Epidural Analgesia in Labor – Whats's New

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Selective neural blockade has many clinical applications in medicine but nowhere has its use been so well accepted than in the field of Obstetrics.

Patient education and knowledge is continuing to increase its demand with the understanding that the stresses of childbirth can be minimized for not only the mother but for the neonate as well.

Effective relief of "*The Pain*" and suffering with neural blockade without the undesirable central effects of systemic analgesics, has no parallel in modern medicine.

Maternal Physiologic changes significant to the practice of regional anesthesia

Stress responses
Increased autonomic activity
Increased Oxygen consumption
Increased Adrenal cortical and other secretion of hormones
Increased endorphin levels
Can lead to:
Impairment of uterine activity
Fetal acidosis
Increase blood pressure
Increased demands of the heart
Hyperventilation

How to try to prevent them?

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Epidural Analgesia

1st stage labor: Gradual dilatation of the lower uterine segment and the cervix. It is a visceral pain → thought the sympathetic plexuses in the pelvic and hypogastric plexuses, the lumbar sympathetic chain, and hence onto the T11-12 spinal segments.

Uterine contractions at this stage → sometimes severe LBP, must common with occipitoposterior presentations.

2nd stage labor: Pelvic floor stage

Distention of the lower part of the vagina, stretching of the perineal tissues → **Intense pain!!!**

Carrier: Pudendal nerves to the S2 – S4 segments.
Genitofemoral nerve to the L1-L2 segments.

Anatomy

The epidural space extendes from the foramen magnum to the sacrococcygeal membrane.

Adipose tissue, lymphatics and blood vessels, particulary rich in venous plexi.

No free fluid!!!

Loss of resistance technique with a 16-18 Gauge „Tuohy" needle in a midline or paramedian approach

The epidural space lies within the spinal canal, outside the spinal dura mater.

Local anesthetics injected into the epidural space will spread both up and down the spinal canal, blocking the spinal nerves as they run from the spinal cord to their respective intervertebral foramina.

In epidural anesthesia the local anesthetic must spread by volume displacement.

Vertebras: 7 cervical, 12 thoracic, 5 lumbar and 5 sacral

To reach the epidural space the needle must pass: supraspinous ligament, infraspinous ligament and ligamentum flavum.

Dermatomes:

Lower abdomen T 8-9
Perineum S 1
Bladder T 10

Local Anesthetics

Lidocain: Amide of *intermediate* duration of action.

Bupivacaine: (Marcaine)

Amide of *long* duration of action. *Enjoyed a special place in obstetrics.*

The onset of analgesia during labor is reasonably fast.
The duration is sufficiently long.
The degree of motor block is less with the use of lower concentrations which provides satisfactory analgesia during labor.
Appears to have minimal effects on the fetus.

Disvantages for surgical delivery:

The onset of anesthesia is slow
The duration is too long

When accidentally administered in large doses intravasculary, profund and prolonged systemic toxicity has resulted in several cases of cardiac arrest that has proven refractory to resuscitation.

But, if we use it carefully, Bupivacaine is the best local anesthetic for analgesia during labor.

Ropivacaine (Narop-Naropine)

Newer amide local anesthetic similar in structure, potency and pharmacodynamics to Bupivacaine

Less cardiotoxic than Bupivacaine in pregnant patients may be a greater margin of safety with Ropivacaine than with Bupivacaine, if accidentally injected intravenously.

Reduce blockade of motor fibers

Opioids (Fentanyl)

Narcotic receptors in the dorsal horn of the spinal cord

↓

Opiates

↓

Selective analgesia without sympathetic sensory or motor blockade

Ideal conditions of analgesia during labor

Advantages

Analgesia with minimal sensory anesthesia and no motor weakness in lower limbs.
Awareness of uterine contractions.
Minimal use of local anesthetics and narcotics over a given period of time.
Reduced risks if drugs are infused into the intravascular compartment.
Reduced incidence of cesarean and vacuum deliveries if analgesia is continued during the 2nd stage.

Continuous Lumbar Epidural Analgesia

Provides analgesia and anesthesia.

Can be extended for many hours to meet the varying duration of labor.

Can be extended to provide ideal conditions for cesarean delivery.

Provides an avenue to extend analgesia into the postoperative period.

Produces maternal cardiovascular side effects that are predictable and easily manageable.

Does not slow the progress of labor

No adverse effects in the fetus

Contraindications

Acute maternal hemorrhage

Bleeding disorders

Maternal infection (localized infection)

Tattoos

Timing of induction of Epidural Analgesia- Active labor

Magnitude of contractions: 40 – 7mmHg

Frequent: 3-5 minutes

Sufficient duration: 40-50"

Pain

Cervical dilation need not be to fixed point

Site of placement

L2-3 interspace in a cephalic direction

Technique

The following measures must be taken prior to inducing epidural analgesia:

Resuscitative equipment

IV infusion must be in place

Fetal well being should be checked

Maternal baseline pulse and blood pressure should be obtained

A perinatal nurse should be in the room

Procedure

Proper patient positioning (lateral or sitting position)

L2-3 is identified

1000 cc Hartmann's sc. IV before procedure

Sterile conditions

Skin to epidural space: 2.5-5 cm

The bevel of epidural needle in cephalic direction

Epidural catheter: length 3-4 cm

Aspiration before injection

Test dose

Pain relief within 8-10 minutes

Check blood pressure:

Every 2-3 minutes for the first 10 minutes, 3-4 minutes for the next 10 minutes and 10-15 minutes thereafter.

Maintain continuous syringe pump treatment.

If blood pressure falls more than 20% bellow baseline: IV Ephedrine or Phenylephrine titration.

The degree of pain relief, sensory anesthesia and motor block should be assessed every 30 minutes.

Complications

Misplacement of needle or catheter (no nerve block)

Dural tap

Spinal headache → perform a blood patch

Intravenous placement

Hypotension

Total spinal anesthesia

Acute generalized toxicity

Neurological damage

Headache

Labor Analgesia Service – Joseftal Hospital Eilat- Israel

24 hours service.

In 2008: 4737 deliveries

28.49 % Cesarean deliveries

Regional anesthesia for cesarean delivery: 97%

General anesthesia for cesarean delivery: 3%

Reasons for general anesthesia in Cesarean delivery: Patient refused, regional anesthesia contraindicated, very urgent cesarean delivery (prolaps of cord)

In 2008: 71.62% Epidural analgesia for deliveries

3 patients with post dural headache syndrome:

1 was treated with repose and oral analgesics

2 was treated with blood patch and go home after 24 hours of the procedure.

Bolus after epidural perform: Bupivacaine 0.25% 7cc + Fentanyl 0.05 mg

Continuous syringe pump:

8-10 cc per hour. Bupivacaine 0.125 % + Fentanyl 0.05 mg.,

Minimum time of anesthetist on site: 30 minutes after perform

So what's new: Ropivacaine, Walking epidural analgesia,

Combined spinal epidural analgesia, Birth with dolphins??? , Water birth.