

East African Medical Journal Vol. 86 No. 12 December 2009

COMPARISON OF MATERNAL SATISFACTION FOLLOWING EPIDURAL AND GENERAL ANAESTHESIA FOR REPEAT CAESAREAN SECTION

S. Fyनेface-Ogan, FWACS, C.N. Mato, FMCA, FWACS, Obstetric Anaesthesia Unit, Department of Anaesthesia, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria and O. A. Ogunbiyi, FMCA, FWACS, Unimid Level II Military Hospital Sector West, El-Geneina, Darfur-Sudan

Request for reprints to: Dr. S. Fyनेface-Ogan, Obstetric Anaesthesia Unit, Department of Anaesthesia, University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria

COMPARISON OF MATERNAL SATISFACTION FOLLOWING EPIDURAL AND GENERAL ANAESTHESIA FOR REPEAT CAESAREAN SECTION

S. FYNEFACE-OGAN, C.N. MATO and O. A. OGUNBIYI

ABSTRACT

Objective: To assess maternal satisfaction following two anaesthetic techniques (general and epidural anaesthesia) for repeat Caesarean section.

Design: Prospective study.

Setting: University of Port Harcourt Teaching Hospital, Nigeria.

Subjects: One hundred and twenty parturients scheduled for elective Caesarean section.

Results: The demographic data and mean satisfaction scores obtained from questionnaire and visual analogue scale (VAS) were subjected to analysis using the Student's t-test with the computerised statistical calculator SPSS Windows 10.0. The mean satisfaction score of the parturients in the epidural anaesthesia population using the questionnaire was 149.0 ± 10.65 while that in the general anaesthesia population was 105.3 ± 12.42 . The mean satisfaction score from the VAS was 9.0 ± 1.50 for those who had epidural anaesthesia while it was 2.6 ± 0.70 in the general anaesthesia population. The differences in the mean satisfaction scores from both instruments of measurement were statistically significant at $P < 0.05$. Ninety eight patients (89.09%) of the total study population who completed the study, desired to have a repeat Caesarean section under epidural anaesthesia while 12 patients representing 10.91% still desired further surgery under general anaesthesia.

Conclusion: It is concluded that patients are more satisfied with Caesarean section done under epidural anaesthesia.

INTRODUCTION

Maternal satisfaction during child birth is an aspect of obstetric care that is gaining attention worldwide. Measuring satisfaction amongst obstetric patients is frequently associated with setbacks in terms of reliability and reproducibility (1). Being a clinical end point and an indicator of adequacy of care, satisfaction could provide a unique feedback on the quality of practice for medical specialties such as anaesthesia.

For parturients, satisfaction can represent, at least in theory, an evaluation of anaesthetic care experience based on their values, perceptions, and interactions with the healthcare environment. For anaesthetic care providers, patient satisfaction can be used to assess the actual impact of anaesthetic procedure on the patients themselves. This can be readily assessed using both a standard questionnaire and visual analogue scale (VAS). The questionnaire may be more sensitive than the VAS because the satisfaction tools in it stem from

the various physiological and psychological make-ups of the patients.

Despite the paucity of literature on maternal satisfaction, we compared levels of satisfaction amongst Nigerian women previously exposed to anaesthetic service for Caesarean section in our hospital. The findings may reveal the inclination of parturients on the choice of anaesthesia for future Caesarean section.

MATERIALS AND METHODS

This prospective study involving 120 women, with American Society of Anaesthesiologists status I or II scheduled for repeat Caesarean section addressed all ethical issues. The consent form used was modified to meet the concerns of each of the patients involved in the study and was approved by the hospital's Ethics and Research Committee. Following the detailed information on the types of anaesthetics to

be administered, each patient gave a written informed consent to participate in the study. The study was conducted at the UPTH, one of the tertiary-level teaching and referral centres for obstetric care in the Niger Delta region of Nigeria.

Exclusion criteria included objection to either form of anaesthesia, bleeding tendencies such as patients with clotting problems, eclampsia, potentially difficult airway, recent meal taken and mothers for Caesarean section due to non-reassuring foetal heart rate pattern. An anaesthetist other than the one administering the anaesthetic answered questions relating to the potential risks of the anaesthetic technique from the patients. Specific differences between the techniques of anaesthesia were explained to the patients. The physician anaesthetist scheduled for that theatre suite provided anaesthetic care.

Patients were allocated into two groups A and B. Group A were patients with previous Caesarean delivery under general anaesthesia while group B were those who had epidural anaesthesia in the previous Caesarean delivery. All the patients received pre-induction normal saline 10-15ml/kg body weight over 10-15 minutes. Subsequent intravenous fluid requirements were dependent on the need of the patient and given by the attending anaesthetist. All the patients in both groups were positioned in the supine position after the induction of anaesthesia with 20° left lateral displacement of the uterus ensured. The following were monitored in all the patients: SPO₂, ECG, non-invasive blood pressure monitor, urine output collection by urethral catheterisation and ETCO₂ monitor (for those under general anaesthesia).

For group A, the patients were placed in the sitting position and following aseptic techniques, lumbar epidural punctures were performed at the L₃₋₄ interspace using a midline approach with an 18-gauge Tuohy needle. Once the needle was appropriately placed in the epidural space, a 20-gauge multi-orifice epidural catheter (Mini pack; Portex Ltd., Kent, UK) was threaded 3 cm into the space through the cranially directed tip of the needle. Having confirmed a negative aspiration test for blood or cerebrospinal fluid, 3 ml of 2% lidocaine with epinephrine 5µg/ml was injected through the needle as a test dose. The patients were also observed for any increase in heart rate that would indicate intravascular injection of epinephrine and were questioned about dizziness, tinnitus, metallic taste in the mouth, or sudden warmth or numbness in the legs. If these responses were negative after 5 min, 20 ml of 0.5% plain bupivacaine was injected as a bolus single dose via the epidural catheter. The catheter was fixed to the skin and the patients were returned to the supine position with left lateral uterine displacement.

The attending anaesthetist noted any paraesthesia during the insertion of the catheter, inability to advance the catheter, and intravenous or subarachnoid canulation. Intravenous or subarachnoid canulation was detected by aspiration of frank blood or cerebrospinal fluid through the catheter. If intravascular or subarachnoid canulation occurred, the catheter was withdrawn one centimetre. If this did not lead to withdrawal from the vein or subarachnoid space, the catheter was removed. If it was not possible to thread the catheter, it and the needle were withdrawn together. The procedure was then repeated at the level of L₂₋₃; if unsuccessful again, the patient was excluded from the study and general anaesthesia administered.

The attending anaesthetist assessed the following variables: the onset of sensory block (assessed by pinprick); the existence of unblocked segments; the extent of sensory and motor block (assessed by the modified Bromage score); and side effects or complications caused by the epidural anaesthesia, including hypotension (systolic blood pressure <100 mmHg or a decrease of >20% from baseline), postoperative urinary retention, post dural puncture headache (PDPH), and transient neurological deficits. Complete loss of cold sensation to T₈ dermatome on both sides was regarded as an appropriate level of block for surgery.

Group B received general anaesthesia with relaxant technique. All the patients were preoxygenated with 100% oxygen for 3 minutes. A rapid sequence induction with cricoid pressure was performed using thiopentone 5mg/kg body weight followed by suxamethonium 1.5mg/kg body weight. The trachea was intubated with a cuffed endotracheal tube. Atracurium 0.3 mg/kg body weight was used to maintain muscle relaxation. Maintenance of anaesthesia was with 0.5% halothane in nitrous oxide/oxygen (50:50) mixture. Following the delivery of the baby, 5 units of synthetic oxytocin bolus was given intravenously, and an infusion was commenced with 10 units oxytocin in 500 ml 5% dextrose saline solution and tailored according to needs of the parturient. For intraoperative analgesia, intravenous pentazocine (derivative of Benzomorphaun) 30 mg was given. At the end of the procedure, nitrous oxide and halothane were discontinued and 100% oxygen administered. Following adequate reversal of muscle relaxant, using 1.2mg atropine and then 2.5mg neostigmine, the oropharynx was suctioned dry. The trachea was extubated when the patient was fully awake and she was transferred to the recovery room.

The intra-operative complications from the two anaesthetic options were promptly treated. Patients converted from one form of anaesthesia to another were excluded.

A modified 29-item questionnaire was developed from the Likert's scale (2). It had qualified content and construct validity that consisted of four sections related to satisfaction. These were:

- (i) Communication and control
- (ii) Anaesthetic effects
- (iii) Postoperative problems
- (iv) Minor side effects.

Reliability was tested with Cronbach's alpha coefficient, which was 0.77. Each item on the scale ranked from 1-7, 1= strongly disagree, 7=strongly agree with a possible total score of 203 (maximally satisfied) and least score of 29 (least satisfied). The maternal satisfaction VAS (10 cm scale) used had completely unsatisfied at the far left (1 cm) and totally satisfied at the far right (10 cm). Satisfaction for the anaesthetic option offered was assessed 24 hours after delivery. All analyses were conducted using the SPSS 10 analysis package (SPSS Inc. Chicago, IL, USA). A comparison of means of satisfaction levels between the two groups was performed using Student's t test and a significance level of 0.05.

RESULTS

A total of 120 women were approached for this study, 110 of them satisfied the criteria for recruitment giving a response rate of 91.67%. Out of the 10 women (8.33%) that were excluded, four (3.33%) women refused while six (5%) women had failed regional anaesthesia that was converted into general anaesthesia. The modified satisfaction tools used in this study are shown in Table 1.

There was no difference in the demographic data between the two groups of patients (Table 2). The mean satisfaction score for the patients in the epidural group was 149.0 ± 10.65 while the mean score for the general anaesthesia group was 105.3 ± 12.42 with significant difference between the groups ($p < 0.05$, student's t-test). The mean satisfaction score for the epidural group using the VAS was 9.0 ± 1.50 while the general anaesthesia group was 2.6 ± 0.70 ($p < 0.05$ student's t-test). Therefore, there was a significant difference in the means of satisfaction between epidural anaesthesia and general anaesthesia using the two instruments of measurement.

Table 1
Satisfaction factors (tools) used in the questionnaires

Category	Factor	Item
1	Interaction with operating room staff (Communication and control)	Sense of control, seeing and holding baby (Baby bonding), knowledgeable about what staff was doing, able to interact with staff
2	Anaesthetic/Technical effects	Easy needle insertion, pain on needle insertion, pain on intravenous drug administration, feeling of endotracheal tube being passed, comfortable position for block, foeto-maternal safety of anaesthetic agent
3	Intra/postoperative events	Back problems, awareness, comfortable atmosphere, postpartum recovery, ability to nurse baby, generalised body pains, nausea and vomiting
4	Side effects	Dry throat and lips, shivering, mood change, sore-throat

Table 2
Demographic data and mean satisfaction scores

Parameter	General anaesthesia (n=55)	Epidural anaesthesia (n=55)	P-value
Age (years)	28 ± 1.2	27 ± 1.3	Ns
Height (cm)	154.34 ± 4.42	159.23 ± 3.38	Ns
Weight (Kg)	82.5 ± 2.87	78.9 ± 4.33	Ns
Educational status			
University	13	11	
Secondary	23	18	
Primary	8	12	
No formal education	11	14	
Satisfaction level			
Questionnaires	105.3 ± 12.42	149.0 ± 10.65	<0.05
VAS	2.6 ± 0.70	9.0 ± 1.50	<0.05

Data shown as Mean ± Standard deviation, NS= Not Significant, VAS = Visual analogue scale

Table 3
Intraoperative outcomes

Complication	General anaesthesia		Epidural anaesthesia	
	No.	(%)	No.	(%)
Drowsiness or residual sedation	51	92.73	0	0
Nausea and vomiting	36	65.46	22	40
Sore throat/ hoarseness of voice	28	50.91	0	0
Shivering	14	25.46	36	65.46
Incisional pain	47	85.46	6	10.91
Numbness in legs	0	0	42	76.36
Backache	13	23.64	31	56.36
Hypotension	22	40.00	8	14.55
Headache	8	14.55	18	32.73

The maximal satisfaction score in the epidural population was 168 and the least was 133. In the general anaesthesia group however, the maximal score obtained was 133 and 84 as the lowest. Only two of the patients (9.52%) in the general anaesthesia group had satisfaction levels above 120, a score lower than that of the least satisfied patient in the epidural group. The most satisfied patient scored 10cm on the visual analogue scale (VAS) while least satisfied as 0 in the epidural group. A total of six parturients were fully satisfied with the technique while the least satisfied scored 7.5cm. Using the

VAS to assess level of satisfaction in the general anaesthesia group showed that seven patients in the general anaesthesia group were not satisfied (VAS=0). Three patients scored 5 on the scale as maximal scores.

The intra/postoperative events shown in Table 3 revealed that the commonest complaints in the epidural group were numbness in the lower limbs (42/55) (76.37%) and backache (31/55) (56.37%) while in the general anaesthesia group these were drowsiness/residual sedation (51/55) (92.73%) and pain on incision (47/55) (85.46%).

DISCUSSION

Patient satisfaction with anaesthesia care as an important measure of quality of care that contributes to a balanced evaluation of the structure, process and outcome of services is now frequently reported (3). The development of a reliable and valid satisfaction questionnaire for Caesarean section has allowed comparison in satisfaction between epidural and spinal anaesthesia for elective Caesarean section to be studied (4). However the trend of anaesthesia for Caesarean section in our hospital is towards the use of regional techniques (5), although many parturients in our hospital still request for general anaesthetics for Caesarean operation. It has been shown that the attending anaesthetists mainly suggest most of the anaesthetics administered to these patients (6). Such decisions are taken with the patients oblivious of the various options available. Therefore, satisfaction can be considered as an important feedback used to guide the dissemination of information and involvement of patients in decisions about their treatment (7).

Maternal satisfaction during delivery can be influenced by many factors. Some of these factors such as mood changes and other psychological make-ups are not within the control of the caregiver. Factors such as pain control, nausea and vomiting are however within the control of the team. Four major factors were used to assess the satisfaction levels amongst patients in this study. These were interaction with staff, anaesthetic/technical effects, intra/postoperative events and side effects of the agents used. Unlike the work by Sindhvananda *et al* (8), interaction with staff/family was included in our study.

The dimension which incorporates baby bonding, seeing and holding of the baby caused a significant difference in satisfaction between the two groups. A confounding bias could not be prevented as all the patients had been previously exposed to anaesthesia to compare levels of satisfaction between the two experiences. For proper self-assessment of experiences from types of anaesthesia received, all the patients were interviewed 24 hours postoperative. The attending ward nurse conducted the interview using the modified Likert's scale, of measurement, as some of the patients did not receive any formal education. This however, may not exclude the halo effects that are likely to result from the services rendered.

Intraoperative events can greatly influence satisfaction scores of patients under anaesthesia. In this study the feeling of sense of control and maintenance of verbal contact with staff (communication) impacted a positive influence on the level of satisfaction in the epidural group. This finding seems to correlate with that of other workers in which women showed satisfaction with the ability to make some input in their management during the delivery process and

also, afforded them an earlier contact with their newborn (9,10). Our study showed that the general anaesthesia group was less satisfied with this factor. This was most likely due to the loss of consciousness associated with this form of anaesthesia. A recent study by Morgan *et al* (4) and Sindhvananda *et al* (8) compared maternal satisfaction for spinal and epidural anaesthesia for Caesarean section and showed no significant difference between the two forms of regional anaesthesia. This could be due to the wakeful state associated with regional anaesthesia.

Puncture with the Tuohy needle however, was the most dissatisfying factor in the epidural group in spite of adequate infiltration of the skin with local anaesthetics. This experience negatively influenced their satisfaction scores. Thirty one (58.49%) patients in this group experienced moderate to severe back pain in the post-operative period and attributed it to the Tuohy needle. These findings are consistent with an earlier report which showed a survey of patients who refused epidural anaesthesia due to pain in the back (11). Epidural analgesia is frequently associated with backache but studies show that this problem has no relationship with the procedure (12,13). Most of these parturients have an already existing low backache associated with postural change in pregnancy (14). The use of generous infiltration of the interspinous ligament with smaller needles, and the effective use of local anaesthetic agents such as eutectic mixture of local anaesthetic agent (EMLA) prior to needle insertion for epidural anaesthesia could help to improve maternal satisfaction levels amongst these patients.

Pain at the surgical site observed in the immediate postoperative period was one of the most uncomfortable experiences in 53 (92.98%) patients in the general anaesthesia group while 16 (30.19%) patients had similar experience in the epidural anaesthesia group. In this study, the two groups of patients were essentially managed with opioid analgesics for postoperative pain relief in the first 24-48 hour period. Assessing the satisfaction levels for pain relief postoperatively showed that those in the epidural group were more satisfied. This compares to previous reports and may be due to a delayed return of pain sensation and therefore, a delayed demand for narcotic analgesics (15, 16).

Satisfaction with childbirth is a multidimensional issue, of which analgesia is but one component. The importance of analgesia as a contribution to overall satisfaction has been recognised, but improvement in quality of available analgesia has not always resulted in commensurate improvement in satisfaction. Pain relief in childbirth is subject to many social and cultural modifiers, which continue to change. Control of pain rather than absolute amelioration is seen by many to provide greater satisfaction. Analgesia issues still do not figure prominently in

the overall satisfaction of the birthing process for the vast majority of women, despite the availability of and demand for improved methods of relief. The interpersonal relationships established between patient and healthcare providers may ultimately be of more importance in the determination of satisfaction with management (17).

The presence of adverse events such as postoperative nausea or vomiting and postoperative pain was significantly associated with patient dissatisfaction. The risk of dissatisfaction increased as the number of postoperative complications increased. This is not surprising as most of these patients were aware of expectations of intraoperative events from discussions with other patients and from previous anaesthetic experiences. This finding however, is different from the work of Tramar *et al* (18) in which the patients had a first time anaesthetic experience oblivious of adverse postoperative outcome.

Postoperative nausea and vomiting remain amongst the most common post-anaesthetic problems despite anaesthetic and pharmacological advances. In this study, postoperative nausea and vomiting (PONV) was observed in 36 (63.16%) patients of the general anaesthesia group and 22 (41.51%) patients amongst the epidural group. This compares with a report in which PONV was more common in women and varied from one to 15 times within the first 24 hours postoperatively (19). Many general anaesthetics and narcotic analgesics have been known to induce or facilitate nausea and vomiting. Nitrous oxide has been suspected as a cause of PONV, although no association has been shown (20). Regional anaesthesia however, is associated with less PONV than general anaesthesia, perhaps because gastric emptying is less affected. Nausea and vomiting postoperatively can cause a delay in early return to oral feeding and prolong the period of hospitalisation. This combination was a source of dissatisfaction amongst patients that had the experience in both groups but more in the general anaesthesia group. No routine anti-emetic prophylaxis was administered in this study.

Shivering has been known to occur during epidural anaesthesia (19). The aetiology of this remains unknown, but its effects include increased metabolic rate and plasma catecholamine concentrations, and patient discomfort. In this study, 14 (24.56%) patients in the general anaesthesia group experienced shivering during the postoperative period whereas 36 (67.93%) patients had it in the epidural anaesthesia group. All the patients who had this experience were promptly treated with intravenous tramadol. Sub-anaesthetic doses of ketamine readily available in our environment, has been found to be a useful alternative in the treatment of shivering (21). This morbidity however, did not affect the satisfaction levels of the patients in the epidural group. In spite of

the shivering which some described as severe, they still desired future operations to be done under the same anaesthetic procedure.

Evidence supports the shift in trends of practice towards shared decision-making, where patients are encouraged to express their views and participate in making clinical decisions (22). Patients are also becoming more informed about the various options available in anaesthetic care and their participatory role in treatment outcome. Their demand for involvement in such decision-making processes for a particular anaesthetic technique may cause an increased demand in regional anaesthesia for Caesarean section. This could be a reflection of satisfaction for that form of anaesthetic care with a tendency to have the same experience again.

In conclusion, this study showed that most of the parturients preferred regional anaesthesia for operational delivery. With the rising trend of including patient's preferences and participation in decisions regarding their care, the preferred anaesthetic care may be the sole decision of the patients, a challenge to the unskilled anaesthetist. Unavailability of the anaesthetic care of preference may therefore, have a negative impact on their level of satisfaction with the care.

ACKNOWLEDGEMENT

We thank Mrs. G. Sotonye-Ogan for secretarial services

REFERENCES

1. Fung, D. and Cohen, M.M. Measuring patient satisfaction with anaesthesia care: a review of current methodology. *Anesth. Analg.* 1998; **87**: 1089-1098.
2. Likert, R. A technique for the measurement of attitudes. *Archives Psych.* 1932; **140**: 39 - 41.
3. Hodnett, E.D. Pain and women's satisfaction with the experience of childbirth: a systematic review. *Am. J. Obstet. Gynecol.* 2002; **186(Suppl 5)**: S160-S172.
4. Morgan, P. J., Halpern, S. and Lam-McCulloch, J. Comparison of maternal satisfaction between epidural and spinal anaesthesia for elective caesarean section. *Can. J. Anesth.* 2000; **47**: 956-961.
5. Fyneyface-Ogan, S., Mato, C. N. and Odagme, M. T. Anaesthesia for caesarean section: a ten year review. *World Anaesthesia.* 2005; **8**: 18-21.
6. Ruland, C.M. Decision support for patient preference-based care planning: effects on nursing care and patient outcomes. *J. Am. Med. Inform. Assoc.* 1999; **6**: 304-312.
7. Salmon, P., Miller, R. and Drew, N. C. Women's anticipation and experience of child birth: the independence of fulfilment, unpleasantness and pain. *Br. J. Med. Psychol.* 1990; **63**: 255-259.
8. Sindhavanada, W., Leelanukrom, R., Rodanant, O. and Sriprajittichai, P. Maternal satisfaction to epidural

- and spinal anaesthesia for caesarean section. *J. Med. Assoc. Thai.* 2004; **6**: 628-634.
9. Green, J.M. and Baston, H.A. Feeling of control during labour: concepts, correlates and consequences. *Birth.* 2003; **30**: 235-238.
 10. De Andres, J., Valia, J.C., Gil, A. and Bolinches, R. Predictors of patients' satisfaction with regional anaesthesia. *Reg. Anaesth.* 1995; **20**: 498-505.
 11. Gajraj, N.M., Sharma, S., Souter, A.J., Pole, Y. and Sidawi, E. A survey of patients who refuse regional anaesthesia. *Anesth. Analg.* 1993; **78**: S126.
 12. Russell, R., Dundas, R. and Reynolds, F. Long term backache after childbirth: prospective search for causative factors. *Brit. Med. J.* 1996; **312**: 1384-1388.
 13. Breen, T. W., Ransil, B. J., Groves, P. A. and Oriol, N. E. Factors associated with back pain after childbirth. *Anaesthesiology.* 1994; **81**: 29-34.
 14. Fast, A., Shapiro, D., Ducommun, E., et al. Low back pain in pregnancy. *Spine.* 1987; **12**: 368-371.
 15. Juul, J., Lie, B. and Friberg N. S. Epidural analgesia versus general anesthesia for caesarean section. *Acta. Obstet. Gynecol. Scand.* 1988; **67**: 203-206.
 16. Avard, D.M., and Nimroof, C.M. Risks and benefits of obstetrical epidural analgesia: a review. *Birth.* 1985; **12**: 215-225.
 17. Ross, A. Maternal satisfaction with labour analgesia. *Baillieres. Clin. Obstet. Gynaecol.* 1998; **12**: 499-512.
 18. Tramar, M., Moore, A. and McQuay, H. Meta-analytic comparison of prophylactic antiemetic efficacy for postoperative nausea and vomiting: propofol anaesthesia versus. omitting nitrous oxide versus. total intravenous anaesthesia with propofol. *Br. J. Anaesth.* 1997; **78**: 256-259.
 19. Soyannwo, O.A., Ajuwon, A.J., Amanor-Boadu, S.D. and Ajao, O. G. Post operative nausea and vomiting in Nigerians. *East Afr. Med. J.* 1998; **75**: 243-245.
 20. Sessler, D.I. and Ponte, J. Shivering during epidural anaesthesia. *Anesthesiology.* 1990; **72**: 816-821.
 21. Mato, C.N., Isa, I.J. and Fyनेface-Ogan, S. Post-spinal shivering: comparing the effects of ketamine and tramadol. *Nig. J. Orth. Trauma.* 2002; **1**: 17-20.
 22. Frosch, D.L. and Kaplan, R.M. Shared decision making in clinical medicine: past research and future directions. *Am. J. Prev. Med.* 1999; **17**: 285-294.