

Anesthetic Techniques Used for Cesarean Section at the Royal Medical Services Hospitals in 2007

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ABSTRACT

Objective: To describe the different anesthetic techniques used for cesarean section at the Royal Medical Services Hospitals.

Methods: We retrospectively reviewed the anesthetic techniques used for Cesarean sections performed between 1st of January to the 31st of December 2007 at Royal Medical Services Hospitals. Data collection aimed at anesthetic techniques used for scheduled and non-scheduled Cesarean sections.

Results: Out of a total of 5,314 Cesarean sections performed in the year 2007 at our institution, 81.6% were performed under general anesthesia, 18.3% under spinal anesthesia, and 0.1% under epidural anesthesia. General anesthesia still predominated in our hospitals, the percentage of general anesthesia performed by different hospitals varied from 41% to 96%.

Conclusion: This review of anesthetic techniques used for Cesarean section shows an overuse of general anesthesia and low use of regional anesthesia. There is a need to adjust clinical practice at the Royal Medical Services Hospitals in accordance with recent scientific data.

Key words: Cesarean section, Clinical practice, General anesthesia, Regional anesthesia, Standards

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Introduction

The choice of anesthesia for Cesarean section may depend on several factors including perioperative morbidity and mortality, patient and surgeon preferences, feasibility of the technique in a given patient, effects on intraoperative and postoperative pain control, effects on early recovery and monitoring requirements as well as costs.⁽¹⁻⁴⁾ Anesthetic practice for Cesarean section has changed during the last decades world-wide with a remarkable shift in favor of regional anesthesia, most often spinal anesthesia in Western Europe and the United States of America, since it has lower

maternal morbidity and mortality rates.⁽²⁻⁸⁾ Reference values for the practice of obstetric anesthesia at the Royal Medical Services Hospitals have not been determined yet. This investigation was performed to obtain data on anesthetic techniques used for Cesarean section so as to evaluate current anesthetic practices adopted, in relation to international standards of obstetric anesthesia.

Methods

After ethical committee approval, a phone call request was done to all anesthesia units at the Royal

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Medical Services Hospitals to collect retrospective data on anesthetic techniques used for Cesarean section between the 1st of January to the 31st of December 2007. All units sent the data obtained from operating room logbooks. Data collection aimed at anesthetic techniques used for scheduled and non-scheduled Cesarean sections only.

In our institution, anesthetic options for Cesarean section include general anesthesia, spinal anesthesia or epidural anesthesia. A standard general anesthesia technique would comprise pre-oxygenation 3-5 minutes, followed by the administration of Sodium thiopental (3-5mg/kg) or Propofol (2-3mg/kg) and Succinylcholine (1-2mg/kg) for rapid sequence induction.

After orotracheal intubation with cricoid pressure, a non-depolarizing neuromuscular blocking agent such as Atracurium (0.5mg/kg) or Vecuronium (0.1mg/kg) or Pancuronium (0.1mg/kg) is administered. Anesthesia is maintained with Halothane or Isoflurane in a mixture of 50% nitrous oxide in oxygen. Opioid analgesics are routinely given after delivery of the baby. Single-shot spinal anesthesia is performed using 0.5% hyperbaric Bupivacaine 8-13mg and with or without intrathecal Fentanyl 10-25µg via a 25 or 27 gauge Whitacre or Quincke spinal needle. For epidural anesthesia, 0.5% plain Bupivacaine 10-15ml that could be supplemented with epidural boluses of 0.5% plain Bupivacaine 3-5ml when necessary is used.

Ultimately, the choice of anesthesia is determined by patient factors, surgical conditions and the preference of the individual anesthetist.

Results

Out of total 5,314 Cesarean Sections performed in the year 2007 at our hospitals, 81.6% were performed under general anesthesia, 18.3% under spinal anesthesia and 0.1% under epidural anesthesia. No failed spinal anesthesia was reported (see Table I). General anesthesia still predominated in our hospitals, the percentage of general anesthesia performed by different hospitals varied from 41.4% which was at Prince Hashem hospital to 96.2% at Prince Ali hospital. Spinal anesthesia performed by different hospitals varied from 58.4% at Prince Hashem hospital to 3.3 % at Prince Ali hospital. Epidural anesthesia was rarely performed.

Discussion

General anesthesia has the advantage of having no

absolute contraindications because of a large variety of intravenous and inhalational agents, and remains the method of choice in some conditions.^(2,3,8) These include severe fetal distress, maternal hypovolemia, coagulopathy, acute diseases of the spine and its contents, increased intracranial pressure, failure of regional anesthesia and patient refusal of regional anesthesia.^(3,9) Increased incidence of pulmonary aspiration of gastric contents and failed endotracheal intubation (incidence is 1:238) are the two major causes of maternal morbidity and mortality associated with general anesthesia.^(2,9-11) Of course, maternal changes as the result of such outcomes as hypoxia and hypotension affect the outcome of the fetus.⁽²⁾ Use of halogenated volatile agents may be associated with a greater risk of maternal blood loss.^(11,12)

Regional anesthesia is a more recent development avoiding the major complications of general anesthesia but having several of its own.⁽³⁾ These include maternal hypotension, accidental total spinal anesthesia, urinary retention, post-partum headache and epidural abscess or hematoma.^(2,3,9) Spinal anesthesia has become the preferred technique since it is easy to perform, inexpensive, safe and has a high level of patient satisfaction.^(3,4,6) By adding opioids to spinal anesthesia, a reduction in local anesthetic dose is possible. Reports on low-dose spinal anesthesia suggest that this may reduce maternal hypotension.⁽¹³⁾ Improved needle design has reduced the incidence of postdural puncture headache and accounts for the increased popularity of spinal anesthesia.^(3,14)

Our study reviewing anesthetic techniques used for 5,314 elective and nonelective Cesarean sections performed at our hospitals during the year 2007 revealed that the majority (81.6%) were performed under general anesthesia, around a fifth (18.3%) were performed under spinal anesthesia, and only 0.1% were performed under epidural anesthesia. This analysis was based on a retrospective review of operating room logbooks and has limitations, including the lack of some key maternal and perinatal variables (parity, age, elective or nonelective, and 5-minute Apgar scores).

In the United States of America, the use of regional anesthesia increased from 51% to 85%, between 1981 and 1992, a period of 11 years. In 2001, 95% of elective and 70% of nonelective Cesarean sections were performed under regional anesthesia.⁽¹⁵⁾

Table I. Anesthetic techniques used for cesarean section in the RMS hospitals in 2007

Hospital	Cesarean section	General Anesthesia	Spinal Anesthesia	Epidural Anesthesia
Prince Zaid	353	289 (81.86%)	64 (18.14%)	0
Prince Ali	780	750 (96.16%)	26 (3.33%)	4 (0.51%)
Prince Rashed	1410	1324 (93.90%)	86 (6.10%)	0
Princess Haya	346	324 (93.64%)	22 (6.36%)	0
Prince Hashem	640	265 (41.41%)	374 (58.44%)	1 (0.15%)
Queen Alia	1400	1050 (75%)	350 (25%)	0
King Hussein	385	335 (87%)	50 (13%)	0
Total number	5314	4337 (81.6%)	972 (18.3%)	5 (0.1%)

Data are presented as numbers

In Germany, in 1978, 94% of all operative deliveries were being done under general anesthesia, which decreased to 61% for elective cases in 1996. However, 83% of urgent cases and 98% of emergency cases were still being done under general anesthesia.⁽¹⁶⁾

The 2002 re-evaluation indicated that the rate of regional anesthesia for elective Cesarean section had increased to 73.5% from a value of 39% six years previously, Spinal anesthesia became the preferred technique and was performed in 50%, 35% and 5% of the patients presenting for elective, urgent and emergency caesarean delivery, respectively.⁽⁵⁾ The use of general anesthesia for cesarean section in the United Kingdom has also declined, falling from 77% in 1982 to 44% by 1992.⁽¹⁷⁾ In 1997, of all caesarean sections 22% were completed with general anesthesia, 47% with spinal, 22% with epidural, and 9% with combined spinal-epidural anesthesia.⁽⁶⁾ In parts of the United Kingdom, use of regional anesthesia has reached nearly 95% as of 2002.⁽¹⁸⁾

A successful and rapid change of anesthetic practice for Cesarean sections at our institution is needed to be in line with global standards. This may be implemented through the (a) implementation of an antenatal education program explaining anesthetic choices and expectations so that expectant mothers may start preferring regional anesthesia; (b) creating a dedicated obstetric anesthesia team to care for laboring patients which can provide epidural analgesia for normal deliveries and use epidurals in case of urgent or emergency Cesarean section if needed; (c) encouraging a change in the culture of operation room team who mainly prefer general anesthesia as it takes less time than regional anesthesia to set up. Further work needs to be done to change the behavior of surgical, nursing and anesthetic staff; and (d) taking the decision to have change through application of international obstetric anesthetic protocols and guidelines.

Some of these steps are being implemented at Prince Hashem Hospital and this explains the higher rate of Cesarean sections done under spinal anesthesia in comparison with other hospitals in our institution.

Conclusion

This review of anesthetic techniques used for Cesarean section shows an overuse of general anesthesia and a low use of regional anesthesia, calling for an adjustment of clinical practice in accordance with recent scientific data.

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