The impact of epidural analgesia on breastfeeding: a prospective cohort study

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Judy Simpson
Jane Thompson
David Ellwood

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University of Sydney
Background

• Anecdotal reports that women who had epidurals were experiencing more difficulty establishing breastfeeding
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• Effects of epidurals on some obstetric consequences well established but impact on breastfeeding is less clear
Previous studies

• Jordan et al (2005), UK, 425 primips: association between epidurals and bottle feeding (P=0.02), also demonstrated a dose-response relationship between fentanyl and bottle feeding
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- Halpern et al (1999), Riordan et al (2000) and Radzyminski et al (2003), 3 small ($56 \leq n \leq 189$) North American studies: no association between epidurals and breastfeeding although Riordan et al found an association between epidurals and reduced neonatal suckling scores
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- Kiehl (1996), US, 108 women: reduced rates of breastfeeding among privately insured women with an epidural (30% vs 50%).
Aim

To determine any association between intrapartum epidural analgesia and

1) breastfeeding in the first week postpartum and

2) breastfeeding cessation during the first 24 weeks postpartum
Methods

- Population-based, prospective cohort study
- Women aged ≥16 years, gave birth March to October 1997 in the ACT
- Excluded if baby admitted to NICU or adopted, or if critically ill themselves, also multiple pregnancies
- 1st questionnaire in 1st week (day 4) — included sociodemographic characteristics of mother and partner, obstetric details and information on breastfeeding
- 3 more questionnaires at 8, 16 and 24 weeks post-partum
Main outcome measure

• Self report of breastfeeding, 3 levels:
  » Fully breastfeeding
  » Partially breastfeeding
  » No breastfeeding

• Asked in all 4 surveys
• If stopped, when, to the nearest 2 weeks
Main exposure variable

Type of labour analgesia, 5 categories:

1. non-pharmacological (natural methods such as breathing exercises, massage, moving about, hypnosis)
2. gas (nitrous oxide, no other pharmacological agent)
3. pethidine (+/- gas)
4. epidural* (+/- pethidine and/or gas)
5. GA (+/- any of above)

* epidural solution in use at the time was bupivacaine + fentanyl
Data analyses

- $\chi^2$ test for associations between demographic and intrapartum factors and breastfeeding in first week
- ORs estimated using logistic regression models to determine predictors of partial and no breastfeeding in first week
- Kaplan-Meier survival probability estimates to summarise time to cessation of breastfeeding during the first 24 weeks postpartum
- HR of breastfeeding cessation for each analgesia type estimated by fitting a Cox proportional hazards regression model
- All analyses in SAS version 8.2
Results

- 1295 (70%) women
- 15 (1.2%) gave birth to twins – excluded
- 1178 (92%) retained to 24 weeks
- 416/1260 (33%) women had epidurals
- All women who gave birth vaginally with epidurals also used pethidine
- Type of intrapartum analgesia associated with:
  » maternal age
  » parity
  » delivery type
  » onset of labour
Breastfeeding at 1, 8, 16 & 24 weeks postpartum

- **1 week**: 100% no breastfeeding
- **8 weeks**: 90% no breastfeeding, 10% partially breastfeeding
- **16 weeks**: 70% no breastfeeding, 30% partially breastfeeding
- **24 weeks**: 50% no breastfeeding, 50% partially breastfeeding

Legend:
- Pink: no breastfeeding
- Light blue: partially breastfeeding
- Yellow: fully breastfeeding
Breastfeeding in the first week

- Compared with fully breastfeeding, predictors of partial breastfeeding differed from predictors of no breastfeeding
- No intrapartum factors were associated with no breastfeeding
- Maternal education was the only factor associated with no breastfeeding
Maternal education and no breastfeeding in the first week

<table>
<thead>
<tr>
<th>Degree</th>
<th>OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Degree</td>
<td>1</td>
</tr>
<tr>
<td>Trade/certificate/diploma</td>
<td>3.71 (1.68 to 8.18)</td>
</tr>
<tr>
<td>Year 12</td>
<td>3.11 (1.42 to 6.79)</td>
</tr>
<tr>
<td>Up to year 11</td>
<td>7.63 (3.72 to 15.56)</td>
</tr>
</tbody>
</table>

No breastfeeding
(compared with fully breastfeeding)
Predictors of partial breastfeeding in the first week

- **Intrapartum variables:**
  - Analgesia type ($P<0.0001$)
  - Delivery type ($P<0.0001$)
  - Onset of labour ($P=0.0003$)

- **Parity ($P=0.0006$)**
## Partial breastfeeding in the first week by parity

<table>
<thead>
<tr>
<th></th>
<th>Partial breastfeeding (compared with fully b/f)</th>
<th>Adjusted* OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Multiparous</strong></td>
<td>1 (referent group)</td>
<td></td>
</tr>
<tr>
<td><strong>Primiparous</strong></td>
<td>2.59 (1.51 to 4.45)</td>
<td></td>
</tr>
</tbody>
</table>

*adjusted for analgesia
### Partial breastfeeding in the first week by analgesia type

<table>
<thead>
<tr>
<th>Analgesia Type</th>
<th>Adjusted OR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-pharmacological</td>
<td>1 (referent group)</td>
</tr>
<tr>
<td>Gas</td>
<td>1.46 (0.48 to 4.45)</td>
</tr>
<tr>
<td>Pethidine</td>
<td>0.97 (0.34 to 2.75)</td>
</tr>
<tr>
<td>Epidural</td>
<td>3.61 (1.57 to 8.29)</td>
</tr>
<tr>
<td>GA</td>
<td>9.25 (3.22 to 26.59)</td>
</tr>
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<td>3.61 (1.57 to 8.29)</td>
</tr>
<tr>
<td>GA</td>
<td>9.25 (3.22 to 26.59)</td>
</tr>
<tr>
<td>Epidurals (vaginal only)</td>
<td>2.33 (0.92 to 5.90)</td>
</tr>
</tbody>
</table>

*adjusted for parity
Partial breastfeeding in the first week by delivery type

<table>
<thead>
<tr>
<th>Delivery Type</th>
<th>Adjusted* OR</th>
<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Vaginal</td>
<td>1</td>
<td>(referent group)</td>
</tr>
<tr>
<td>Instrumental</td>
<td>1.82</td>
<td>(0.91 to 3.65)</td>
</tr>
<tr>
<td>CS no labour</td>
<td>4.41</td>
<td>(2.25 to 8.64)</td>
</tr>
<tr>
<td>CS with labour</td>
<td>6.22</td>
<td>(3.15 to 12.30)</td>
</tr>
</tbody>
</table>

*adjusted for parity
### Partial breastfeeding in the first week by labour onset

<table>
<thead>
<tr>
<th></th>
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<th>(95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Partial breastfeeding (compared with fully b/f)</td>
<td></td>
<td></td>
</tr>
<tr>
<td>Spontaneous</td>
<td>1</td>
<td>(referent group)</td>
</tr>
<tr>
<td>Induced</td>
<td>1.86</td>
<td>(1.07 to 3.22)</td>
</tr>
<tr>
<td>No labour</td>
<td>3.73</td>
<td>(1.92 to 7.24)</td>
</tr>
</tbody>
</table>

*adjusted for parity
No association with partial breastfeeding

- Education
- Age
- Hospital type (private or public)
- Small for gestational age infant
- Length of labour
Outcomes for women partially breastfeeding in first week

Women who were partially breastfeeding in first week were almost twice as likely to have ceased breastfeeding by 24 weeks compared with women who were fully breastfeeding in the first week

(RR 1.91, 95% CI 1.57 to 2.31)
Breastfeeding at 8, 16 and 24 weeks by breastfeeding in the first week

- **No breastfeeding**
- **Partially breastfeeding**
- **Fully breastfeeding**

<table>
<thead>
<tr>
<th>Weeks Postpartum</th>
<th>Partially Breastfeeding 1st Week</th>
<th>Fully Breastfeeding 1st Week</th>
</tr>
</thead>
<tbody>
<tr>
<td>8</td>
<td></td>
<td></td>
</tr>
<tr>
<td>16</td>
<td></td>
<td></td>
</tr>
<tr>
<td>24</td>
<td></td>
<td></td>
</tr>
<tr>
<td>8</td>
<td></td>
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<td></td>
<td></td>
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<tr>
<td>24</td>
<td></td>
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</table>
Breastfeeding difficulties in the first week postpartum

- Predictors of breastfeeding difficulties similar to predictors of partial breastfeeding

- Women who reported breastfeeding difficulties twice as likely to have had an epidural than women who did not report difficulty (adjusted OR 2.04, 95% CI 1.39 to 3.00)

- This association remained significant when restricted to vaginal deliveries (adjusted OR 1.75, 95% CI 1.13 to 2.70)
Breastfeeding cessation in the first 24 weeks

- Breastfeeding cessation = women fully or partially breastfeeding in the first week later reporting not breastfeeding at all

- Predictors of breastfeeding cessation in the first 24 weeks (P<0.0001):
  - Intrapartum analgesia
  - Maternal age
  - Maternal education
Analgesia and breastfeeding cessation in the first 24 weeks

<table>
<thead>
<tr>
<th>Intrapartum analgesia</th>
<th>Adjusted* HR (95% CI)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Non-pharmacological</td>
<td>1 (referent group)</td>
</tr>
<tr>
<td>Gas</td>
<td>1.20 (0.83 to 1.74)</td>
</tr>
<tr>
<td>Pethidine</td>
<td>1.67 (1.23 to 2.25)</td>
</tr>
<tr>
<td>Epidural</td>
<td>2.02 (1.53 to 2.67)</td>
</tr>
</tbody>
</table>

*adjusted for maternal age and education
Maternal age and breastfeeding cessation in the first 24 weeks

<table>
<thead>
<tr>
<th>Maternal age</th>
<th>Adjusted* HR (95% CI)</th>
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<tbody>
<tr>
<td>30+</td>
<td>1 (referent group)</td>
</tr>
<tr>
<td>25–29</td>
<td>2.21 (1.76 to 2.78)</td>
</tr>
<tr>
<td>20–24</td>
<td>2.67 (1.99 to 3.58)</td>
</tr>
<tr>
<td>16–19</td>
<td>3.19 (1.82 to 5.61)</td>
</tr>
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</table>

*adjusted for analgesia and maternal education
## Maternal education and breastfeeding cessation in the first 24 weeks

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<td>1.67 (1.24 to 2.26)</td>
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<tr>
<td>Year 12</td>
<td>2.01 (1.53 to 2.64)</td>
</tr>
<tr>
<td>Up to year 11</td>
<td>2.45 (1.84 to 3.27)</td>
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*adjusted for analgesia and maternal age
No association with breastfeeding cessation in first 24 weeks

- Parity
- Marital status
- Type of delivery
- Onset or length of labour
- Mother’s country of birth
- Maternal employment in the past 12 months
- Plan to return to work
- Assisted reproductive technologies
- Gender of baby
- Small for gestational age
- Measures of social support, resilience and vulnerability
Summary

• No overlap of predictors of partial and no breastfeeding in the first week
• No intrapartum factors associated with not initiating breastfeeding
• Women with low levels of education at increased risk of not initiating breastfeeding and stopping in the first 24 weeks
• Analgesia associated with partial breastfeeding and breastfeeding difficulty in the first week and stopping in the first 24 weeks
Possible explanations

- Association between analgesia and breastfeeding could be due to:
  - Confounding
Possible explanations

• Association between analgesia and breastfeeding could be due to:
  » Confounding
  » Pharmacological effect of analgesic agents
Fentanyl

- Fentanyl component of epidurals may be associated with sleepy infants and difficulty establishing breastfeeding

- Lower neurologic and adaptive capacity scores among infants whose mothers had epidurals with fentanyl (Loftus et al, 1995)

- Jordan et al (2005) found an association between epidurals and bottle feeding (P=0.02) and demonstrated a dose-response relationship between fentanyl and bottle feeding

- RCT (Beilin et al, 2005), 177 women who had previously breastfed were randomised to receive an epidural containing either no fentanyl, intermediate dose fentanyl (up to 150μg fentanyl) or high dose fentanyl (>150μg fentanyl). Women randomised to the high dose fentanyl group were more likely to have stopped breastfeeding at six weeks postpartum
Limitations

• Limited information, eg no information on analgesic agents used for individual women

• Some or all of the association could be due to confounding
Conclusion

• Whatever the underlying mechanism, women who chose/needed epidural analgesia more likely to:
  » report difficulty breastfeeding in the first week
  » partially breastfeed in the first week
  » stop breastfeeding in the first 24 weeks
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• ‘If intrapartum analgesics do interfere with breastfeeding, this might, arguably, be the adverse drug reaction with the greatest public health consequences’. (Sue Jordan, *International Breastfeeding Journal* 2006. 1:25)
Acknowledgements

- Mary Lantry
- Angela Smith
- Christine Roberts
- Judy Simpson
- Jane Thompson
- David Ellwood
- Marian Currie
- The midwives who recruited women
- All the women who participated

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- NHMRC
- The Canberra Hospital Private Practice Fund
- The Canberra Hospital Auxiliary
- The Nurses' Board of the ACT
- The ACT Department of Health & Community Care
Epidural babies can’t get grip on what’s breast

David King

WOMEN who give birth with the aid of pain-relieving epidurals find it harder to breastfeed than those who give birth naturally, an Australian study has found.

The research suggests some of the drugs used in epidurals make their way into babies’ bloodstreams, subtly affecting their brains and development for weeks afterwards — including making them less willing to breastfeed. The study by University of Sydney epidemiologist Sirinda Torvaldsen adds to a growing body of knowledge that makes a link between the use of the pain-killing drug fentanyl in epidurals and problems with breastfeeding. During an epidural a catheter is inserted into the spine to allow the infusion of pain-killing drugs. These deaden the nerves that relay sensations of pain from the lower body.

In a commentary on the research, published today in International Breastfeeding Journal, British scientist Sue Jordan suggests the impact of epidurals on breastfeeding should be officially classed as an “adverse drug reaction”. Dr Jordan, senior lecturer in applied therapeutics at Swansea University, said women given the infusions should be offered extra support to stop their infants being “disadvantaged by this hidden, but far-reaching, adverse drug reaction”.

Dr Torvaldsen and her colleagues studied 1280 women who had given birth in the ACT, of whom 416 had an epidural. They found that 93 per cent of the women breastfed their baby in the first week, but those who had received epidurals generally had more difficulty in the days immediately after birth.

By the time six months had passed, the women who had been given epidurals were twice as likely to have stopped breastfeeding, even after allowing for factors such as maternal age and education. The authors suggest the most likely cause of the problem was fentanyl, an opioid widely used as one of the components of epidurals. Such drugs pass quickly into the bloodstream and easily cross the placenta to reach the unborn baby.

Dr Torvaldsen said she conducted the research after speaking to lactation consultants who had noticed that since the addition of fentanyl in epidurals they had seen more women having problems breastfeeding.

She said her research added to other studies in the area, particularly a Canadian study that examined fentanyl dosages and breastfeeding outcomes. The Canadian study of 177 mothers found they were less likely to be breastfeeding if they had been given an epidural with fentanyl. Joy Heads, a lactation consultant at Sydney’s Royal Hospital for Women, said similar problems had been seen when the pain-killer pethidine had been given to mothers in late stages of labour. She said some newborn babies had lost their “sucking coordination” if the mother had an intra-muscular injection of the pethidine in the last half hour of a normal delivery.

Additional reporting: Sunday Times

Full text of journal article plus commentary freely available at:
www.internationalbreastfeedingjournal.com