourage mothers from continuing to breast feed.¹ This issue was raised when we instituted such a policy to a geographically defined population following a fatal case of hypernatraemic dehydration.² We were unable to allay this anxiety, as we could find no reliable evidence base to either support or refute the claim. This paper reports the effect on our local breast feeding rates of introducing this policy.

METHODS

In February 2000 we introduced regular weight monitoring of all newborns to the geographically defined population followed up by our community midwife teams in conjunction with targeted breast feeding support.³ This support was refined in November 2000 as documented in table 1.

The local child health surveillance programme routinely collects data on feeding method. We analysed the 1999 and 2001 data on breast feeding rates at 10 days and 6 weeks, and compared the rates for infants from the postcode areas receiving such weight monitoring and support (intervention group) with those for the catchment areas serviced by the other two local maternity units (area A and area B). Neither of these units implemented a change in weighing policy over the time period studied. Hospital A infants were weighed prior to discharge and on day 3 (if in hospital at this time). Hospital B infants were weighed on day 3 or prior to discharge (whichever came first). After discharge neither group had any routine weight monitoring policy, and further weight measurements were only done at the discretion of the midwife. We were aware that area B represented a more deprived catchment. We expected this to influence baseline breast feeding rates and considered that deprivation differences might also lead to differing degrees of response to national and citywide efforts to promote breast feeding over time. To allow us to correct for this, the postcode areas were subdivided by DEPCAT category. This widely used method for assessing deprivation status has been validated for population studies and is assigned on the basis of the full residential

postcode—that is, at the level of a single street within a postcode district.⁴

Breast feeding rates were initially analysed using Poisson regression analysis. The model included factors representing hospital catchment (intervention, area A and area B), year of data collection (1999 or 2001), deprivation category (DEPCAT 1–7), and time of data observation (10 days or 6 weeks). Interaction terms for catchment × time and catchment × year were included to determine whether any fall off in breast feeding (between 10 days and 6 weeks) was intervention related and whether intervention influenced change in breast feeding rates over time. Statistical analysis was performed using MINITAB version 13 (www.minitab.com), with a significance level of 5%; adjustment for multiple comparisons was done using the Bonferroni method. The Z-test was used to compare the change in proportion breast feeding between the groups over time, assuming independent populations.

RESULTS

Glasgow is a city with high levels of deprivation. Our baseline population distribution was skewed towards more deprived DEPCAT groups, with area B having higher rates of

Table 1 Weighing policy and support to intervention group

Criteria	Action
All infants	Weigh day 2/3, day 5/6, and day 10
Infants who have not regained birth weight	Weigh day 14 and beyond
Breast fed: >10% weight loss	Refer to specialist breast feeding support sisters for supervised feeding, advice on positioning, and milk expression
Breast fed: < birth weight at 14 days	
Breast fed: >12.5% weight loss	Refer to paediatric medical staff for clinical assessment. Breast fed infants will have already been seen by breast feeding support sister
Breast fed: < birth weight at 21 days	
Formula fed: >10% weight loss

Figure 1 Baseline (1999) population distribution and 6 week breast feeding rates, by DEPCAT category.

social deprivation than the intervention group or area A (see fig 1).

Table 2 shows the DEPCAT adjusted breast feeding rates for the three groups. Breast feeding rates for the total population increased over the time period by 0.91%, though not quite to a significant degree ($p = 0.066$; 95% CI -0.06% to 1.89%). However, it is obvious from table 2 that this increase is largely due to the increase in the intervention group. The 95% confidence intervals for change in rate suggest that the intervention group experienced a real increase in the 6 week breast feeding rate over the time period. In comparison with the combined non-intervention areas, there was a 2.3% greater increase in breast feeding rates for the intervention group, both at 10 days (95% CI -0.7% to 5.3%) and 6 weeks (95% CI -0.5% to 5.1%).

Multivariate analysis showed a clear association between breast feeding rates and deprivation as measured by DEPCAT ($p < 0.001$); see fig 1 for baseline breast feeding rates. Area B had significantly poorer breast feeding rates (independent of deprivation status) when compared to either of the other groups ($p < 0.001$): intervention versus area B, OR 1.30 (95% CI 1.17 to 1.45), and area A versus area B, OR 1.26 (95% CI 1.14 to 1.40). The hospital $\times$ time interaction was not significant, providing no evidence that individual unit policy influenced the rate of fall off in breast feeding between 10 days and 6 weeks, either before or after the intervention.

Breast feeding rates for the intervention group increased more than the rates for the non-intervention groups. However, the hospital $\times$ year interaction was not significant whether compared to a similar baseline population (non-intervention, A), to a dissimilar population (non-intervention, B) or to both combined.

DISCUSSION

Recent reports highlight an increasing recognition of hypernatraemic dehydration and/or growth failure secondary to insufficient lactation or breast feeding difficulties. The assessment of satisfactory breast feeding is difficult and subjective; this creates uncertainty as to how to detect at risk infants. Some authors recommend regular weight monitoring to identify infants requiring more intensive support.⁵⁻⁸ Others argue that demonstrating weight loss or poor gain could discourage mothers from continuing to breast feed and advocate history and observation as more appropriate tools.¹ This may be an appropriate anxiety, but the evidence base is purely anecdotal and any beneficial effect (from reassuring and encouraging some mothers to continue breast feeding) may be invisible. A randomised controlled trial could provide the definitive answer to this, but is unlikely to be achievable due to practical obstacles. We introduced a policy of routine weight monitoring in this evidence-free environment and have now reviewed the consequences.

Deprivation status is clearly linked to breast feeding rates and we have corrected for this in our analysis. One of our comparator groups showed similar DEPCAT corrected breast feeding rates, but area B had significantly lower DEPCAT corrected breast feeding rates. We speculate that this could be related to poorer resourcing of breast feeding support locally, but this is difficult to quantify accurately. It is possible that knowing that a particular catchment has unusually high levels of deprivation (and secondary cultural preference for formula feeding) engenders a subconscious sense of futility regarding promotion of breast feeding. This could create a self-fulfilling expectation that not many will breast feed, explaining the difference between DEPCAT corrected breast feeding rates. Other influences within a unit may also influence breast feeding rates, as has been recently shown with regard to the impact of the Baby Friendly Initiative (BFI).⁹ The three hospitals achieved BFI accreditation at different times: area A, March 1999; intervention, December 2002; area B, December 2003. The slower implementation of BFI may be relevant to the lower baseline rates for area B. The difference in baseline breast feeding rates unexpectedly gave us the chance to compare our intervention to groups with both similar and dissimilar starting points. Neither comparison shows any adverse effect of routine weight monitoring.

The aims of our weight monitoring policy were to introduce a screening procedure that would act as a safety net for infants who might otherwise come to real physical harm due to feeding failure and to offer further breast feeding support to those mothers whose infants had poorer growth. The primary purpose of this study was to look for evidence of compromise in breast feeding rates as a result of this policy. We have found no evidence of such compromise, though there are potential confounding variables (including baseline

Table 2 DEPCAT adjusted breast feeding rates (%)

Group	1999 rates (n)	2001 rates (n)	Δ rate	Δ rate, 95% CI
10 days				
Intervention	37.6 (2911)	39.5 (3001)	+1.9	-0.6 to 4.4
Area A	38.0 (2263)	36.9 (2423)	-1.1	-3.8 to 1.7
Area B	30.4 (3277)	30.6 (3568)	+0.2	-2.0 to 2.4
A+B	33.5 (5540)	33.1 (5991)	-0.4	-2.1 to 1.4
6 weeks				
Intervention	25.1 (2836)	28.2 (2768)	+3.1	0.8 to 5.5
Area A	26.4 (2316)	26.6 (2277)	+0.2	-2.4 to 2.7
Area B	19.8 (3110)	21.1 (3206)	+1.3	-0.7 to 3.3
A+B	22.6 (5426)	23.4 (5483)	+0.8	-0.8 to 2.3

n = denominator population.

What is already known on this topic

- Routine neonatal weight monitoring has been proposed as a method of preventing neonatal hypernatraemic dehydration
- This is controversial due to concern that demonstrating weight loss may discourage mothers from continuing to breast feed, but there is no reliable evidence base to either support or refute this claim

breast feeding rates, time of acquisition of BFI status, background rate of change, and cultural issues within either hospital or community). We examined both 10 day and 6 week breast feeding rates, but consider the 6 week rates to provide a more valuable picture. All the study groups showed a small rise in the 6 week breast feeding rate over the study period, but the intervention group was the only group with a significant increase at this time. There was a 2.3% greater increase in the DEPCAT corrected rates for the intervention group compared to the combined controls. Although this was not significant, either on multivariate analysis or Z-test, the confidence intervals suggest that any real negative effect is likely to be very small, whereas any real positive effect could be very substantial. We have not seen any adverse effect on breast feeding rates and believe that any cases of mothers ceasing to breast feed are at least matched by those (who would otherwise have given up) being encouraged to continue.

We monitor the weight of all newborns irrespective of feeding method. We have clear intervention thresholds that (for breast fed infants) trigger targeted additional breast feeding support. Our results must be interpreted in context and cannot be applied to any system of routine weight monitoring without intervention thresholds and targeted support. The support available can strongly influence the maintenance of breast feeding following hospital discharge.¹⁰ It is certainly plausible that uninformed weight monitoring without any targeted support could have detrimental effects, both on individuals and on population breast feeding rates. However, our data suggest that monitoring newborn weight within an informed and supportive environment will not discourage breast feeding.

What this study adds

- A detailed observational study noted a rise in breast feeding rates at 6 weeks following the introduction of a policy of routine neonatal weight monitoring. Comparator control groups showed no significant rise in breast feeding rate
- The data suggest that monitoring newborn weight with targeted breast feeding support does not discourage breast feeding

ACKNOWLEDGEMENTS

This study was made possible by the work of the Scottish Health Department Information & Statistics Division who collate national data, and locally by Mary Broadfoot and the Glasgow Breastfeeding Implementation Strategy Group who provided the raw data.

Authors' affiliations

A McKie, P D MacDonald, Neonatal Paediatric Dept, Southern General Hospital, Glasgow, UK

D Young, Research and Development Department, Royal Hospital for Sick Children, Glasgow, UK

Competing interests: none

REFERENCES

- 1 **Williams AF**. Weighing breast-fed babies. *Arch Dis Child Fetal Neonatal Ed* 2002;**86**:F69.
- 2 **Macdonald PD**, Grant L, Ross SRM. Hypernatraemia in the first few days: a tragic case. *Arch Dis Child Fetal Neonatal Ed* 2003;**88**:F350.
- 3 **Macdonald PD**, Ross SRM, Grant L, et al. Neonatal weight loss in breast and formula fed infants. *Arch Dis Child Fetal Neonatal Ed* 2003;**88**:F472–6.
- 4 **Carstairs V**, Morris R. Deprivation: explaining differences in mortality between Scotland and England and Wales. *BMJ* 1989;**299**:886–9.
- 5 **Laing IA**, Wong CM. Hypernatraemia in the first few days: is the incidence rising? *Arch Dis Child Fetal Neonatal Ed* 2002;**87**:F158–62.
- 6 **Harding D**, Moxham J, Cairns P. Weighing alone will not prevent hypernatraemic dehydration. *Arch Dis Child Fetal Neonatal Ed* 2003;**88**:F349–50.
- 7 **Oddie S**, Richmond S, Coulthard M. Hypernatraemic dehydration and breast feeding: a population study. *Arch Dis Child* 2001;**85**:318–20.
- 8 **Moritz ML**, Manole MD, Bogen DL, et al. Breastfeeding-associated hypernatremia: are we missing the diagnosis? *Pediatrics* 2005;**116**:e343–7.
- 9 **Broadfoot M**, Britten J, Tappin DM, et al. The baby friendly hospital initiative and breastfeeding rates in Scotland. *Arch Dis Child Fetal Neonatal Ed* 2005;**90**:F114–16.
- 10 **Coutinho S**, de Lira P, de Carvalho Lima M, et al. Comparison of the effect of two systems for the promotion of exclusive breastfeeding. *Lancet* 2005;**366**:1094–100.