MATERNAL RISK FROM LOCAL AND REGIONAL OBSTETRIC ANESTHESIA

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Introduction

Because of an experience of over 30 years the complications for local and regional obstetric anesthesia are well known. It is important to be aware of them in order to inform mothers appropriately and to weigh the risks and benefits when choosing a method of anesthesia during birth and for a possible Cesarean section.

We will discuss the vaginal methods of pudendal and paracervical block as well as the methods of spinal conduction anesthesias (spinal anesthesia, lumbar epidural anesthesia and caudal anesthesia).

1. Pudendal Block

   Pudendal block is a relatively safe procedure. The only contra-indication is an allergy against the anesthetic itself. Very rarely systemic reactions with inadvertent intravascular injections have been noted (Table 1). There are no special comments regarding complications when informing the patient.

2. Paracervical Block

   The principal complication of paracervical block are to the fetus (fetal bradycardia, acidosis, decreased placental perfusion, hypertonic uterus, neonatal convulsion).

   Maternal complications (Table 2) are primarily in the form of systemic reactions from inadvertent intravascular injections in spite of attempted aspiration. In order to avoid maternal complications, it is recommended to inject the anesthestic directly under the vaginal epidermis; e.g., not to insert the tipe of the cannula deeper than 2-3 mm. This decreases the possiblity of an injection into a uterine vessel.

   Less hazardous complications are a superficial laceration of the vagina, hemorrhage from the injection site, and very rarely a para-metrial hematoma.

   The mother must be informed accordingly because ven in the hands of an experienced obstetrician, an intravascular injection with a systemic reaction may occur.

3. Spinal Anesthesia

   Spinal anesthesia for vaginal deliveries with blocks to T10 and for a Cesarean section with blocks to T6 - T7 has a variable complication rate (Table 3). Predominating is a hypotension with a variable severity the extent of which depends on the number of blocked segments and the measures taken such as volume replacement and vascoconstrictors. Infection, anticoagulation treatment and history of severe headaches are contraindications.

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Anesthesiologists have pointed out as an important contraindication the inexperience of the physician. While technically the lumbar puncture is simple, the method requires knowledge and experience in the treatment of cardiovascular derangements. Neurologic damage in the hands of experienced individuals is extremely rare. Only 4-5% of the cases will have headaches if a 25 gauge needle is used.

Spinal anesthesia is used infrequently in Germany but commonly in the english speaking countries for emergency surgical vaginal or Cesarean deliveries. It will be difficult to inform the patient properly in this situation. If the methods are discussed during pregnancy, headaches and cardiovascular complications should be mentioned as complications.

4. Lumbar Epidural Anesthesia

4.1 The main complication of the single injection technique is the unrecognized perforation of the dura and subsequent intrathecal injection of the anesthestic with a consequence of total spinal anesthesia blocking, thoracic, and cervical segements with circulatory collapse and respiratory paralysis. Systemic reactions are more commonly seen than with catheter anesthesia.

Even in skilled hands a part or all of the dose may be injected intrathecally unknown to the physician. Thus, the single shot method has been abandoned by many obstetricians and most anesthesiologists.

4.2 Circulatory collapse or respiratory paralysis as complications of catheter peridural anesthesia have been largely eliminated by applying a test dose with a waiting time of 5-10 minutes. Systemic reactions to the local anesthesia are correspondingly lower with the lower dose.

The anesthesia can be controlled. An important complication is the perforation of the dura in 1-2% with subsequent headaches. This common occurrence is related to the caliber of the cannula.

Neurological complications and infections are extremely rare.

When informing a mother it should be pointed out that even for skilled individuals the risk of dura perforation with headaches is 1-2%.

5. Caudal Anesthesia

5.1 For the single shot method the complications are comparatively frequent toxic reactions as well as cardiovascular disturbances depending on dose and number of affected segments (Table 5). Intrathecal injections occur very rarely and similarily, the risk of "total spinal anesthesia" is rare.

5.2 Complications with catheter technique are less because of the intermittent injections which allow lower single doses and thus reduce the risk of toxic reactions. In comparison to catheter peridural anesthesia the required dose for overcoming labor pain during the first stage is higher. Perforation of the dura are extremely rare (Table 5).

Table 1

Severe toxic reaction	not seen
Local infections	0.08%
Reversible block of sciatic nerve	5.0%

Frequency of maternal complications in pudendal anesthesia (11)

Table 2

Severe toxic reactions	0.03%
Mild toxic reactions	0.2%
Injury to the vagina	0.1%
Hemorrhage at the injection site	1.0%
Parametral hematoma	0.03%

Frequency of maternal complications with cervical block (1,11)

Table 3

I. Immediate complications

Hypotension (dependent on prophylactic measures and the number of blocked segments)

a) vaginal delivery (up to T10)	3-10%
b) Cesarean section (up to T6)	30-80%
Shivering	1.7%
Nausea	0.3%
Respiratory paralysis	0.1%

II. Late complications

CNS damage	--
Headache	3.5%
Backache	2.7%

Frequency of maternal complications with spinal anesthesia (3,4,13,14,15)

FREQUENCY OF MATERNAL COMPLICATIONS WITH PERIDURAL ANESTHESIA

	Hellmann(9) 1965 N=26167 Single-Shot	Crawford(6) 1979 N=15000 Catheter	Women's Hospital University of Düsseldorf(16) N=2171 Catheter
Total spinal anesthesia	0.04%	--	--
Severe toxic reactions	0.06%	--	--
Infections	--	--	--
Epidural hematoma	--	--	--
Perforation of dura	--	2%	1%
Blood aspiration	--	--	4%
Hypotension	1.3%	1%	9%

FREQUENCY OF MATERNAL COMPLICATIONS WITH CAUDAL ANESTHESIA

	Busch(5) 1959	Dawkins(7) 1969	Abouleish(1) 1977		Diederich(8)
	Catheter N=27876	Literature Review	single-shot N=611	catheter N=731	single-shot 2824
Hypotension	< 90mmHg 10%	< 80mmHg 6.3%	> 20% drop in blood pressure 3.6%	2.8%	> 20 mmHg 2.2%
Toxic reaction	Ø	0.2	0.16	0.13	0.1
Infection	-	0.2	Ø	Ø	-
Spinal Anesthesia	0.3	0.1	Ø	0.13	Ø
Caudal Anesthesia failed	5.6	3.1	Ø	-	6.3
Pains at the Injection site	5.6	7.6	-	-	-
Bladder retention (over 100ml residual urine on day 2)	5%	-	-	-	-

Ø Not observed

\- No data

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