

ORIGINAL ARTICLE

A retrospective seven years audit of mode of deliveries in a tertiary care university hospital of Turkey

Berrin Gunaydin, MD, PhD*, Kadir Kaya, MD*

**Professor of Anesthesiology*

Department of Anesthesiology, Gazi University School of Medicine, Ankara (Turkey)

Correspondence: Prof. Berrin Gunaydin, Division of Obstetric Anesthesia, Gazi University School of Medicine, Besevler 06500, Ankara (Turkey); Phone: +90 312 202 53 18; Fax: +90 312 489 21 19; E-mail: gunaydin@gazi.edu.tr

ABSTRACT

Aim: We aimed to present an audit on delivery rates and obstetric anesthesia techniques at Gazi University Hospital in Turkey over a period of seven years to compare it with national or international standards.

Materials and methods: Annual rate of different modes of deliveries (vaginal or caesarean section) and obstetric anesthesia techniques were retrospectively audited over seven years.

Results: Our audit shows a progressive rise in the rate of caesarean section (CS) from 33.72% in 2002, to 57.41% in 2008 over vaginal deliveries. There is also an increased use of regional anesthesia for CS. While the practice of epidural anesthesia for CS has decreased, utilization of CSE and spinal anesthesia has increased over 7 years.

Conclusion: We conclude that over the last 7 years, the rate of CS, spinal anesthesia for elective CS and neuraxial analgesia for labour in our unit has progressively increased.

Key words: Obstetrics; Caesarean section; Vaginal delivery; Regional techniques; Spinal analgesia; Epidural; Combined spinal epidural

Citation: Gunaydin B, Kaya K. A retrospective seven years audit of mode of deliveries in a tertiary care university hospital of Turkey. *Anaesth Pain & Intensive Care* 2013;17(1):51-54

*This paper was presented in part at the 40th Annual Meeting of SOAP held in Chicago (USA), 2008.

INTRODUCTION

The caesarean section (CS) rate has increased the world over during the previous few decades. In the United States it has exceeded 24% and anesthesia was responsible for approximately 3-12% of all maternal deaths in that country from 1979 to 1990.¹ The report on confidential enquiries of maternal deaths over 50 years (1952-2002) confirmed the remarkable decline in the anesthesia-related maternal mortality.² This decline has been attributed to the increased use of regional anesthesia, improvement in anesthetic technique and introduction of H₂ receptor antagonists. Successive reports indicated that anesthesia related maternal deaths mainly associated with general anesthesia were due to difficult intubation resulting in maternal hypoxia and/or to pulmonary aspiration of gastric contents.³ Therefore, utilization of general anesthesia for CS has progressively declined and now it is limited only to specific situations where regional anesthesia is contraindicated, refused by the mother or not appropriate to conduct because of time

factor.³

A progressive rise in the caesarean delivery rate has been observed worldwide since 1970.⁴

Therefore, the need to implement safe anesthesia techniques for operative deliveries has risen as well. While safe anesthetic practice is a norm in the developed countries, it still remains unsatisfactory in many of the developing countries. We aimed to investigate obstetric anesthesia database for rate of vaginal and caesarean deliveries, and for choice of anesthesia techniques for these deliveries in a tertiary care university hospital of Turkey in order to match it with the standards of developed countries.

METHODOLOGY

After approval of research ethics committee of Gazi University, following data were collected on deliveries carried out at Gazi University, Faculty of Medicine, Ankara (Turkey) from 1st January 2002 to 31st

December of 2008:

1. Annual rate of vaginal and caesarean deliveries
2. Anaesthesia technique (general or regional) used and type of regional anaesthesia (epidural / combined spinal epidural (CSE) or spinal).

The data were audited retrospectively and presented as number "n" or percentage (%).

RESULTS

Our audit showed a progressive rise in the rate of CS (from 2002-2006 and then decline from 2006-2008). The rates of caesarean deliveries were 33.72% (401/1189), 54.10% (652/1205), 59.70% (815/1365), 60.03% (1065/1774), 70.76% (1411/1994), 65.99% (1448/2194) and 57.41% (1490/2595) from the beginning of 2002 till the end of 2008 respectively (Figure 1).



Figure 1: Rate of delivery (caesarean or vaginal) over seven years.

There was increase in utilization of regional anaesthesia with a steady decline in general anaesthesia. Rate of regional versus general anaesthesia for caesarean deliveries were around 58/42% (231/401), 57/43% (282/652), 55/45% (449/815), 57/43% (609/1065), 76/24% (1024/1411), 89/11% (1294/1448) and 97/3% (1439/1490) from 2002 to 2008, respectively (Figure 2).

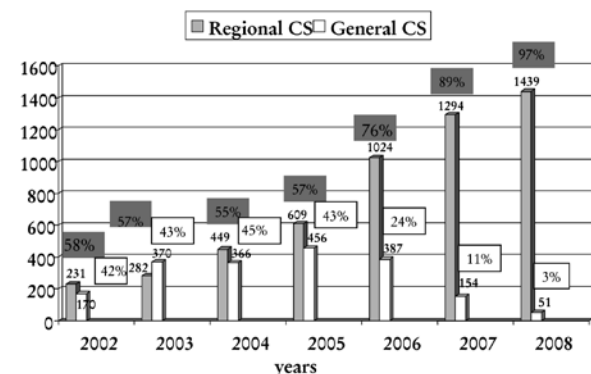


Figure 2: Choice of anaesthesia technique (regional or general) for caesarean delivery over seven years.

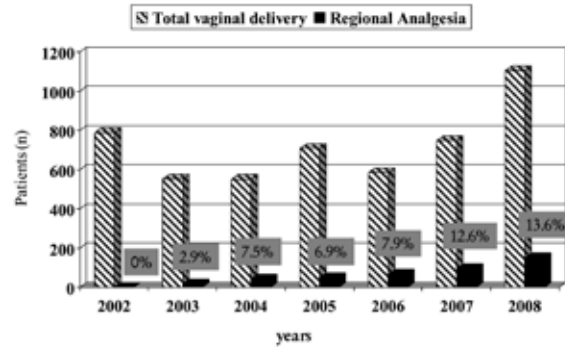


Figure 3: Rate of neuraxial labour analgesia over seven years.

Regarding the types of regional anaesthesia for CS, rates of epidural anaesthesia has declined, whereas rates of CSE and of spinal anaesthesia have risen throughout the audited years. Neuraxial analgesia for labour was started in 2003 and it reached to 13.6% in 2008 (Figure 3). During the audit period, 3 mothers died because of breast cancer which was diagnosed during pregnancy.

DISCUSSION

Our retrospective audit for a period of seven years showed a gradual increase in the rate of CS as well as in the rate of regional anaesthesia for CS compared to general anaesthesia. Although very unevenly distributed, 15% of births worldwide occur by CS. Latin America and the Caribbean show the highest rate (29.2%), and Africa shows the lowest (3.5%).³ In developed countries, the proportion of caesarean births is 21.1% whereas in least developed countries only 2% of deliveries are by CS. The analysis suggests a strong inverse association between CS rates and maternal, infant and neonatal mortality in countries with high mortality levels.³ Although, rate of vaginal deliveries has declined compared to CS rate, use of neuraxial analgesia for labour has increased. Since 2002, almost all of our uncomplicated parturients requesting regional analgesia for labour have been receiving CSE and elective CS operations have been performed under single shot spinal anaesthesia.

During the audit period at our institution, segmental epidural anaesthesia was provided with 20-25 ml of 0.5% bupivacaine with fentanyl 50 µg through epidural catheter to achieve T4 level of block for CS. The CSE was performed with 10 mg of 0.5% hyperbaric bupivacaine with 20 µg of fentanyl intrathecally followed by epidural top up boluses if necessary.⁵ Single shot spinal anaesthesia was provided with 12 mg of 0.5% hyperbaric bupivacaine with 10 µg of fentanyl and 100 µg of morphine.⁶

Neuraxial analgesia for labour was performed with

either 7 ml of 0.1% bupivacaine with 50 µg of fentanyl through the epidural catheter, or CSE with 20 µg of intrathecal fentanyl without bupivacaine. Both epidural and CSE techniques were maintained by patient controlled epidural analgesia (PCEA) including 0.1% bupivacaine with 2 µg/ml of fentanyl (5 ml bolus on demand with 10 minute lock-out).⁷

The CSE technique has been provided using intrathecal 0.5% bupivacaine 2.5 mg with fentanyl 15 µg followed by PCEA with 0.0625% bupivacaine with fentanyl 2 µg/ml, set to deliver 10 ml/h basal infusion, 5 ml bolus on demand and 10 min lock-out.⁸

The National Sentinel Caesarean Section Audit (NSCSA) reported that CS rates increased from 9% of deliveries in 1980 to 21% in 2001 with similar increase in many developed countries.⁹ The reason for this increase in CS rate in our unit is probably due to surgeons' and/or patients' preferences. The choice of anesthetic technique is a cause of concern due to the anesthesia-related deaths and the associated risks and complications associated with poor anesthesia technique.² Based on our 7-year retrospective audit, we have shown the distribution of anesthesia technique for CS in a tertiary university hospital for better understanding of changing protocols and regulations to administer safe obstetric anesthetic care.

In the past, many anesthesiologists were mainly trained in general anesthesia for CS.¹⁰ Some might have finished anesthesia training without ever seeing a CS under spinal anesthesia.¹⁰ We also used to perform more of the CS in our unit under general anesthesia. However, over the period of time, epidural anesthesia for elective caesarean deliveries became popular with the understanding and cooperation of obstetricians in our unit. Soon after its introduction in our unit, both the acceptance level and the experience of anesthesiologists and the obstetricians rose for regional techniques, including epidural anesthesia for CS, CSE and/or single shot spinal anesthesia.

Several surveys on obstetric anesthesia in USA have shown that there is a significant decline in use of

general anesthesia for CS. According to a recent report, the rate of general anesthesia for CS was 3.6% among the parturients delivered at Brigham and Women's Hospital which has an annual delivery rate of over 10,000.¹¹ In the beginning of our audit, the rate of general anesthesia for elective CS was 42.39% and it declined to 3.43% by 2008. 96.57% of the parturients had regional anesthesia for CS in 2008, where most of them received spinal anesthesia.

According to health statistics of Republic of Turkey, the number of annual births per thousand people is 1479.¹² Most of these deliveries are assisted by a physician (46.7%) or by a trained midwife/nurse (36.3%). While most of them are performed in a health institution (78.5%), home deliveries are around 21.5%.¹² There are no midwives in Gazi University hospital and almost all vaginal deliveries are always performed by trained obstetricians. Regarding anesthesia technique, we have successfully switched from general anesthesia to spinal anesthesia for elective CS over the previous seven years.

Limitations of the study: The limitation of the present study is the lack of large scale audits covering whole of the country for comparison. Only a recent national retrospective audit was conducted for a 10-year period (2000-2010) at Uludag University, Bursa (Turkey).¹³ In that survey, the rates for CS and vaginal birth were 50.1% and 49.9% respectively. The CS rate was 41.88% in 2000 but it increased to 54.12% in 2010, which was similar to our CS rate (157% in 2008).¹³ Therefore, we plan to re-audit last five years not only to improve obstetric anesthesia practice in our facility to meet worldwide standards but also to acquire fresh information for further comparison.

CONCLUSION

In conclusion, we have demonstrated an increase in the rate of CS and the utilization of regional anesthesia in a tertiary care university hospital in Turkey based on 7 years of retrospective audit. This finding is similar to that observed in most of the developed countries.

REFERENCES

1. Kuczkowski KM. Anesthesia for cesarean section. In: Chestnut DH, ed. *Obstetric Anesthesia Principles and Practice*. 3rd ed. Philadelphia: Elsevier Mosby; 2004: 421-446.
2. Ngan Kee WD. Report on confidential enquiries into maternal deaths: 50 years of closing the loop. *Br J Anaesth* 2005;94:413-16. [Medline] [Free Full Article]
3. Pang D, O'Sullivan G. Anesthesia and analgesia in labour. *Obstet Gynaecol Rep Med* 2008;18:87-92. [Medline]
4. Analysis global, regional and national estimates. *Paediatr Perinat Epidemiol* 2007;21:98-113. [Medline]
5. Gunaydin B, Tan ED. Intrathecal hyperbaric bupivacaine and ropivacaine with fentanyl for elective caesarean section. *J Matern Fetal Neonatal Med* 2010;23(12):1481-6. [Medline] doi: 10.3109/14767051003678051.
6. Faydaci F, Gunaydin B. Different preloading protocols with constant ephedrine infusion in the prevention of hypotension for elective caesarean section under spinal anesthesia. *Acta Anaesthesiol Belg* 2011;65:5-10. [Medline]
7. Sezer AO, Gunaydin B. Efficacy of patient controlled epidural analgesia (PCEA) after initiation with epidural or combined spinal-epidural analgesia. *Int J Obstet Anesth* 2007;16:226-230. [Medline]
8. Gunaydin B. Obstetric pain and its management in the perinatal period: What do we need to know?. In: *International Textbook of Obstetric Anesthesia and Perinatal Medicine Principles and Practice*, Kuczkowski KM, Drobnik L (eds), Warsaw: Medmedia, 2010; p34-39.
9. Thomas J, Paranjothy S. Royal College of Obstetricians and Gynaecologists Clinical Effectiveness Support Unit. The National Sentinel Caesarean Section Audit Report. London: RCOG Press, 2001.
10. Oyston J. Obstetrical anaesthesia in Ontario. *Can J Anaesth* 1995;42:1117-25. [Medline]
11. Palanisamy A, Mitani AA, Tsen LC. General anesthesia for cesarean delivery at a tertiary care hospital from 2000 to 2005: a retrospective analysis and 10-year update. *Int J Obstet Anesth*. 2011;20:10-16. [Medline] doi: 10.1016/j.ijoa.2010.07.002
12. Reproductive Health Programme Turkey. National Maternal Mortality Study 2005 Key Findings.
13. Çetinkaya Demir B, Ocakoğlu G, Özerkan K, Orhan A, Cengiz C. Cesarean delivery rates and changing indications in our clinic between 200-2010. *Uludag Univ Tıp Fak Derg* 2012;38:123-7.



'My Most Memorable Patient'[®]

A young, physically strong male patient of ASA 1 reported to operating rooms to get removed three of his small lipomas, which were scattered between his anterior abdominal wall and the lateral side of the right thigh. Routine monitors were attached and all his parameters were noted to be within normal limits. General anesthesia (GA) was induced in a routine manner and an LMA was inserted. Inj. pethidine was used to provide analgesia. Everything seemed to be going smooth as planned. The procedure was a short one and there was no hurry. The surgical excision was underway, when about 10 minutes after the induction of GA, the cardiac monitor sounded alarm. A reading showed high BP. The reading was repeated without change. Assuming inadequate analgesia, a second dose of inj. pethidine was given and the depth of anesthesia was increased. After a few minutes BP was measured by the manual (stat) method. It was even still higher. The circuit and the endotracheal tube were rechecked and no fault was detected. The cause of his hypertension could not be found. Just then the surgeon informed that he had finished the surgery. The gases were turned off and 100% oxygen was started. A few minutes later, LMA was removed and the patient was shifted to the PACU. It was hoped that with the cessation of the surgical stimulus, his high BP would settle down, but the increased BP failed to get lowered despite all conservative measures. The patient started to desaturate and developed severe tachycardia. Reintubation was done to provide 100% oxygen by mechanical ventilation. Pink frothy fluid filled the tube and had to be suctioned repeatedly. The next reading was recorded at 220/130 mmHg. The patient was transferred to the ICU and ventilated; CT scan was done on an emergent basis while the patient was on ventilator. A small suprarenal mass was found, suspected to be a pheochromocytoma. Relevant investigations were ordered and medical treatment was provided. The next day after being stabilized, the patient was transferred to a better equipped, central referral hospital for surgical removal of his pheochromocytoma. Patient visited us one month later for follow-up in a perfect condition. On inquiring, he still denied having any episode of high BP or related symptoms any time in his life.

The stress of anesthesia and surgery had somehow, provoked a silent tumor in this asymptomatic young man, which precipitated an episode of acute rise of BP and pulmonary edema.

Dr. Nabil Estemalik
Consultant /HoD Anesthesiology, Oasis Hospital,
United Arab Emirates