ANAESTHETIC TECHNIQUES DURING PREGNANCY. A CASE REPORT AND REVIEW OF THE LITERATURE.

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ABSTRACT

Anaesthetic techniques during pregnancy. A case report and review of the literature

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As general anaesthesia administered during the first two trimesters of pregnancy for gynaecological procedures was associated with a high incidence of miscarriage and exposes the fetus to teratogenic effects of drugs, a case of successful breast tumour extraction under thoracic paravertebral block is reported with review of the literature.

Anaesthesia and surgery during pregnancy are related to a degree of psychological and physiologic stress that may pose a threat to the well being of the mother and the fetus. As a consequence, preterm labour or spontaneous abortion may not be avoided. In the past, general anaesthesia administered during the first two trimesters of pregnancy for gynaecological procedures was associated with a high incidence of miscarriage [1]. Furthermore, general anaesthesia exposes the fetus to teratogenic effects of drugs. The severity depends on the dose of the drug and the stage of development and the genetic susceptibility of the fetus [2]. Suggested as an alternative, the application of locoregional anaesthetic techniques is considered to have less if any risks on fetal development and neonatal outcome [3]. We report a case of surgical excision of a breast tumour with axillary lymph node dissection in a pregnant woman under thoracic paravertebral blockade (TPVB) and we discuss the literature.

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Case report

A 26-yr-old primigravida at 20 wk gestation was admitted to the hospital with a 2.3 cm tumor of the left breast with non-palpable axillary nodes. Needle biopsy performed four days prior showed an infiltrating ductal adenocarcinoma requiring urgent excision. Her past medical history was unremarkable and pregnancy was uncomplicated. Preoperative visit revealed a gravid female, BMI 20.4 kg/m^2, with heart rate of 75 beats per minute, arterial blood pressure 100/70 mmHg and normal physical examination. Routine preoperative laboratory testing was within normal. Obstetrical consultation had confirmed the woman's gestational stage and monitoring of uterine activity and fetal heart rate confirmed the well being of the fetus (heart rate 147 bpm with good beat to beat variability). After discussing the anaesthetic op-

tions with the patient, thoracic paravertebral blockade (TPVB) plus conscious sedation was decided.

Next morning, the patient was brought to the operating room having nil by mouth after midnight. Monitoring was established, consisting of continuous electrocardiography, noninvasive blood pressure measurement, and pulse oximetry. Supplemental oxygen via face mask was given. Intravenous access was obtained, ranitidine 50 mg, midazolam 1 mg and fentanyl 50 μg were administered and an infusion of Ringer's lactate commenced. With the patient in sitting position, left TPVB was performed at T_{1-7} levels with a spinal Yale needle 22 G – 3.5 inch, by injecting 5 ml of 0,5% ropivacaine at each level, using the technique described by Greengrass and Steele [4]. Following TPVB, she was placed in the supine position with a left lateral tilt and an ipsilateral superficial cervical nerve block was performed using 0.5% ropivacaine 4 ml. A few minutes later the sensory block of the appropriate dermatomes was confirmed by loss of sensation to cold and pinprick. A low dose infusion of propofol (25 $\mu g*kg^{-1}*min^{-1}$) was commenced. During the operation the patient remained comfortable and communicative. No anaesthetic complications or side effects including nausea or vomiting were noted. A wide excision of the tumor with ipsilateral two level lymph node dissections was carried out. She tolerated the 65 minute procedure very well and her vital signs remained stable throughout.

Morphine PCA and paracetamol were used for postoperative analgesia. The total analgesic requirement was morphine 12 mg and paracetamol 5 g for the first 48 h. Postoperative obstetrical monitoring confirmed the well being of the fetus (135 bpm). The patient was discharged on the third postoperative day in good condition. At 34 weeks gestation she delivered a healthy baby boy.

Discussion

Pregnant women who undergo anaesthesia for surgical procedures not related to pregnancy are rating from 0.2 up to 2% [5,6,7]. The total number is approximately 50,000 each year in the United States [8]. Anaesthetic management is a challenge as the treatment not only should consider the patient but also any potential side effects on the fetus. Many studies have addressed the specific risks of surgery and anaesthesia during pregnancy, but there is still much undetermined. Modern anaesthesia is considered to have overcome the major problems of maternal morbidity and mortality on the pregnant patient [9]. In a ten-year period (49,567 births, 78 women for nonobstetric operation, incidence of 1/635), the perinatal mortality rate for non-obstetric operation was not increased, although preterm labor was higher [6]. The incidence of premature delivery in these patients is considered higher than among the non-surgical pregnant population [10]. Surgery during the first or second trimester is not associated with significant preterm labor, fetal loss or risk of teratogenicity, while during the third trimester is associated with preterm labor, but not fetal loss [7]. Controversy exits about the hazards of the chosen anaesthetic technique. In a study on anaesthesia related maternal deaths for non obstetric diseases, the number of deaths involving general anaesthesia had remained stable, but the number of regional anaesthesia-related deaths had decreased since 1984 [5]. Nevertheless, it is reported that patients undergoing laparotomy with regional anaesthesia for adnexal mass in pregnancy may have higher risk of preterm labor than those given general inhalational anaesthesia for laparotomy or laparoscopy [10].

Pregnant women differ from non-pregnant women in several aspects - both anatomically and physiologically, and many of these changes vary during pregnancy. Pregnant women are at risk of supine hypotension and aspiration of gastric contents and the incidence of failed intubation in parturient is 2-3% [11,12]. Furthermore, the fetus may be at risk of hypoxemia due to reduced uterine blood flow or maternal hypoxia [13]. The risk of cardiovascular or CNS fetal depression from placental crossover of anaesthetic or other agents is also present. Avoiding general anaesthesia is important because airway catastrophes remain the leading cause of anaesthesia related mortality in pregnant women [5]. Thus, and despite the existing controversy, the administration of local anae-

sthetics to pregnant women is suggested by certain studies.

Among the existing techniques for TPVB, the sitting position allows easy identification of landmarks and is comfortable for the patient. The TPV space is continuous with the epidural space medially and the intercostal space laterally. The needle is inserted 2.5-3 cm lateral to the aspect of the spinous process and advanced perpendicular to the skin to contact the transverse process of the vertebra at a depth depending on the individual, usually 2-4 cm. In this depth, bone must be encountered. This is accomplished by withdrdrawing and redirecting the needle cephalad or caudal. The needle is then advanced above the transverse superior edge for 1-1.5 cm until a loss of resistance is felt. For more details about the technique, the reader is referred to the existing excellent reviews in the literature [14].

Surgery for breast tumors is included among the common procedures for the maternal age group [12]. Surgery of the thorax, chest wall and axilla can be accomplished under general anaesthesia, high thoracic epidural anaesthesia and TPVB. Compared with general anaesthesia, patients who receive TPVB have a shorter recovery time, experience less PONV and postoperative pain, require fewer analgesics, tend to mobilize earlier with less painful restricted movement of the shoulder and are discharged significantly earlier from hospital [4,15]. Although high thoracic epidural anaesthesia is suggested as an alternative to general anaesthesia for surgery of the thorax, it may be associated with hypotension, bradycardia from bilateral sympathetic blockade and other physiologic reflexes [16]. As an alternative, TPVB provides good conditions for breast and axillary surgery, it is safe, effective, associated with minimal complications and high degree of patient satisfaction and provides long lasting postoperative analgesia after bolus injections [14]. TPVB is technically simple and easy-to-learn, is associated with a low overall incidence of complications, has few contraindications and is suitable for breast surgery [4,17]. Certain reports advocate the use of TPVB for breast surgery in pregnant women [18,19].

In conclusion, this case illustrates the need for alternatives in the anaesthetic management during pregnancy. Decisions are based on the efficacy and safeness of the technique together with an understanding of the physiologic changes of pregnancy and the impact of anaesthesia and surgery on the developing fetus.

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