BJOG: an International Journal of Obstetrics and Gynaecology
July 2005, Vol. 112, pp. 927–934
DOI: 10.1111/j.1471-0528.2005.00548.x

The impact of intrapartum analgesia on infant feeding

Sue Jordan,[a] Simon Emery,[b] Ceri Bradshaw,[a] Alan Watkins[c] Wendy Friswell[b]

Objective To investigate the impact of intrapartum analgesia on infant feeding at hospital discharge.

Design Retrospective cohort.

Setting Maternity unit of a UK district general hospital.

Population A random sample of 425 healthy primiparae delivering healthy singleton babies at term in 2000.

Methods A random sample of primiparae delivering term neonates was identified from the birth register. We retrieved and analysed the corresponding joint midwifery/obstetric case notes.

Main outcome measure Infant feeding method at discharge from hospital.

Results Women [190/424 (45%)] were exclusively bottle feeding their babies at discharge from hospital. No one commenced breastfeeding after hospital discharge. Regression analysis revealed that the main determinants of bottle feeding were as follows: maternal age [odds ratio (OR) 0.90, 95% confidence interval [CI] 0.85–0.95 per year]; occupation (OR 0.63, 95% CI 0.40–0.99 for each category, unemployed, manual, non-manual); antenatal feeding intentions (OR 0.12, 95% CI 0.080–0.19 for each category, bottle feeding, undecided, breastfeeding); caesarean section (OR 0.25, 95% CI 0.13–0.47, caesarean or vaginal delivery); and dose of fentanyl administered intrapartum (OR 1.004, 95% CI 1.000–1.008, 90% CI 1.001–1.007 for each microgram administered, range 8–500 μg).

Conclusions A dose–response relationship between fentanyl and artificial feeding has not been reported elsewhere. When well-established determinants of infant feeding are accounted for, intrapartum fentanyl may impede establishment of breastfeeding, particularly at higher doses.

INTRODUCTION

The benefits of breastfeeding to both infants and mothers are established. However, the Department of Health Infant Feeding Survey, 2000, indicated that only 69% ($n = 9492$) of women giving birth in the UK attempted to breastfeed, and 39% were exclusively bottle feeding on discharge from hospital.[1] Targets have been set to increase the proportion of women breastfeeding by 2% per year.[2] To date, public health and psychosocial interventions have not substantially increased the proportion of women breastfeeding.[2,3]

Most labouring women require analgesia. However, the strategies for intrapartum analgesia are changing. Between 1989–1990 and 2001–2002, the proportion of women receiving neuraxial analgesia increased from 16% to 33%. Simultaneously, the use of general anaesthetics and reliance on inhalation and/or intramuscular analgesia declined.[4] However, the impact of these changes on infant feeding has not been explored.

Systematic review indicates that intrapartum analgesics have varying effects on the components of neurobehavioural scales used to assess neonatal behaviour, but only one study reports a dose–response effect.[5] There are no reports of administration of fentanyl or morphine to breastfeeding mothers resulting in clinical effects on neonates.[6] However, intrapartum administration of intramuscular opioids may be linked to lower incidence of breastfeeding.[1,7]

Comparisons between intrapartum epidural analgesia containing only local anaesthetics and systemic opioids indicate similarities in infant behaviour and breastfeeding success.[8–10] However, infants exposed to intrapartum epidural analgesia may be less responsive than unmedicated controls[5]: a case note review ($n = 138$) reports a reduction in breastfeeding at six months postpartum with administration of any epidural anaesthesia.[11] Studies on the impact of maternal epidural fentanyl administration on neonatal behaviour report conflicting findings.[8,12–15]

'Non-experimental (observational) epidemiological studies provide the best source of quantitative information on adverse drug reactions'.[16–18] Not all adverse drug reactions are predicted, or even predictable, from premarketing research. The uncertainties surrounding the effects of drugs on the fetus and neonate, together with the associated ethical considerations and recruitment difficulties, make prospective experimental testing of drugs in pregnancy and lactation difficult. Systematic reviewers of adverse drug reaction studies prioritise retrospective analyses of hospital medical records over other research methods, as these

[a]*School of Health Science, University of Wales, Swansea, UK*
[b]*Singleton Hospital, Swansea, UK*
[c]*European Business Management School, University of Wales, Swansea, UK*

Correspondence: Dr S. Jordan, School of Health Sciences, University of Wales, Swansea, Singleton Park, Swansea SA2 8PP, UK.

Table 1. Variables analysed and included in the regression model.

Categorical variables	*n*	*n* (%)			
Drugs administered					
Antiemetics	425	262 (54.6)			
Oxytocin before delivery	424	157 (37.0)			
Any neuraxial analgesic	425	232 (54.5)			
Any non-inhalational analgesic in labour	425	356 (83.8)			
Diamorphine	425	36 (8.5)			
Caesarean section	425	100 (23.5)			
Mother's occupation	419				
Unemployed		34 (8.0)			
Manual		191 (44.9)			
Non-manual		194 (45.6)			
Feeding intention	425				
Bottle		78 (18.4)			
No decision		164 (38.6)			
Breast		183 (43.1)			
Interval variables	*n*	Mean	Median	Min–Max	SD
Mother's age (years)	425	25.54	25	18–46	5.34
Length of labour (hours)	421	8.98	9.0	0–35	5.5
Hospital stay (days)	425	3.79	3.0	1–24	2.5
Fentanyl dose (μg)	104	129.3	114	8–500	81.7
Pethidine doses (number)	216	1.28	1	1–4	0.53

Length of labour is taken as 0 for delivery by elective caesarean section ($n = 28$) or if delivery by caesarean section occurred before cervical dilatation reached 5 cm ($n = 5$).

studies have larger numbers and detect higher rates of adverse drug reactions.[19]

The possibility that intrapartum analgesia is affecting breastfeeding has not been investigated in adequately powered prospective studies. Infant feeding is rarely included in the outcome variables of obstetric reviews; therefore, no data sets are available for comparison and sample size calculation. We explored the contribution of intrapartum medication to other variables known to affect breastfeeding by a detailed retrospective case note review of a cohort of 425 primiparae delivering singleton neonates at term.

METHODS

This study was undertaken in a UK district general hospital with regional tertiary care facilities. The sample for this study was selected to minimise known confounding variables. Because past experience of infant feeding influences breastfeeding,[1] we included only primiparae. Women who were prescribed medicine for ongoing conditions, those admitted to high dependency facilities and those delivering seriously ill or preterm (less than 37 weeks of gestation) infants were excluded, as these factors are likely to indicate suboptimal health and affect feeding method. Home births and twins were also excluded. For ethical reasons, parturients aged under 18 were excluded, as they had not attained full adult status. In 2000, 3225 births took place in this hospital, 1487 (46%) to primiparae. Hospital numbers of 1141 primiparae aged 18 or over delivering infants of at least 37 weeks of gestation, but not transferred to high dependency facilities, were identified from the birth register for the year 2000. For each month, a random sample of 40 of these was selected using SPSS. The corresponding joint obstetric/midwifery notes were retrieved from the medical records' department. These notes described antenatal, intrapartum and up to 28 days postpartum care. In all, after meeting the exclusion criteria, we reviewed case notes for 425 healthy primiparae delivering healthy term singleton babies in the study hospital from 1 January 2000 to 31 December 2000. Data were extracted from case notes, entered into SPSS version 11 and routinely checked in 10% of cases. The data set was checked for outlying values and incongruent data entry by two investigators.

Feeding on discharge from hospital was the primary outcome variable, in line with the WHO/UNICEF Baby Friendly Hospital Initiative[20,21] and other authors.[22] Comparative data for this variable are available in the Department of Health Infant Feeding Survey for 2000.[1] Information on feeding at hospital discharge was available in the hospital discharge summary for 424 women. Women were classified as 'bottle feeding' only if they were bottle feeding exclusively. Women who were breastfeeding but administering some artificial supplements were classified as breastfeeding, in line with Department of Health (DoH) surveys.[1] Such partial breastfeeding confers some protection against respiratory illness[23] and allergic disease,[24] but the benefit is less than that obtained with exclusive breastfeeding.

The local research ethics committee approved the study. No patient identifiers such as names, addresses or postcodes were recorded.

Data were explored with univariate and bivariate techniques, *t* tests and the χ^2 test, with Yates' continuity correction for 2×2 tables, as appropriate.[25] To accommodate the known confounding variables, data were analysed using logistic regression, with explanatory variables selected using a backwards likelihood ratio criterion. The 13 variables included in the regression analysis were derived from the literature and selected from bivariate analyses on the basis of their statistical significance ($P < 0.05$) and preliminary regression analyses. These include a range of drugs and other variables likely to influence infant feeding (Table 1).

RESULTS

The women's age, occupation, antenatal feeding intention, duration of labour and hospital stay are described in Table 1. The mean gestation was 39.6 weeks (SD 1.2, range 37–42 weeks). The mean weight of babies was 3.4 kg (SD 0.46, range 1.68–4.82 kg.). Just over 60% of the sample

Table 2. Intrapartum analgesia administered ($n = 425$).

Analgesia		No. of women	Percentage of sample
None		6	1.4
Nitrous oxide	Total	354	83
with oxygen	Alone	63	15
Intramuscular opioid[1]	Total	216	51
	Without neuraxial analgesia	124	29
Neuraxial analgesia	Total	232	55
	Containing only local anaesthetic	74	17
	Containing opioid	158	37
General anaesthetic	Total	10	2.4

[1] All but eight women received intramuscular pethidine.

(258/425) had normal vertex deliveries, nearly 16% (67/425) had assisted deliveries and nearly 24% (100/425) had emergency (72) or elective (28) caesarean sections. The mean postnatal stay was 2.5 days (SD 1.7, range 1–11 days).

The analgesia administered is detailed in Table 2. Sufentanil, alfentanil and remifentanil were not encountered.

Our data, which included only healthy neonates, gave no indication of any links between parenteral or neuraxial opioids and respiratory depression. No baby required naloxone. The three babies with low Apgar scores at both 1 and 5 minutes were delivered under general anaesthetic, one in association with epidural morphine.

Choice of analgesia was related to mode of delivery. Neuraxial morphine ($n = 47$) and diamorphine ($n = 36$) were used almost exclusively for caesarean section. Only neuraxial fentanyl was employed in more than one method of delivery (Table 3).

No one commenced breastfeeding after hospital discharge. One hundred and ninety out of 424 (45%) women were exclusively bottle feeding at discharge from hospital. Forty-three of these women (10% of sample) had attempted breastfeeding. For 147/424 (34.6%) women, no attempt at breastfeeding was recorded at any time. At hospital discharge, 225/424 (55%) were successfully breastfeeding, either fully or partially.

The proportion of women bottle feeding varied with intrapartum analgesia administered: 22/69 (32%) women whose only analgesia was nitrous oxide with oxygen, bottle fed; 52/124 (42%) women who received only intramuscular opioids plus nitrous oxide with oxygen, bottle fed; 32/73 (44%) women who received neuraxial analgesia containing only local anaesthetic, bottle fed; and 84/157 (54%) women who received neuraxial analgesia containing an opioid, bottle fed. This trend was accentuated for lipophilic opioids: fentanyl 55/101 (55%) bottle fed; diamorphine 23/36 (64%) bottle fed (Fig. 1).

Bivariate analyses indicated associations between bottle feeding and administration of any analgesia [$\chi^2 = 4.96$, $df = 1$, $P = 0.026$, 95% confidence interval (CI) = 1.11–3.32]; administration of any neuraxial analgesia ($\chi^2 = 5.53$, $df = 1$, $P = 0.019$, CI = 1.10–2.39); administration of any neuraxial opioid ($\chi^2 = 6.90$, $df = 1$, $P = 0.009$, CI = 1.17–2.59); administration of a lipophilic opioid (diamorphine or fentanyl) ($\chi^2 = 5.90$, $df = 1$, $P = 0.015$, CI = 1.13–2.66); administration of neuraxial diamorphine ($\chi^2 = 4.98$, $df = 1$, $P = 0.026$, CI = 1.15–4.76); administration of neuraxial fentanyl ($\chi^2 = 4.39$, $df = 1$, $P = 0.036$, CI = 1.06–2.60). Three women received intravenous fentanyl. None of these breastfed successfully. When these women were included in the analysis, the association between fentanyl and artificial feeding strengthened ($\chi^2 = 6.00$, $df = 1$, $P = 0.014$, CI = 1.14–2.79). The only analgesic whose dose was related to infant feeding was fentanyl ($t = 2.15$, $df = 353$, $P = 0.032$, CI = 1.25–28.25).

Intrapartum antiemetics were associated with bottle feeding ($\chi^2 = 4.27$, $df = 1$, $P = 0.039$, CI = 1.04–2.26) and also with caesarean section ($\chi^2 = 53.72$, $df = 1$, $P < 0.001$, CI = 4.46–15.48). The only other factors associated with bottle feeding were caesarean section ($\chi^2 = 4.97$, $df = 1$, $P = 0.026$, CI = 1.09–2.69); feeding intention recorded in the antenatal notes ($\chi^2 = 143.6$, $df = 2$, $P < 0.001$); maternal age ($t = 6.05$, $df = 422$, CI = 2.05–4.02, $P < 0.001$); and maternal occupation ($\chi^2 = 33.82$, $df = 2$, $P < 0.001$). Maternal age and occupation were also significantly associated (ANOVA, $F = 49.00$, $df = 2, 416$, $P < 0.001$). There were no statistically significant associations between infant feeding and antenatal oxytocin, length of hospital

Table 3. Variation in use of analgesic with method of delivery.

	Normal vaginal delivery	Forceps or ventouse	Elective caesarean section	Emergency caesarean section	Total
Intravenous fentanyl	0	1	0	2	3
Epidural fentanyl	42	23	3	33	101
Epidural morphine	0	1	24	23	48
Epidural diamorphine	0	0	1	35	36
Epidural with local anaesthetic only	51	22	1	0	74
General anaesthetic	1 (administered after delivery)	0	2	7 (in five of the seven cases, the only other analgesic was intramuscular opioids)	10

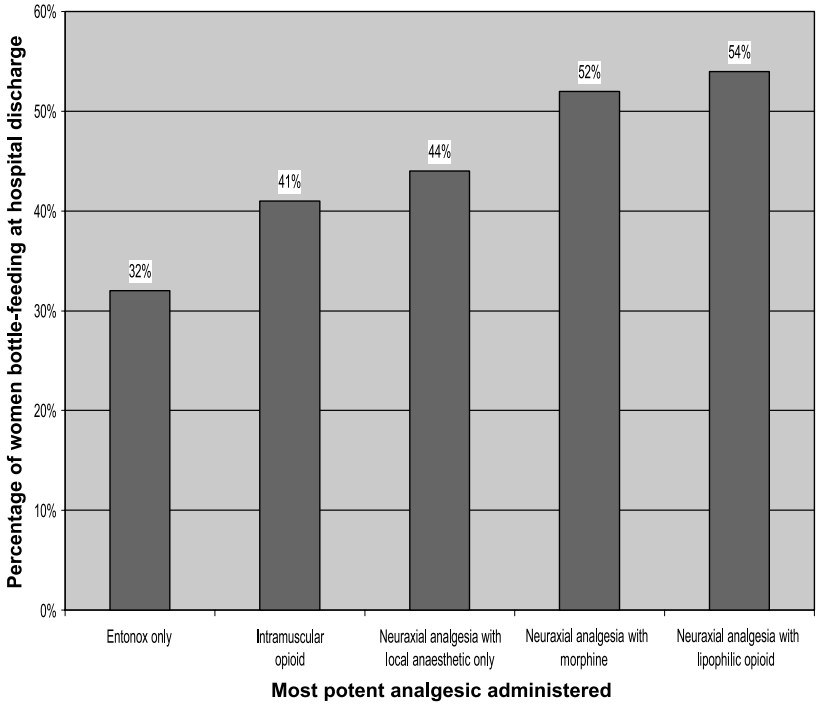

Fig. 1. Intrapartum analgesia and bottle feeding.

stay, duration of labour, maternal weight or baby's stay in special care ($n = 14$). Neither pethidine administration, total dose nor numbers of doses were related to infant feeding in bivariate analyses. Logistic regression indicated that the number of doses of pethidine was a more important predictor of infant feeding than other variables relating to intramuscular opioids.

Because of missing data in some variables (Table 1), mainly on maternal occupation, 413 cases were available for regression analysis. In the final logistic regression model, feeding at hospital discharge was predicted by maternal age (between 18 and 46), antenatal feeding intention, caesarean section, fentanyl dose (between 8 and 500 μg) and maternal occupation (Table 4). This model predicts 51.7% of the variation in infant feeding (residual variance and R^2: Nagelkerke 0.517). Artificial feeding is predicted for 75.3% of cases and breastfeeding for 83.3% of cases, with an overall percentage of 79.7%.

Neuraxial opioids were associated with caesarean section; however, our regression model suggests a dose–response relationship between fentanyl and bottle feeding, independent of all other factors. Our model predicts that the impact of fentanyl will vary according to other determinants of infant feeding. For women with manual occupations, aged 25, planning to breastfeed and delivering vaginally, the probability of bottle feeding rises by 56%, from 11.4% to 17.7%, if the mean dose (129 μg) of fentanyl is administered; however, if delivery is by caesarean section, the probability of exclusive bottle feeding rises by 36%, from 34.2% to 46.5%. Most women who planned to bottle feed did so (75/78, 96.2%), and fentanyl had little impact. In contrast, for women least likely to bottle feed, administration of 129 μg fentanyl had a marked effect; for example, for a woman aged 32, in a non-manual occupation, planning to breastfeed and delivering vaginally, fentanyl increased the probability of bottle feeding by 63%, from 3.7% to 6.1%.

Table 4. Coefficients in the final logistic regression model and OR (with 95% CI) for risk of exclusive bottle feeding at hospital discharge.

Variable	Coefficient	OR	95% CI	*P*
Caesarean section (0 = caesarean, 1 = natural)	−1.39	0.25	0.13–0.47	<0.001
Mother's occupation (0 = unemployed, 1 = manual, 2 = non-manual)	−0.465	0.63	0.40–0.99	0.045
Feeding intention (0 = bottle, 1 = undecided, 2 = breast)	−2.09	0.12	0.079–0.19	<0.001
Mother's age (years)	−0.11	0.90	0.85–0.95	<0.001
Fentanyl dose (μg)	0.004	1.004	1.000–1.008	0.035
Constant	6.747			

The variables adjusted for in this regression model are listed in Table 1. The 90% CI for the OR for fentanyl is (1.001–1.007), Hosmer and Lemeshow test $P = 0.27$.

DISCUSSION

This is the first report of a dose–response relationship between intrapartum neuraxial opioid analgesia and infant feeding. When well-established determinants of infant feeding are accounted for, intrapartum fentanyl may impede breastfeeding, particularly at higher doses.

Retrospective observational case note data reflect the 'real world' and are free of recruitment, recall or volunteer biases and loss to follow up[26]; however, they are limited by unknown or unrecognised biases and extraneous confounding variables. Nevertheless, there are few alternative viable options for investigating previously unsuspected adverse drug reactions after a drug has been adopted in practice.[16] Therefore, retrospective case review is the preferred research strategy for detection of evidence of harm, including adverse drug reactions.[16–19,27]

Decisions on infant feeding are complex and depend on many factors, not all of which are fully understood. All known confounding variables were accommodated in the regression model. However, women receiving neuraxial analgesia may be different in other ways or other factors may be influencing infant feeding behaviour. As in other work in this field, we did not explore the impact of any individual midwives or obstetricians on infant feeding practices. The influence of family and friends[28] could not be reliably identified from case notes, but is likely to be linked to maternal occupation and age.

The less commonly administered neuraxial opioids, morphine and diamorphine, were administered almost exclusively in association with caesarean section to relatively small numbers of women (Table 3). Therefore, these did not appear as independent predictors in the final regression model.

There can be no guarantee that our findings can be transferred outside the dose ranges described or to women with ongoing medical conditions or admitted to intensive care facilities or to other settings; however, the pattern of analgesia use described here is typical of hospitals throughout the UK. The higher usage of neuraxial analgesia than in national statistics[4] is accounted for by the fact that our women were primiparae.

Identifying an event as causally drug related is a highly contingent social process, involving complex clinical and academic judgements.[29] Despite detailed algorithmic approaches to adverse drug reaction identification, causal relationships between medication and adverse events cannot always be formally tested by experimental research and may retain an element of subjectivity and interpretavism.[30] In this context, the dose–response criterion assumes greater importance.[31]

With all observational research, care must be taken when attributing causality.[25] We cannot discount the possibility that women receiving neuraxial opioids were in more pain or were less tolerant of pain and discomfort and sought 'stronger' analgesia: such women may be less inclined to breastfeed. However, we found no links between hospital stay, length of labour or antenatal oxytocin and bottle feeding. If duration of labour and antenatal oxytocin are associated with more difficult labour, the absence of association with bottle feeding, together with the other factors, would tend to refute any link between 'difficult' labour and bottle feeding. However, further work is needed before these associations can be discounted.

'Failure to breastfeed' is an elusive adverse drug reaction. Because 'failure to breastfeed' is not recognised as a possible harmful effect of medication, there are few methodological precedents in this area. The complex, but underresearched, physiological process of establishing lactation is not generally considered vulnerable to pharmacological influences. The transitory nature and 'ordinariness' of 'switching to bottle feeding' render the usual algorithms for identifying adverse drug reactions inadequate, inapplicable or even irrelevant. Susceptibility to bottle feeding is often regarded as determined exclusively by socio-cultural factors. The possibility of an additional dose-related impact of medication has not previously been explored in this context.[19,32]

Our findings concur with work linking infant feeding practices to maternal age and occupation,[1] antenatal feeding intentions[33] and caesarean section.[7,34] However, some authors report no association between caesarean section and bottle feeding.[1,35]

As in other studies, women receiving only nitrous oxide analgesia were more likely to breastfeed than mothers administered bupivacaine epidurals[10] or intramuscular opioids,[7] but this difference was statistically insignificant. With the difference in proportions found in our study (68% *vs* 56%), we would need 734 women randomised to inhalational analgesia or intramuscular opioids to detect a significant difference in breastfeeding between these two methods of analgesia. Our midwives may have been aware of the potential impact of pethidine on breastfeeding and deliberately administered lower and fewer doses to those intending to breastfeed, as this is emphasised in their education programme.[36] The low doses and the low number of doses observed in our study may also explain any discrepancies between our findings and those of others[1,7] because pethidine tends to accumulate in the neonate as more doses are administered.[37]

The doses of fentanyl administered in our study (mean 129 [SD 82] μg) were rather lower than those in the study of Porter *et al.*[38] (183 [75] μg, $n = 114$) and likewise were insufficient to depress respiration. However, doses 150–600 μg ($n = 38$) were associated with one case of respiratory depression in an older study.[15] Neonatal anaesthetic research indicates that spontaneous respiration may fail if neonatal plasma fentanyl concentration rises above 0.05–0.77 ng/mL and sensitivity of the neonatal respiratory centre shows considerable inter-individual variation.[39] It is possible that in some babies in our study and others',[38] the plasma fentanyl concentration reached the lower end of the range where respiratory depression can occur, but no babies

were susceptible to respiratory depression. However, when present at concentrations below that needed to induce respiratory depression, opioids may exert other, more subtle, effects on the central nervous system, including neurobehavioural effects.[9] Without optimal muscle tone and reflexes, the neonate is unlikely to suckle correctly, causing trauma, soreness and pain, which will deter all but the most determined women.

Pharmacokinetic studies suggest that, following neuraxial administration to the woman, sufficient fentanyl may enter the neonate to affect behaviour. All opioids pass into the neonate via both the placenta and the colostrum, but transfer is more rapid and complete for the more lipophilic compounds, such as diamorphine and fentanyl. The concentration of fentanyl in maternal plasma and its subsequent transfer into the umbilical vein increases (0.03–0.38 ng/mL, $n = 40$), as the epidural dose administered increases between 25 and 275 μg.[12] Similarly, Porter *et al.* reported the umbilical vein concentration of fentanyl to be 0.077 [0.061] ng/mL ($n = 48$) following maternal epidural doses of 183 [75] mg.[38]

Fentanyl is sequestered into both the colostrum[40] and the fetus[13,14,41] and is released from binding proteins (albumins) in the first few hours of neonatal life.[16] The fetus has a higher concentration of free or unbound opioids than the mother, and this increases if the fetus becomes acidotic. The concentration of free fentanyl increases by 4% as pH falls from 7.4 (in mother) to 7.2 (in fetus).[42] In babies requiring emergency caesarean section, fetal pH may be even lower, which could increase the concentration—and effect—of unbound fentanyl.

Elimination half-lives of opioids are longer in neonates than adults: the plasma half-life of fentanyl is 3.7 [0.4] hours in adults[43] and 5.29 [4.4] hours in healthy term neonates.[42] The elimination of fentanyl in neonates and adults is not always uniform but may involve transient rebounds, which prolong the depressant effects.[39] This delayed clearance allows accumulation in the central nervous system, which could be sufficient to produce subtle behavioural changes,[40,41] such as depression of feeding reflexes.

The literature contains contradictory reports of the impact of neuraxial opioids on lactation and neonatal behaviour. Our findings are congruent with a randomised prospective study, where infants whose mothers received epidural fentanyl (80–265 μg) had lower neurobehavioural scores than those whose mothers received only bupivacaine ($P = 0.02$), whereas administration of sufentanil had no impact on neonatal behaviour scores ($n = 36$).[14] Together with the pharmacokinetic data,[12–14,16,38–42] this would indicate that neuraxial opioids administered during labour could be depressing the fine tuning and co-ordination of neonatal suckling reflexes. However, a concurrent effect on lactation cannot be discounted: In a randomised controlled trial of infant feeding ($n = 20$), mothers receiving epidural buprenorphine had less pain but lower volumes of breast milk and their infants gained less weight than those receiving bupivacaine alone (no P values quoted).[44]

In contrast, observational studies detected no abnormalities in either neonatal behaviour or Apgar scores following administration of fentanyl, up to 275 μg ($n = 40$)[12] and up to 300 μg ($n = 21$).[13] The other prospective study[8] with infant feeding as an end point found no associations between either intramuscular opioids or epidural analgesia, with or without opioids, and infant feeding at six weeks. The odds ratio (OR) for bottle feeding was higher for neuraxial fentanyl than for other analgesics, but this did not reach statistical significance (OR = 1.88, 95% CI = 0.62–5.71, $P = 0.27$). Comparisons with this Canadian study are complicated by the very different feeding practices: six weeks postpartum, 93% of the women were breastfeeding, 72% exclusively, whereas only 43% of women are even partially breastfeeding in the UK at six weeks postdelivery.[1] A retrospective comparison of infant suckling indicated that although epidural fentanyl, with or without epidural bupivacaine, had no effect, intravenous fentanyl depressed neonatal suckling behaviour ($P < 0.01$, $n = 116$).[45] Our data are congruent with the reported adverse impact of intravenous fentanyl on infant feeding.

Our data indicate that any impact of intrapartum analgesia on infant feeding is unlikely to be uniform throughout the population studied: where women had intended to bottle feed, intrapartum analgesia made no difference; where women had undergone a caesarean section, this was a more powerful determinant of infant feeding than the type of analgesia. However, where other factors favoured breastfeeding, intrapartum fentanyl appeared to thwart the mothers' intentions. It has been suggested that extra help is offered to establish breastfeeding to women who have undergone a caesarean section.[46] In the absence of further data and contrary evidence, we should like to propose that similar support is offered to women who have received neuraxial lipophilic opioids during labour, while they are in hospital, regardless of mode of delivery and length of labour.

CONCLUSIONS

While inhalation analgesia is rapidly eliminated from both mother and neonate, other analgesics cross the placenta and enter colostrum. Therefore, intrapartum analgesics may exert subtle effects on both infant and mother, hindering initiation of breastfeeding.

Currently, there is no evidence that neuraxial opioids do not impact on infant feeding, and some suggestions that they do. This work is exploratory, and further studies are needed to confirm or refute our findings. However, our findings are potentially important for obstetricians, anaesthetists, midwives, neonates and new mothers. The proportion of labouring women administered neuraxial opioids is increasing, with up to 50% of parturients receiving neuraxial opioids in some centres.[47] Based on our findings

alone, replacing regimens including fentanyl with neuraxial analgesia containing only local anaesthetics would increase breastfeeding at hospital discharge in excess of current policy targets.[2]

Acknowledgments

The authors would like to thank Mahesh Perera, Specialist Registrar, Obstetrics and Gynaecology, University Hospital of Wales, Cardiff, and Joy Payne, Head of Midwifery, Singleton Hospital, for advice in early stages of the project; and Lorna Keyes, Medical Secretary, and Lyn Jones, Medical Records Officer, for administrative support.

Source of funding

This study was funded by the Wales Office of Research and Development for Health and Social Care. Further funding is being sought to continue and develop this work. The funding source had no role in the study design, data collection, analysis, interpretation, report writing and decision to publish.

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Accepted 19 October 2004