The effect of intrapartum pethidine on breastfeeding: a scoping review

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Abstract

Background. The Lancet series on breastfeeding announced that the UK has the lowest breastfeeding rate in the world. The influence of intrapartum pethidine on breastfeeding has been debated over many years, including studies suggesting that pethidine is detrimental to breastfeeding. Yet, in some NHS trusts, 66% of labouring women use pethidine.

Aim. The aim of this paper is to inform midwifery practice by reviewing the impact of pethidine on breastfeeding through identifying and reviewing published research studies that help to address the following question: What is known from the existing literature about the effect of intrapartum pethidine on breastfeeding?

Method. Searches of three electronic databases and references cited by retrieved studies were used to identify all relevant studies published prior to January 2016. A combination of the following MeSH terms and key words were used: parturition, infant, meperidine, breastfeeding, pethidine (and all of the alternative terms given to pethidine), sucking behaviour, rooting and alertness. Using inclusion and exclusion criteria, 347 studies were screened by title and abstract. As this is a scoping study, all types of research methods were included. A total of 24 research studies were identified as fulfilling the aim.

Results. The results indicate that intrapartum pethidine has a detrimental effect on sucking, breastfeeding duration and neonatal behaviour related to breastfeeding.

Implications. Healthcare practitioners should seriously contemplate whether the adverse effects of pethidine on breastfeeding should prevent its use as intrapartum analgesia.

Key words: Parturition, infant, meperidine, pethidine, breastfeeding, sucking, neonate, intrapartum, evidence-based midwifery

Introduction

The Lancet’s recent series revealed that the UK, along with Saudi Arabia, has the poorest breastfeeding rate in the world, with <1% of women breastfeeding at 12 months (Cesar et al, 2016). The series suggests that delay in initiation of breastfeeding and a shortened duration of breastfeeding is influenced by many factors, including historical, socioeconomic, cultural, and individual factors (Rollins et al, 2016). However, the series does not discuss the effect of intrapartum drugs on breastfeeding. The aim of this paper is to inform midwifery practice by reviewing the impact of pethidine on breastfeeding behaviour.

Opioids are widely used for intrapartum analgesia with pethidine being the most commonly used opioid worldwide (Ullman et al, 2010). A fifth of UK women use pethidine or a similar drug for intrapartum analgesia, though the extent of pethidine use ranges from 5% to 66% between NHS hospital trusts (Care Quality Commission, 2013; Healthcare Commission, 2007). Although national guidelines and Cochrane reviews suggest that women should feel free to choose from a range of analgesia (NICE, 2014; Jones et al, 2012), there has never been a conclusive decision regarding the safety of pethidine for women and neonates.

A preliminary search of the published studies revealed that there was considerable variation in methods, outcomes and quality between the studies. Although this preliminary search did uncover randomised controlled trials (RCTs), the findings could not be pooled due to the disparity in their methods and reporting of outcomes; thus a systematic review was not viable. Nevertheless a scoping review is able to identify and analyse studies with the same rigour as a systematic review, but is also able to provide a qualitative synthesis of findings from different types of research methods, providing the best available evidence that can be used to identify gaps in research and influence policies and practice. This review used a systematic approach to locate and select all studies that answered the question: What is known from the existing literature about the effect of intrapartum pethidine on breastfeeding?

Method

Three electronic databases were searched in January 2012 to identify relevant studies; MEDLINE (1964 to March 2012), EMBASE (1974 to week 11, 2012) and MIDIRS using MeSH terms and key words: parturition, infant, meperidine, breastfeeding, pethidine, alternative terms for pethidine, sucking behaviour, rooting and alertness. A subsequent search was conducted in January 2016. Flowchart 1, overleaf, shows the selection process. The inclusion criteria were:

- Study type: primary research that reported a relationship between intrapartum pethidine and breastfeeding outcomes
- Population: neonates whose mothers received pethidine during labour
- Intervention type: pethidine for women in labour
- Outcome: the effect of pethidine on breastfeeding
- English language

The studies were classified as ‘strong’, ‘moderate’ or ‘weak’, according to the quality criteria for studies outlined by the Centre for Reviews and Dissemination (2009).
Results
The findings from the research studies are categorised into five outcome groups:
- Sucking behaviour
- Age at first suck
- Neonatal behaviour related to breastfeeding
- Initiation and duration of breastfeeding
- Pethidine alone or multiple interventions.

The first three outcome groups were devised with reference to the Infant Breastfeeding Assessment Tool (IBFAT), which was developed to assess neonates’ breastfeeding competence (Matthews, 1988). This review’s concluding outcome explores the studies to try and determine whether pethidine alone affects breastfeeding or whether additional interventions have a part to play.

Sucking behaviour
A total of 15 studies investigated sucking behaviour outcomes, including frequency, duration of sucking, pressure, and movement and accuracy.

Five studies explored the effects of pethidine on sucking frequency. Of these, three reported a significantly higher frequency of sucking within the control groups when compared to groups who received pethidine (Ransjö-Arvidson et al, 2001; Hafström and Kjellmer, 2000; Riorddan et al, 2000). Wiener et al (1979) compared two groups of mothers who had received pethidine. In one of these groups, the neonates were given naloxone following birth. These neonates were found to have a significantly greater sucking frequency up to 48 hours following birth when compared to the neonates who were not given naloxone. Sanders-Phillips et al (1988) compared different doses of pethidine combined with and without anaesthesia and found that higher levels of pethidine and anaesthesia resulted in a significantly reduced sucking frequency, as measured by an artificial feeding machine. Although once confounding factors between the groups (for example, birthweight) were controlled for, there was no difference between the group who had low anaesthesia and either high (100mg-150mg) or low dose (under 75mg) pethidine administration.

One of the two studies, which looked at duration of sucking, found a significantly higher proportion of the control group sucked for longer than the pethidine group (Ransjö-Arvidson et al, 2001). While Sanders-Phillips et al (1988) found that infants who received higher levels of pethidine and anaesthesia had a significantly reduced duration of sucking than those given lower doses of both medications (p<0.01).

Wiener et al (1979) found that when they compared neonates who had been exposed to pethidine, with neonates who had had the effect of pethidine reversed by naloxone, the neonates that received the naloxone had significantly higher sucking pressure. Sanders-Phillips et al (1988) discovered an increase in analgesia (including pethidine) and anaesthesia did decrease neonates’ sucking pressure, but the difference did not attain significance.

Nissen et al (1995) compared a group who received pethidine with a control and found that the pethidine group took a significantly longer time for sucking movement to begin (p=0.01). Nissen et al’s second study (1997) compared the effects of dose-delivery time interval (DDI) and found that a short DDI (1.1 hours to 5.3 hours) significantly lowered the sucking movement score compared to a long DDI (8.1 hours to 9.9 hours) at 15, 30 and 45 minutes following birth (p=0.04, 0.04 and 0.05, respectively).

Hodgkinson et al (1978a) found that sucking was significantly affected in the intervention groups that received pethidine at two, four and 24 hours following birth; though all women also had general anaesthesia for the birth. Hodgkinson et al’s further research (1978b) also found that the pethidine group had the most depressed reflexes on observation, including sucking responses, compared to the control group. However, women in both groups had also received an epidural or general anaesthesia. Hodgkinson and Husain (1982) found a significant difference in sucking behaviour for days one, two and four, but not for days three and five. It was noted that the women in this study’s intervention group had also received bupivacaine as well as pethidine. The study by Richard and Alade (1990) found that there was a significantly lower percentage of neonates in the pethidine group who sucked accurately compared with the group who had not been exposed to pethidine (p<0.05). The remaining studies found no difference in sucking abnormalities associated with pethidine administration (Kuhnett et al, 1985; Busacca et al, 1982; Hodgkinson et al, 1979). The RCT by Busacca et al (1982) examined the incidence of neonates that failed the criterion for having an adequate sucking reflex within 48 hours of birth. No significant difference was found between the intervention and control group.

Flowchart 1. Selection process

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Figure 1 illustrates the difference between the intervention group (those who received pethidine) and controls (who did not receive pethidine) for five of the seven studies. Hodgkinson et al (1978b) does not report numerical results and Hodgkinson et al (1979) does not use a control, so both were omitted from the forest plot. A meta-analysis was not conducted due to heterogeneity between the studies.

Overall, the studies suggest that pethidine has a negative effect on sucking accuracy.

Age at first suck
All five studies that explore age at first suck found that significantly more neonates of mothers who had received pethidine did not breastfeed within the first two hours following birth compared with those who had not received pethidine (Ransjo-Arvidson et al, 2001; Cyriac, 1999; Nissen et al, 1997; 1995; Righard and Alade, 1990) (p<0.001, p=0.01, p=0.01, p<0.001, respectively). However, none of them featured intervention groups that had received pethidine alone. Some of the samples had also received pudendal blocks, epidurals and promethazine.

Neonatal behaviour related to breastfeeding
All five studies exploring neonatal behaviour outcomes for breastfeeding (alertness and rooting reflex) used a combination of Scanlon’s test and the Brazelton’s Neurobehavioural Assessment Scale (Brazelton and Nugent, 1995).

Three studies found that neonates of women who had received pethidine were significantly less alert following birth, when compared to those whose mothers had not received pethidine. The studies observed neonates within the first two hours and at four and 24 hours (p<0.001) (Hodgkinson et al, 1978a), days one and two (p<0.001) (Hodgkinson et al, 1978b), and days one and five (p<0.01) (Hodgkinson and Husain, 1982). Cyriac’s (1999) study concurs with these findings for the first two hours after birth. It recorded that 50% of neonates in the pethidine group were fully awake, 26% were easily arousable, 18% were drowsy and 6% were in a deep sleep. This compares with the neonates in the control group, who were found to be 84% fully awake, 16% arousable, 0% drowsy and 0% in a deep sleep. Although Hodgkinson et al’s (1979) study did not have a control, its findings were similar to that of Cyriac’s (1999) study, as it found that only 53% of neonates in the pethidine group had high alertness scores.

Two studies found that pethidine significantly affected neonates’ rooting reflex at two, four and 24 hours (p=0.005, 0.002 and 0.002 respectively) (Hodgkinson et al, 1978a) and on days one and two (p<0.001) (Hodgkinson et al, 1978b). Although Hodgkinson et al’s (1979) study did not have a control, it did report that only 26% of neonates, whose mothers had received pethidine, had a high rooting performance score. Further studies by Hodgkinson and Husain (1982) and Kuhnert et al (1985) found no significant difference between the intervention and control groups with regards to the rooting reflex. Figure 2 summarises the findings of these studies on rooting reflex. Two of Hodgkinson et al’s studies (1979; 1978b) have
been omitted from the analysis because one research paper does not report results in a format that allows its data to be combined and the other does not use a control. A meta-analysis was not conducted due to heterogeneity between the studies. Overall, the studies suggest that pethidine has a negative effect on neonatal breastfeeding behaviour, notably reduced alertness and rooting reflex.

**Initiation and duration of breastfeeding**

Cyriac (1999) found that 74% of women who had not received analgesia were able to start breastfeeding within two hours following birth. This compares to only 48% of women who had been given intrapartum pethidine (p<0.001). Although the studies by Nissen et al (1997) and Bick et al (1998) did not have control groups for comparison, their results are similar to Cyriac’s (1999) study as they found that 46% and 63% of women (respectively) who had received pethidine did not breastfeed for the first two hours. In addition, two further studies (Ransjo-Arvidson et al, 2001; Richard and Alade, 1990) also found that neonates in the pethidine group took significantly longer to initiate breastfeeding, when compared to the control groups (p<0.01 and p<0.001, respectively). In Cyriac’s study (1999), primigravidae in the pethidine group took longer to establish breastfeeding than multigravidae who had also received pethidine. No difference between parity and establishment of breastfeeding in the control group was found. Adams et al (2015) found that pethidine did not affect the initiation of breastfeeding (92% of the intervention group initiated breastfeeding versus 94% of the control group: p=0.2).

Al Tajir et al (2006) did not find that intrapartum pethidine had an effect on breastfeeding in the first 24 hours when compared with a control group. However, one-quarter of the 221 women who initiated breastfeeding, supplemented with additional fluids and lack of exclusive breastfeeding was found to be influenced by nationality rather than pethidine. Although Jordan et al (2009) do not single out pethidine when exploring the effect of opioids as a possible factor affecting breastfeeding at 48 hours, it can be assumed that pethidine is probably included, as it is the opioid most commonly used in labour. The study found a significant detrimental association between intrapartum opioids and breastfeeding at 48 hours (p<0.001).

Although Al Tajir et al (2006) did not find that intrapartum pethidine had an effect on breastfeeding at 24 hours following birth, there was an effect found at four weeks. Nationality continued to influence breastfeeding patterns, but women who received pethidine were significantly less likely to be exclusively breastfeeding at four weeks, compared to the control group (p=0.02).

At six weeks postpartum, two studies (Adams et al, 2015; Rajan, 1994) found that significantly more women from the control groups were breastfeeding compared to the women who had received intrapartum pethidine (p=0.03 and p=0.01, respectively). Studies by Halpern et al (1999) found no significant correlation between the length of breastfeeding and the use of opioids at six weeks. Riordan et al (2000) did not find an association between the length of breastfeeding and the use of opioids at six weeks. Riordan et al (2000) did not find an association between the length of breastfeeding and the use of opioids at six weeks either (p=0.54), but did find that women who had initially scored low using the IBFAT measuring tool breastfed for a significantly shorter period than those with higher scores (p<0.001). However, both studies had an intervention group in which women received intrapartum opioids and the results were not provided for individual opioids. The study by Fleet et al (2015) suggested that there were no significant differences between women who received fentanyl or pethidine in maintaining exclusive breastfeeding at six weeks. However, they did find that 24.4% of the pethidine group reported
an increase in difficulties in establishing breastfeeding after birth, with women reporting sleepy neonates, attachment issues and cracked nipples, compared to 7.5% in the self-administered fentanyl group (p<0.01).

One study (Yousefsfahi et al, 2013) revealed that at eight weeks postpartum nearly three times as many women were using formula in the control group (11%) compared to the pethidine group (4%). The findings were not significantly different (p=0.07), but the authors suggest that this is due to the small sample size. With a larger sample, they expected to find that the pethidine group were significantly more likely to be breastfeeding at eight weeks than the control group. They attribute this to the fact that mothers who receive pethidine in labour experience psychiatric relief during labour and are therefore more likely to breastfeed. However, the authors of this study admit that there were major limitations to their study including most women not participating in the follow-up investigation.

At three months following birth, the interviews conducted by Bick et al (1998) found that out of the 41 of the 906 women interviewed who had received pethidine, 26 (63%) started breastfeeding, but only 13 (32%) were breastfeeding at three months. Unfortunately no comparison was made with a control group and the women interviewed may have received additional analgesia. Although Al Tajir et al (2006) found that pethidine significantly affected breastfeeding at one month, there was no further significant association at six months.

Bai et al (2013) followed up mothers by interview at two, three, six and nine months. The study found that after controlling for confounding factors such as maternal age, parity and income, no significant impact of intrapartum interventions, including the receipt of pethidine during delivery, was found to either increase the risk of stopping breastfeeding or reduce the likelihood of exclusive breastfeeding. However, although pethidine alone did not impact on breastfeeding behaviour, women who experienced multiple interventions (induction, epidural, administration of pethidine and caesarean (CS) delivery) had a 7% increased risk of a shorter duration of long-term breastfeeding with each additional intervention.

Pethidine alone or multiple interventions
As many of the studies in this review also included other interventions, it raises the question as to whether it is pethidine alone that is affecting breastfeeding or the combination of pethidine with other interventions. Table 1 shows the 20 studies in this review that compare pethidine with a control and outlines the number and type of interventions and whether any significant differences were found between the groups. A number of studies state that some births were by CS, but did not specify the type of anaesthesia administered. Therefore an extra intervention has been added to the table.

Three of the four studies that included pethidine alone, with no other interventions, found that pethidine had no significant effect on sucking reflexes at 48 hours (Busacca et al, 1982), sucking abnormalities at 12 hours and three days (Kuhnert et al, 1985), and breastfeeding duration and cessation for up to one year (Bai et al, 2013). The fourth study found no significant difference for breastfeeding on day one and at six months, but at four week, the women in the pethidine group were less likely to be breastfeeding (p=0.02) (Al Tajir et al, 2006). A total of 14 studies, out of the 16 that had multiple interventions, concluded that pethidine had an effect on breastfeeding, while the remaining two studies found that pethidine had no significant effect (Yousefsfahi et al, 2013; Halpern et al, 1999). However, one study (Halpern et al, 1999) had a sample with only one woman who received pethidine who may or may not have had an assisted vaginal delivery or CS with CS anaesthesia, and the second study admitted major limitations (Yousefsfahi et al, 2013).

Table 1. The number of interventions and the effects on breastfeeding

<table>
<thead>
<tr>
<th>Study</th>
<th>No of interventions</th>
<th>Interventions</th>
<th>Significant difference</th>
<th>Outcomes</th>
</tr>
</thead>
<tbody>
<tr>
<td>Adams et al, 2013</td>
<td>3</td>
<td>P+E+AVD or CS</td>
<td>yes</td>
<td>BF at six weeks</td>
</tr>
<tr>
<td>Al Tajir et al, 2006</td>
<td>1</td>
<td>P</td>
<td>yes</td>
<td>BF at four weeks</td>
</tr>
<tr>
<td>Bai et al, 2013</td>
<td>1</td>
<td>P</td>
<td>no</td>
<td>Duration and cessation</td>
</tr>
<tr>
<td>Bick et al, 1998</td>
<td>3</td>
<td>P+AVD or CS+CS anaesthesia</td>
<td>yes</td>
<td>Establishing BF and BF at three months</td>
</tr>
<tr>
<td>Busacca et al, 1982</td>
<td>1</td>
<td>P</td>
<td>no</td>
<td>Sucking reflexes at 48 hours</td>
</tr>
<tr>
<td>Cypriac, 1999</td>
<td>1 or 2</td>
<td>P. Type of delivery is not mentioned</td>
<td>yes</td>
<td>Establishing BF</td>
</tr>
<tr>
<td>Halström and Kullmer, 2000</td>
<td>2</td>
<td>none woman had an E</td>
<td>yes</td>
<td>Sucking frequency and rhythm</td>
</tr>
<tr>
<td>Halpern et al, 1999</td>
<td>3</td>
<td>P+AVD or CS+CS anaesthesia</td>
<td>no</td>
<td>BF at six to eight weeks</td>
</tr>
<tr>
<td>Hodgkinson et al, 1978a</td>
<td>3</td>
<td>P+AVD+anaesthesia</td>
<td>yes</td>
<td>Alertness and reflexes</td>
</tr>
<tr>
<td>Hodgkinson et al, 1978b</td>
<td>2 or 3</td>
<td>P+CS</td>
<td>yes</td>
<td>Rooting, sucking and alertness</td>
</tr>
<tr>
<td>Hodgkinson and Hussein, 1982</td>
<td>3</td>
<td>P+I+CS</td>
<td>yes</td>
<td>Rooting reflex, sucking and alertness</td>
</tr>
<tr>
<td>Jordan et al, 2009</td>
<td>1 or 2</td>
<td>P+type of birth</td>
<td>yes</td>
<td>BF at eight weeks</td>
</tr>
<tr>
<td>Kuhlert et al, 1985</td>
<td>1 or 2</td>
<td>P</td>
<td>no</td>
<td>Sucking abnormalities at 12 hours and three days</td>
</tr>
<tr>
<td>Nissen et al, 1995</td>
<td>2</td>
<td>P+E or PB</td>
<td>yes</td>
<td>Sucking and rooting behaviour</td>
</tr>
<tr>
<td>Nissen et al, 1997</td>
<td>2</td>
<td>P+E or PB</td>
<td>yes</td>
<td>BF at two hours</td>
</tr>
<tr>
<td>Rajan, 1994</td>
<td>2</td>
<td>P, E+AVD or CS</td>
<td>yes</td>
<td>BF at six weeks</td>
</tr>
<tr>
<td>Ramraj-Aarrison et al, 2001</td>
<td>2</td>
<td>P or E or R or a combination</td>
<td>yes</td>
<td>Establishing BF, breastfeeding and swallowing behaviour</td>
</tr>
<tr>
<td>Richard and Alade, 1999</td>
<td>2</td>
<td>P+E</td>
<td>yes</td>
<td>Starting sucking and sucking abnormalities</td>
</tr>
<tr>
<td>Roeslan et al, 2000</td>
<td>2</td>
<td>P+AVD</td>
<td>no</td>
<td>Duration of BF at eight weeks</td>
</tr>
<tr>
<td>Yousefsfahi et al, 2013</td>
<td>3</td>
<td>P, I+AVD or CS</td>
<td>no</td>
<td>Duration of BF at eight weeks</td>
</tr>
</tbody>
</table>

Key: P: pethidine; E: epidural; PB: pudendal block; B: bupivacaine; AVD: assisted vaginal delivery; CS: caesarean; BF: breastfeeding.
The studies in this review indicate that there may be a correlation between the number of interventions and the effect on breastfeeding. However, as this was only explored as an outcome in one of the studies reviewed, it is essential for further studies to be conducted to confirm that pethidine alone has no effect on breastfeeding. Although pethidine alone may not affect breastfeeding, Adams et al (2015) discovered that women who receive intrapartum pethidine are more likely to need an assisted vaginal delivery (p=0.002). This assisted vaginal delivery would be an additional intervention leading to an increase in breastfeeding cessation by a further 7% (Bai et al, 2013). Therefore, even if pethidine is found to not directly affect breastfeeding, it may result in an increase of additional interventions and, consequently, indirectly reduce breastfeeding.

Limitations
This review and a recent Cochrane review highlight the paucity of RCTs that examine the effects of pethidine on breastfeeding (Jones et al, 2012). Conclusions drawn from non-RCTs may be challenged on grounds of selection bias, in which selection produces differences in prognostic characteristics related to the outcome between the control and intervention groups. Deeks et al (2003) compared the findings of RCTs with non-RCTs and found that non-RCTs are not always biased.

However, the study also revealed that due to systematic bias, the variables in a non-RCT can severely affect the validity of any findings and can cause different results for the same intervention. In observational studies, differences in the population, healthcare professionals’ approaches or hospital practices prior to selection need to be considered. Of particular concern in these studies were the following issues:
- Lack of control groups
- Additional drugs being given during labour
- Assessors not being blinded to the intervention
- Exclusion of neonates from studies who were not considered ‘healthy’
- Heterogeneous samples of mothers in terms of parity which are not analysed separately
- Additional interventions which are not analysed separately (birth by CS or assisted vaginal delivery)
- A number of other factors related to the neonates’ postpartum behaviour were rarely controlled for, for example, the duration of labour, which is thought to be lengthened by pethidine administration (Thomson and Hillier, 1994).

Thus, the findings of this review are tentative and require confirmation by robust RCTs. However, the current dearth of RCTs that have looked at the impact of opioids may be in part due to the ethical issues associated with randomising women to different types of analgesia and the implications of restricting women’s access or choice to different pain relief methods. This makes it a challenging process to keep the intervention and control groups clear of confounding variables.

Discussion
Overall the review suggests that pethidine may have a detrimental effect, whether directly or indirectly, on the sucking of neonates, namely reduced sucking frequency and duration, increased sucking inaccuracies and a longer time until the neonate’s first suck and for sucking movement to begin. The review also suggests that pethidine could affect neonatal behaviour related to breastfeeding, reducing both alertness and the rooting reflex. Finally the review suggests that pethidine may have an effect on the duration of breastfeeding up to six months following birth.

There are, of course, a range of different variables which can influence the uptake and duration of breastfeeding in the first days of birth. Given this, Reynolds (2011) argued that the type of analgesia used can play only a minor role in the success of breastfeeding. However, among those mothers who want to breastfeed, or who are undecided, difficulties experienced initiating breastfeeding, including a failure to develop a successful latch, pain and discomfort, will all impact on the likelihood of breastfeeding continuing (McLeod et al, 2002). This review points to pethidine as one potential impediment to successful early feeding, impacting the neonates’ ability to root and suck effectively.

Although the number of studies that have examined the impact of pethidine administration on breastfeeding at three and six months are limited, there is also evidence that early breastfeeding experience is related to breastfeeding duration. Studies suggested that breastfeeding duration up to three months is related to the timing of the first breastfeeding and the extent of mother-infant contact in the 72 hours after birth (Lawson and Tulloch, 1995) and that those who experience problems within the first four weeks are significantly more likely to discontinue full breastfeeding by six months of age (Scott et al, 2006). In addition, poor or unsatisfying early breastfeeding experience has been linked to maternal postpartum depression (Watkins et al, 2011). The study by Bai et al (2013) also suggested that the additive effect of multiple intrapartum interventions, of which pethidine is one, may contribute to breastfeeding cessation in the longer term.

In this review, it was not possible to differentiate breastfeeding outcomes between studies with different administration routes as few of the studies compared different forms of pethidine delivery (intramuscular versus intravenous) directly and several studies did not state which form of pethidine delivery was used. In the UK, pethidine tends to be administered via intramuscular injection. Limited research has suggested that there is little substantive difference in the pain relief achieved by intravenous versus intramuscular (NICE, 2014). There was also very little data available with regards to different doses of pethidine and how often they might be administered, with minimal variation in dosages with the majority falling between 75mg to 100mg in total. Small sample sizes restricted any substantive analysis by dose. The few studies that examined pethidine dosage contained a mixture of different analgesia in the intervention groups. Further exploration is required to determine whether dose and administration route of...
Pethidine plays a role in the effect on neonates.

In terms of timing of administration, pethidine tends to be given by the midwife for painful ineffective contractions in the latent stage or to relieve pain at the end of the first stage of labour. Studies that examined DDI reported discrepant findings, with Nissen et al (1997) reporting that a short DDI (1.1 hours to 5.3 hours) significantly lowered the sucking movement score compared to a long DDI (8.1 hours to 9.9 hours) at 15, 30 and 45 minutes following birth. While Kuhnert et al (1985) found longer DDIs resulted in less optimal performance on the neonatal behaviour scale and more abnormal reflexes in the neonate. Similarly, Reynolds (2011) argued that due to the delayed effects of pethidine, the maximum fetal exposure occurs if pethidine is given to the mother three to five hours before delivery, while neonatal effects are lessened if it is administered within one hour of birth. In addition, the impact on the mother of receiving pethidine close to delivery needs to be considered. The study by Rajan (1994), for example, found that pethidine appeared to lengthen the second stage of labour, and that some women who were given pethidine close to delivery reported being too impaired to focus on their baby after the birth. Clearly the timing of pethidine administration is crucial for midwives in practice, but most of the studies in this review failed to provide information about the exact timing of pethidine administration and how this affected neonatal breastfeeding behaviour (Teimoori et al, 2011).

In addition, the administration of naloxone at birth might reduce the effects of pethidine on the neonate, as suggested in the study by Wiener et al (1979). However, a Cochrane review found insufficient evidence to recommend the routine use of naloxone in neonates exposed to maternal opiate analgesia (Moe-Byrne et al, 2013).

In terms of efficacy, Reynolds (2011) suggested that using pethidine for pain relief is relatively pointless as the dose needed to be truly effective would be at a blood concentration too high for the safety of the fetus. Equally significant is research that suggested the pain relief offered by pethidine from the mother’s perspective may not be as great as midwives have previously assumed (Chamberlain et al, 1993). Alternatives may include diamorphine, which may provide greater pain relief (Wee et al, 2011), fentanyl, which provides as much pain relief as pethidine but has less negative effect on breastfeeding (Fleet et al, 2015), or entonox (nitrous oxide), which does not depress neonates’ respiratory system. In addition to its superior safety, studies found that women receiving entonox had significantly less pain and were significantly more satisfied with the pain relief than women who were given pethidine (Teimoori et al, 2011; Holdcroft and Morgan, 1974).

Conclusion

Overall, this review strongly suggests that pethidine may have a detrimental effect, whether directly or indirectly, on breastfeeding for up to six months following birth. In light of this review and the low breastfeeding rate in the UK, healthcare professionals may wish to re-evaluate the use of pethidine in labour and consider whether its use should be continued. Particularly as The Lancet’s key message clearly stated that: ‘Success in breastfeeding is not the sole responsibility of a woman – the promotion of breastfeeding is a collective societal responsibility’ (Rollins et al, 2016: 491). In the meantime, for those women who do receive pethidine, healthcare professionals need to be aware that these women may need more assistance and support to initiate and continue with breastfeeding. Antenatally, women should be provided with as much information as possible about the potential advantages and disadvantages of pethidine in labour to allow them to make an informed choice.

References


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References continued


