EFFECT OF EPIDURAL ANALGESIA ON LABOUR, MODE OF DELIVERY AND NEONATAL OUTCOME

IRENA ALEKSIOSKA PAPESTIEV
University Clinic of Obstetrics and Gynaecology, Skopje, Macedonia
For most women labor causes severe pain, similar in degree to that caused by complex regional pain syndromes or the amputation of a finger.

ACOG and ASA state, “In the absence of a medical contraindication, maternal request is a sufficient medical indication for pain relief during labor.”

*ACOG committee opinion #295: pain relief during labor. Obstet Gynecol 2004;104:213-213
- Transcutaneous electrical nerve stimulation (TENS)
- Hypnosis
- Acupuncture
- Training in a variety of relaxation techniques
- Pharmacological method of pain relief
Timeline illustrating major developments in the use of neuraxial analgesia for labour

- 1900: Total anaesthesia of the lower body in 6 parturients after subarachnoid injection of cocaine
- 1905: Procaine first synthesized
- 1910: Williams Taylor
  - Intraepidural analgesia
- 1917: Oscar Kreis
  - Total anaesthesia of the lower body in 6 parturients after subarachnoid injection of cocaine
  - Procaine first synthesized
- 1919: Fernand Cathelin
  - Intraepidural analgesia on the sacral canal for urethral procedures
- 1920s: Fidel Paggiés Mirave
  - Lumbar epidural analgesia
- 1931: Eugen Bogdan Auerel
  - Continuous caudal block
  - Pneumatic + soft catheter (similar to ureteric catheter)
- 1933: AM Dogliotti
  - Loss of the resistance technique
  - Alberto Gutierrez
  - Hanging drop to identify the epidural space
- 1942: Hingson & Edwards
  - Continuous lumbar epidural anaesthesia
  - Continuous epidural block for surgical procedures
  - Continuous epidural block for labor, delivery and caesarean section
- 1945: Udy
  - Continuous epidural anaesthesia for surgical procedures
- 1946: Lidocaine first synthesized
- 1948: Bupivacaine first synthesized
- 1957: Lee
  - First catheter with closed tip and lateral holes to reduce the trauma during the insertion
- 1961: Malos bit is replaced with a polyvinyl catheter
- 1962: Goldstein
  - Discovery of opioid receptors
- 1969: Morgan
  - Combined spinal-epidural for labor analgesia
  - Single space needle through the needle
  - Local anesthetic + opioids
- 1980: Opioids in the epidural space for labor analgesia
- 1990s: Patient Controlled Epidural Analgesia for labor pain
- 1990s: Ropivacaine first synthesized
  - Use of low dose/four concentration of local anesthetic
August Bier - “cocainization of the spinal cord”

Oskar Kreis- total anesthesia of lower body in six laboring parturients after subarachnoid injection of cocaine.

1909 Walter Stoeckel (1871-1961) a pioneer of regional analgesia in obstetrics (141 cases of caudal epidural analgesia for labor pain procaine (novocaine))*

1931 Eugen Bogdan Aburel (use of a catheter-placed into the caudal epidural space)

1960s, the lumbar epidural replaced caudal analgesia as the preferred technique.

1970s, permitted administration of pain relief early in labor, rather than only at the time of delivery.

1970s and 1980s several improvements.

1988, Gambling et al described “patient-controlled epidural analgesia” for pain control during labor.
Lumbar epidural analgesia offers a safe and effective method of pain relief during labour. It is a versatile technique that may be extended to provide anaesthesia for operative delivery. The benefits of epidural analgesia include effective pain relief without appreciable motor block, reduction in maternal catecholamines and a mean to achieve rapid surgical anesthesia.

Epidural analgesia is now-a-days a popular method of pain relief but it may interfere with normal mechanism of labour. Trials of delayed pushing have occurred about the association between epidural analgesia, instrumental deliveries and prolongation of second stage of labour, which is because of weak desire to push due to diminution of bearing down reflex and reduced uterine activity. Other maternal outcomes include second stage caesarean section, episiotomy, perineal injuries, maternal fever, partial block, headache, urinary retention and hypotension. Neonatal outcomes include low Apgar score, need for positive pressure ventilation, birth trauma and admission to neonatal intensive care unit.*,**,**


**Kuczkowski KM. Labor pain and its management with the combined spinal-epidural analgesia: what does an obstetrician need to know? Arch Gynecol Obstet 2007;275:183-5

***Sadia Anwar, Muhammad WaseemAnwar, Attiya Ayaz, Nargis Danish, Sajjad Ahmad, Effect of epidural analgesia on labour and its outcomes. J Ayub Med Coll Abbottabad 2015;27(1)
To assess the outcome of labour in women with effective epidural analgesia in terms of duration of labour, mode of delivery and neonatal outcome, compared with no pain relief during labour.
Design of the study

- single blind placebo experimental study
- 800 pregnant women divided at two groups
  - Group A distilled water
  - Group B epidural analgesia

Inclusion criteria

- women at term (37-41 week of gestation)
- spontaneous or induced labour
- singleton cephalic presentation
- adequate pelvic dimensions
- reactive CTG

Exclusion criteria

- obstetrical complications
- twin pregnancy
- previous cesarean section
- Relative cephalopelvic disproportion
- Maternal medical problems
MATERIAL AND METHODS

- Informed consent and diagnose of labour
- In group A parturients, no epidural analgesia
- In group B parturients, epidural analgesia was given by anesthetist
- In both groups
  (fetal heart rate was monitored, progress of labour, duration, intensity, interval of uterine contractions, vaginal examination, and baby was evaluated in terms of Apgar scores by neonatologist)
MATERIAL AND METHODS

The outcome in both groups:
- Duration of second stage of labour
- Mode of delivery
- Neonatal Apgar scores at 1 minute and 5 minutes and any need for bag and mask resuscitation were recorded

SPSS version 11
For the comparisons of two groups regarding the outcome variables, Chi-square test was used. P value $\leq 0.05$
RESULTS
## Duration of second stage of labour between non-epidural and epidural groups

<table>
<thead>
<tr>
<th>Duration of second stage of labour</th>
<th>Non-epidural</th>
<th>Epidural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>&lt;1 hour</td>
<td>380 (95%)</td>
<td>336 (84%)</td>
<td>716</td>
</tr>
<tr>
<td>1 hour or &gt;1 hour</td>
<td>12 (3%)</td>
<td>24 (6%)</td>
<td>36</td>
</tr>
<tr>
<td>2 hours or &gt;2 hours</td>
<td>8 (2%)</td>
<td>40 (10%)</td>
<td>48</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>400</td>
<td>800</td>
</tr>
<tr>
<td>P&lt;0.008</td>
<td></td>
<td></td>
<td></td>
</tr>
</tbody>
</table>

Duration of second stage of labour between non-epidural and epidural groups

- **Non-epidural**
  - <1 hour: 380 (95%)
  - 1 hour or >1 hour: 336 (84%)
  - 2 hours or >2 hours: 12 (3%)
  - >2 hours: 8 (2%)

- **Epidural**
  - <1 hour: 40 (10%)
  - 1 hour or >1 hour: 40 (10%)
  - 2 hours or >2 hours: 40 (10%)
  - >2 hours: 40 (10%)
### Mode of delivery between non-epidural and epidural groups

<table>
<thead>
<tr>
<th>Mode of delivery</th>
<th>Non-epidural</th>
<th>Epidural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>SVD with episiotomy</td>
<td>288 (72%)</td>
<td>249 (62.25%)</td>
<td>537</td>
</tr>
<tr>
<td>Instrumental delivery</td>
<td>16 (4%)</td>
<td>68 (17%)</td>
<td>84</td>
</tr>
<tr>
<td>Cesarean section</td>
<td>96 (24%)</td>
<td>83 (20.75%)</td>
<td>179</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>400</td>
<td>800</td>
</tr>
</tbody>
</table>

P<0.00

Mode of delivery between non-epidural and epidural groups

- SVD with episiotomy
  - Non-epidural: 288 (72%)
  - Epidural: 249 (62.5%)
- Instrumental delivery
  - Non-epidural: 16 (4%)
  - Epidural: 68 (17%)
- Cesarean section
  - Non-epidural: 96 (24%)
  - Epidural: 83 (20.75%)

Legend:
- Non-epidural
- Epidural
Apgar scores at 1st minute in non-epidural and epidural groups

<table>
<thead>
<tr>
<th>Apgar scores at 1st minute</th>
<th>Non-epidural</th>
<th>Epidural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>7/10</td>
<td>152 (38%)</td>
<td>172 (43%)</td>
<td>400</td>
</tr>
<tr>
<td>8/10</td>
<td>204 (51%)</td>
<td>196 (49%)</td>
<td>400</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>400</td>
<td>800</td>
</tr>
</tbody>
</table>

P<0,00

* Menz-Orieux C, Linet T, Philippe HJ, Boog G. Delayed versus immediate pushing in the second stage of labor for nulliparous parturient with epidural analgesia: a meta-analysis of randomized trial. J Gynecol Obstet Biol Repord(Paris)2005;34;440-7
Apgar scores at 1<sup>st</sup> minute in non-epidural and epidural groups
Apgar scores at 5th minute in non-epidural and epidural groups

<table>
<thead>
<tr>
<th>Apgar scores at 5th minute</th>
<th>Non-epidural</th>
<th>Epidural</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>8/10</td>
<td>268 (67%)</td>
<td>288 (72%)</td>
<td>556</td>
</tr>
<tr>
<td>9/10</td>
<td>132 (33%)</td>
<td>112 (28%)</td>
<td>144</td>
</tr>
<tr>
<td>Total</td>
<td>400</td>
<td>400</td>
<td>800</td>
</tr>
</tbody>
</table>

P<0.645

* Menz-Orieux C, Linet T, Philippe HJ, Boog G. Deleyed versus immediate pushing in the second stage of labor for nulliparous parturient with epidural analgesia: a meta-analysis of randomized trial. J Gynecol Obstet Biol Repord(Paris)2005;34;440-7
Apgar scores at 5th minute in non-epidural and epidural groups
CONCLUSIONS

- Epidural analgesia provides excellent pain relief but prolong the duration of second stage of labour and increased instrumental vaginal birth.
- Epidural analgesia had no statistically significant impact on the risk of caesarean section.
- Epidural analgesia did not appear to have an immediate effect on neonatal status.
CONCLUSIONS

- Regarding obstetric outcome, one should always remember that the course of labour is influenced by many factors like adequacy of pelvis, size of baby and obstetric management apart from the analgesia.

- These variables should be critically evaluated while considering the effect of epidural analgesia on obstetric outcomes.