The Croatian viewpoint for labour analgesia and anaesthesia

Dragica Kopic, MD, Department of Anaesthesiology and Intensive Care Unit, University Hospital Split
Split University Hospital

- Split University Hospital is the central health facility in the southern Croatian area.
- This institution as a regional hospital, revolves around one million Croatian citizens.
- About 500,000 residents of the southern part of neighboring RBH,
- As well as around 500,000 tourists during the season.
- This makes the number of potential two million people.
Split University Hospital in 2012

- Beds: 1539
- Number of employees: 3325
- Medical workers: 2463
  - Medical doctors-specialists: 460
  - Residents: 123
  - Biochemists: 15
  - Nurses + lab workers: 1865
- Support staff: 862
Department of Anesthesia and Intensive Care Unit

- Number of employees: 167
- Anesthesiologists: 46
- Anesthesia residents: 13
- Anesthesia assistants: 37
- Nurses: 62
- Number of anesthesia/per year: 22,516
- Operating theaters: 20
- ICU beds: 18
Regional anesthesia in Croatian Obstetrics

- In Croatia epidural analgesia for labour and delivery was introduced 40 years ago in Sveti Duh (Zagreb) Hospital and Petrova Clinic (Zagreb), simultaneously.

- At the same time, in Rijeka Clinical Center caudal block was performed for the first time.

- However, it took some 10 years or more to establish complete pain relief service in those hospitals.
Regional anesthesia in Obstetrics, Split University Hospital

- In 1990, some effort was made in order to establish pain relief service for labour and delivery.
- But during the war all anesthesiologist were engaged in caring for war casualties.
- Needs of parturients were put on side until 2003.
Regional anesthesia in Obstetrics
University Hospital Split (2003)

- In 2003, in the University Hospital Split, labour epidural analgesia was performed at the rate of < 0.03%.

- Regional anesthesia for CS was performed with rate of 4%.

- The introduction of regional anesthesia techniques in obstetrics wasn’t easy and always welcomed.
## Type of analgesia for vaginal delivery 2003

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Zagreb</th>
<th>Rijeka</th>
<th>Split</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Total Delivery Number</strong></td>
<td>1997</td>
<td>2493</td>
<td>3283</td>
</tr>
<tr>
<td><strong>Epidural Analgesia</strong></td>
<td>345 (17)</td>
<td>494 (19)</td>
<td>11 (&lt;1)</td>
</tr>
<tr>
<td><strong>Spinal Analgesia</strong></td>
<td>0</td>
<td>0</td>
<td>0</td>
</tr>
<tr>
<td><strong>Narcotic-Meperidine</strong></td>
<td>1012 (51)</td>
<td>679 (27)</td>
<td>727 (22)</td>
</tr>
<tr>
<td><strong>Nothing</strong></td>
<td>640 (32)</td>
<td>1320 (53)</td>
<td>2547 (77.6)</td>
</tr>
</tbody>
</table>

(%)
Survey of Obstetrics anaesthesia Practices in Croatia in 2003

Short questionnaires were sent to Croatian anaesthesiology departments regarding analgesia and anaesthesia practices for childbirth during 2002 and 2003.

• 3 university hospitals and 5 city hospitals
• 14,133 deliveries (35% of registered Croatian birth for 2002)

Results:

<table>
<thead>
<tr>
<th>2003</th>
<th>Anaesthesia for C/S (%)</th>
<th>Analgesia for SVD (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Hospital</td>
<td>GA</td>
</tr>
<tr>
<td>University</td>
<td>61</td>
<td>39</td>
</tr>
<tr>
<td>City</td>
<td>93</td>
<td>7</td>
</tr>
</tbody>
</table>
Epidural Analgesia in University Hospital Split

LEA< 0.03% till 2004

- Increased parturient request for EA
- Kybele Foundation sponsored additional education of two anesthesiologist
- Established team work between obstetricians and anesthesiologist

September 2004

- Established Labor Pain relief service
- Childbirth education classes for parturient and family members were introduced
- Field of action and responsibility of every team member is defined
- Indication for EA is established by obstetricians
- Contraindication for EA is established by anesthesiologist
“The First Obstetric Anesthesia Meeting”
Bol, Island Brač, Croatia 2005

Kybele team in capital town

Kybele team on the way to Bol, the island Brač
Regional anesthesia in Obstetrics 2005

- In September 2005, “The First Obstetric Anesthesia Meeting” was held, which was envisaged as a symposium and practical educational event.

- Kybele lecturers (12 anesthesiologists, an internal medicine doctor and a midwife) have been working and living for 15 days in Croatia.
The two day symposium was attended by 67 anesthesiologists from Croatia and 7 from neighboring countries.

Practical education was conducted in 9 hospitals where Kybele instructors worked in ORs and delivery rooms and educated local practitioners on techniques of regional anesthesia.
Delivery department in the old building
One of the ladies who had a privilege to give a birth with epidural analgesia.
Epidural labour pain Relief

“The most impressive effect (of epidural analgesia) is to bring TRANQUILLITY and HUMANITY to delivery suite, as well as HAPPINESS and DIGNITY to a woman on one of the most important occasions in her life.”

Cesarean section performed in spinal anaesthesia
Regional anaesthesia techniques for labour epidural analgesia

- Epidural analgesia
- Combined Spinal Epidural (CSE) Analgesia
- Single Shot Spinal (SSS) analgesia
Guidelines for regional anesthesia in obstetrics

- Complete resuscitation equipment
- Performed by specialist only (resident under supervision)
- Obstetricians’ examination and consent is prerequisite
- Venous access is mandatory
- Basic monitoring of mother and fetus during the entire procedure
- Available personnel to perform an emergency CS
- Standards for postanaesthetic monitoring
# Guidelines for regional anesthesia in obstetrics

<table>
<thead>
<tr>
<th>Table 5.2 Guidelines for regional anesthesia in obstetrics&lt;sup&gt;a&lt;/sup&gt;</th>
</tr>
</thead>
<tbody>
<tr>
<td>1. Appropriate resuscitation equipment and drugs must be immediately available, including: oxygen, suction, equipment to maintain an airway and perform endotracheal intubation, ability to provide positive pressure ventilation, and ability to perform advanced cardiac life support.</td>
</tr>
<tr>
<td>2. Regional anesthesia should be initiated by or under the medical direction of a physician with appropriate privileges.</td>
</tr>
<tr>
<td>3. Regional anesthesia should not be initiated until the patient is examined by a qualified individual and the obstetrician with the knowledge of maternal and fetal status and the progress of labor approves of the labor anesthetic and is readily available to supervise labor and manage any complications that may arise.</td>
</tr>
<tr>
<td>4. An intravenous infusion should be established and maintained throughout the regional anesthetic.</td>
</tr>
<tr>
<td>5. The parturient's vital signs and fetal heart rate should be monitored.</td>
</tr>
<tr>
<td>6. Regional anesthesia for cesarean section requires that the Standards for Basic Anesthetic Monitoring be applied and that the obstetrician be immediately available.</td>
</tr>
<tr>
<td>7. Qualified personnel, other than the attending anesthesiologist, should be immediately available for newborn resuscitation.</td>
</tr>
<tr>
<td>8. The anesthesia care provider should remain readily available during the regional anesthetic to manage anesthetic complications until the post anesthesia condition is stable.</td>
</tr>
<tr>
<td>9. The Standards for Post Anesthesia Care should be applied.</td>
</tr>
<tr>
<td>10. A physician should be available to manage complications and provide CPR for patients receiving post anesthesia care.</td>
</tr>
</tbody>
</table>

<sup>a</sup>Adapted from the guidelines approved by the ASA House of Delegates on October 12, 1988 and last amended on October 18, 2000.
Technique for labour epidural analgesia

- Sitting position
- Sterile prep and drape, any interspace between L₂ and S₁
- LOR for identification of epidural space, cephaled-directed bevel
- Midline approach
- Once the epidural space is identified, insert a multiport epidural catheter 5-6 cm
- If aspiration is negative, test catheter for IT or IV placement
Epidural kit
Patient positioning, prep and drape, skin infiltration
LOR technique for identification of epidural space
Choices of Local Anesthetics Drugs and Opioids for Labor Epidural Analgesia

- Catheter position testing
  - Lidocaine 2% -3-4ml

- Loading dose/bolus technique
  - 0.25% Levobupivacaine/Bupivacaine – 5-10 ml + Fentanyl 5μg/ml (Sufentanyl 0.5 μg/ml) (condition: VAS score < 3)
Labour Epidural Analgesia

- Continuous infusion
  - Levobupivacaine/ Bupivacaine – 0.125%; + Fentanyl 1.5 μg/ml- 8-15 ml/hr (condition: VAS score < 3)

- PCEA: Levobupivacaine 0.125% + Fentanyl 1.25 μg/ml
  - basal infusion rate- 8ml/h
  - Bolus dose 5ml/h
  - Lock out interval 15min
Combined Spinal Epidural Analgesia

- Single space technique ("needle trough needle")
- Spinal injectate:
  - Levobupivacaine 2.5 mg (0.5ml of 0.5% Levob)
  - Fentanyl 25µg (0.5ml)
- Start infusion: 0.1 % levobupiv. + Fent 2µg/ml
- PCEA:
  - Basal infusion: 6-8 ml/h
  - Bolus: 5 ml every 15 min
  - Lockout: 15 min
  - Hourly limit: 20 ml
Single shot spinal analgesia

Indications:
- Multiparous with dilatation >6 cm
- Primiparous with dilatation > 8 cm

Spinal needle:
- “27 G pencil point”

Spinal injectate:
- Levobupivacaine 2.5 mg (0.5% plain)
- Fentanyl 25µg
Spinal anesthesia for Cesarean section

- Small pencil point needle 27 G
- Bupivacaine 0.5% (plain is only one available) 1.6-2.2ml +20 µg Fentanyl +0.3 ml of 40% Glucose
- Sitting position
- Co-load of 500-1000 ml of crystalloid
- Left lateral tilt of 15 degrees to minimise aortocaval compression
- Ephedrine or Phenylephrine is available for hypotension treatment
Dosing scheme of bupivacaine according to the weight and height of the parturient

<table>
<thead>
<tr>
<th>Weight (kg)</th>
<th>Height (cm)</th>
</tr>
</thead>
<tbody>
<tr>
<td>50</td>
<td>1.5 1.7 1.8 1.9</td>
</tr>
<tr>
<td>55</td>
<td>1.5 1.6 1.8 1.9 2.0</td>
</tr>
<tr>
<td>60</td>
<td>1.4 1.6 1.7 1.8 2.0 2.1</td>
</tr>
<tr>
<td>65</td>
<td>1.4 1.5 1.7 1.8 1.9 2.1 2.2</td>
</tr>
<tr>
<td>70</td>
<td>1.3 1.5 1.6 1.8 1.9 2.0 2.2 2.3</td>
</tr>
<tr>
<td>75</td>
<td>1.4 1.5 1.7 1.8 1.9 2.0 2.1 2.3 2.4</td>
</tr>
<tr>
<td>80</td>
<td>1.4 1.5 1.7 1.8 2.0 2.1 2.2 2.3</td>
</tr>
<tr>
<td>85</td>
<td>1.4 1.6 1.8 1.9 2.1 2.2 2.3</td>
</tr>
<tr>
<td>90</td>
<td>1.4 1.6 1.7 1.9 2.0 2.2 2.3</td>
</tr>
<tr>
<td>95</td>
<td>1.5 1.7 1.8 2.0 2.1 2.3</td>
</tr>
<tr>
<td>100</td>
<td>1.5 1.7 1.8 1.9 2.1 2.2</td>
</tr>
<tr>
<td>105</td>
<td>1.6 1.7 1.9 2.0 2.2</td>
</tr>
<tr>
<td>110</td>
<td>1.7 1.8 2.0 2.2</td>
</tr>
</tbody>
</table>

0.4-0.5 ml of Fentanyl is usually added to hyperbaric bupivacaine
## University Hospital Rijeka
*(In 2001 labour epidural analgesia is in the routine use)*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Delivery number</th>
<th>Epidural analgesia</th>
<th>Cesarean Section</th>
<th>Cesarean Section (%)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N (%)</td>
<td>General anaest.</td>
<td>Regional/spinal</td>
</tr>
<tr>
<td>2002</td>
<td>2634</td>
<td>450 (18)</td>
<td>287 (10.1)</td>
<td>128</td>
</tr>
<tr>
<td>2003</td>
<td>2760</td>
<td>496 (18)</td>
<td>275 (9.9)</td>
<td>105</td>
</tr>
<tr>
<td>2004</td>
<td>2827</td>
<td>507 (18.2)</td>
<td>272 (9.8)</td>
<td>99</td>
</tr>
<tr>
<td>2005</td>
<td>1930</td>
<td>386 (21)</td>
<td>225 (11.6)</td>
<td>80</td>
</tr>
</tbody>
</table>

(1.1.-31.8.)

(%)
## University Hospital Split
*(epidural labour analgesia started in 2003)*

<table>
<thead>
<tr>
<th>YEAR</th>
<th>Delivery number</th>
<th>Epidural analgesia</th>
<th>Cesarean Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N (%)</td>
<td>General anaest.</td>
</tr>
<tr>
<td>2002</td>
<td>4006</td>
<td>0</td>
<td>530 (13.2)</td>
</tr>
<tr>
<td>2003</td>
<td>3918</td>
<td>10</td>
<td>635 (16.2)</td>
</tr>
<tr>
<td>2004</td>
<td>4267</td>
<td>41 (.9)</td>
<td>607 (14.2)</td>
</tr>
<tr>
<td>2005</td>
<td>4310</td>
<td>154 (1.3)</td>
<td>627 (14.5)</td>
</tr>
<tr>
<td>2006</td>
<td>4329</td>
<td>194 (4.8)</td>
<td>615 (14.2)</td>
</tr>
</tbody>
</table>

*(%)*
2010-New building of Department of Obstetrics and Gynecology
The first labour with epidural analgesia in new building
CS performed in spinal anaesthesia
Regional analgesia and anaesthesia in Croatian Obstetrics in 2011.

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Delivery number</th>
<th>Labour Epidural analgesia</th>
<th>Cesarean Section</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td>N (%)</td>
<td>General anaesthesia</td>
</tr>
<tr>
<td>PETROVA*</td>
<td>4266</td>
<td>985 (23)</td>
<td>1126 (26.4)</td>
</tr>
<tr>
<td>SVETI DUH*</td>
<td>3185</td>
<td>898 (28.2)</td>
<td>627 (19.6)</td>
</tr>
<tr>
<td>RIJEKA*</td>
<td>3053</td>
<td>641 (21)</td>
<td>341 (11.4)</td>
</tr>
<tr>
<td>SPLIT**</td>
<td>4991</td>
<td>198 (4)</td>
<td>881 (17.6)</td>
</tr>
<tr>
<td>PULA**</td>
<td>1410</td>
<td>153 (10.8)</td>
<td>246 (17.4)</td>
</tr>
<tr>
<td>ZADAR**</td>
<td>1679</td>
<td>164 (9.8)</td>
<td>261 (15.5)</td>
</tr>
</tbody>
</table>

* hospitals with long standing LEA services, ** hospitals with short standing LEA services (after 2005)
## Regional anaesthesia in Croatian Obstetrics 2012

<table>
<thead>
<tr>
<th>Hospital</th>
<th>Delivery number</th>
<th>Vaginal delivery</th>
<th>Labour epidural analgesia</th>
<th>Cesarean delivery</th>
</tr>
</thead>
<tbody>
<tr>
<td>ZAGREB MERKUR</td>
<td>1540</td>
<td>1224</td>
<td><strong>286 (23.4)</strong></td>
<td>No: 316, General: 236 (74.7), Regional/spinal: 80 (25.3)</td>
</tr>
<tr>
<td>SPLIT</td>
<td>4720</td>
<td>3764</td>
<td><strong>208 (5.5)</strong></td>
<td>No: 956 (22.25), General: 560 (58.6), Regional/spinal: 396 (41.4)</td>
</tr>
<tr>
<td>SISAK</td>
<td>1021</td>
<td>792</td>
<td>0</td>
<td>No: 229 (22.4), General: 24 (10.4), Regional/spinal: 205 (89.5)</td>
</tr>
<tr>
<td>OSIJEK</td>
<td>2513</td>
<td>1878</td>
<td><strong>22 (1)</strong></td>
<td>No: 635 (25.3), General: 482 (76), Regional/spinal: 153 (24)</td>
</tr>
<tr>
<td>ZADAR</td>
<td>1752</td>
<td>1474</td>
<td><strong>219 (14.8)</strong></td>
<td>No: 278 (15.86), General: 245 (88.1), Regional/spinal: 33 (11.9)</td>
</tr>
<tr>
<td>DUBROVNIK</td>
<td>1094</td>
<td>882</td>
<td>6</td>
<td>No: 212 (19.4), General: 59 (28), Regional/spinal: 153 (72)</td>
</tr>
<tr>
<td>ČAKOVEC</td>
<td>1077</td>
<td>894</td>
<td>4</td>
<td>No: 183 (17), General: 130 (71), Regional/spinal: 53 (29)</td>
</tr>
<tr>
<td>Šibenik</td>
<td>665</td>
<td>518</td>
<td><strong>24 (4.6)</strong></td>
<td>No: 147 (22.1), General: 110 (74.8), Regional/spinal: 37 (25)</td>
</tr>
</tbody>
</table>
What and where is the main cause for low rate of epidural analgesia in UHS?

- shortage of anaesthesiologist in delivery department
- shortage of obstetricians in delivery department
- shortage of midwifes in delivery department
New building

- Number of operating theaters in the new building:
  - 2 ORs-for elective gynecological procedures
  - 1 OR for elective and emergency CS
  - 1 OR for outpatient surgical procedures
  - Emergencies and epidural analgesia in delivery department

- Number of available anaesthesiologists
  - 2 specialist +1 resident
Duties of one attending anaesthesiologist

- Elective CSs
- Emergency CSs
- Outpatient (ambulatory) surgery
- Delivery department
- = 4 jobs simultaneously
- On the two different floors
- In the most cases there is no available anaesthesiologist for epidural analgesia till 3pm.
- Women's needs for epidural analgesia are at the bottom of the priority list.
In spite of all, my grandson and many others babies were born with epidural analgesia.
How to improve labour analgesia and anaesthesia

- Communication
- Cooperation
- Team work
- etc

The Best Possible Outcomes for All
The End