A Follow-up Programme for Preventing Post-Operative Anaesthetic Complications in Obstetric Care

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Abstract
Context: Following obstetric anaesthesia and surgery, complications occurring in the postoperative period are important causes of morbidity and mortality. Prompt identification and management is important to improve the quality of postpartum care.
Objective: To identify postoperative complications occurring in post partum patients in the ward, to find a way of minimizing such complications and to determine ways of improving services for the obstetric patients.
Study Design, Setting and Subjects: This is a prospective study of two hundred and fifty parturients who had Caesarean section under either general or regional anaesthesia in the University of Benin Teaching Hospital between January to August, 2004.
Main Outcome Measures: Identification of complications occurring in the postoperative period in the ward for the first three days and assessment of the severity of pain.
Results: Complications were identified in 37.2% (n=93) patients. The commonest complications were pain at the operation site - 24% (n=60), post dural puncture headache (PDPH) - 2% (n=5), hypertension - 2% (n=5), headache of other origin - 2.4% (n=6) , back pain 2.8% (n=7) and monoplegia 0.4% (n=1).
Conclusion: This study shows a high incidence of non-anaesthesia related complications. However, the anaesthesiarelated complications were of a more serious nature.

Key Words: Obstetric Anaesthesia, Postoperative Complications, Outcome [Trop J Obstet Gynaecol, 2006, 23:160-164]

Introduction

Anaesthesia in obstetric patients remains a procedure with special risks, although in western countries there has been a remarkable reduction in maternal and foetal morbidity and mortality during the past few decades.[1] Adequate pain management depends on complete and consistent assessment and documentation of the patient's pain.[2] Post dural puncture headache has a major impact on morbidity and patient satisfaction. It was considered to be the worst aspect of the hospital stay by 49% of parturients who experienced a headache in a survey conducted by Costigan et al.[3]

The importance of monitoring for neurological complications following regional anaesthesia in obstetrics has also been emphasized.[4,5] Early diagnosis and prompt treatment will usually lead to complete resolution of the neurological deficit.

For the past two years our department has established a team of anaesthetists who mandatorily cover the obstetric unit including the postoperative period. The head of the team is a consultant, while the other members are senior and junior residents rotating through the unit for a period of three to six months. One of the functions of the team is to visit patients in the ward in the post anaesthetic period for at least 72 hours and more for serious cases (until they are discharged home).

The aim of this study is to identify complications occurring in the postoperative period in the wards, find ways of minimizing such complications and improve anaesthetic services to the obstetric patients.

Patients and Methods

After approval of the local Hospital Ethics Committee and informed verbal consent, 250 patients that had Caesarean sections were studied for a period of 8 months (January August 2004). Patients classified American Society of Anesthesiologists (ASA) health status IV and V were excluded because these groups of patients are either severely ill or moribund; they have little physiologic reserve and are already incapacitated.

The methods of anaesthesia for the parturients were general anaesthesia using relaxant technique or regional anaesthesia (spinal or epidural). For spinal anaesthesia, pencil point spinal needle (Whitacre) size 25 gauge was used while Touhy needle, size 18 gauge was used for single dose epidural anaesthesia. Epidural catheters were inserted for top ups of bupivacaine when necessary. Following surgery, the patients were transferred to the recovery room for postoperative care. When the vital signs were stable, they were transferred to the lying-in-ward. The members of the anaesthetic team in charge of the obstetric unit visited all the patients daily for a period of 72 hours in the postoperative period and more than 72 hours in case of serious and critical cases such as postdural puncture headache (PDPH). The complaints and the results of a clinical examination were recorded.

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A special form was prepared containing standard questions such as patients characteristics (age, weight, height, ASA physical status, Mallampati score) and complaints - headache (site and severity), back pain, pain at the operation site and its severity, urinary retention, paraesthesia of the lower extremities and inability to walk, sore throat, cough. The complications when identified were managed accordingly. Outcome of management was also documented.

In our Institution, postoperative pain management is usually prescribed by the obstetricians. It consists of either intramuscular pentazocine 30mg 4 hourly for the first 48 hours or tramadol hydrochloride100mg 8 hourly and paracetamol tablets when oral feeds commence.

Pain was assessed using the Visual Analogue Scale (VAS): 0= no pain, 10=worse pain, 1-9mm (mild to moderate pain). Patients were asked about the nature of postoperative pain, satisfaction with their pain relief and if not satisfied to score their pain on a visual analogue scale of 0-10. The degree of relief the analgesic gave them and if the frequency was satisfactory was also noted. Patients were interviewed for the first 48 hours postoperatively and the answers were collated.

The data were analyzed for statistical significance using Instat Graph Pad tm, chi-square or Fisher exact test (with Woolf approximation). A P value of <0.05 was considered statistically significant.

Results

Two hundred and fifty patients were studied. The sociodemographic characteristics of the patients are shown in Table 1. Twenty two percent (n=55) had Caesarean section under general anaesthesia while 78% (n=195) had regional anaesthesia: spinal (182), epidural (13). Incidence of emergency cases (64%) was higher than that of elective (36%)

Complications were recorded in 93 (37.2%) patients (Table 2).The complications identified in the patients in the ward ranged from pain at the operation site - 24% (n=60), headache - 2.4% (n=6), postdural puncture headache (PDPH) - 2% (n=5), back pain - 2.8% (n=7), sore throat - 1.2% (n=3), pain at the lumber puncture site - 0.8% (n=2), hypertension - 2%(n=5) and monplegia after regional anaesthesia - 0.4% (n=1),

There was a high incidence of pain at operation site. It was considered statistically significant when compared with the incidence of the other complications combined. P=0.0027, Odds Ratio=2.077, 95% CI: 1.301 3.314 (using approximation of Woolf). 40 patients (66.7%) complained of severe pain, 10 (16.7%) of moderate pain and 10 (16.7%) of mild pain, 24 hours postoperatively. 48 hours postoperatively, 30 (50%) complained of mild pain, 20 (33.3) moderate and 10 (16.7%) severe (VAS of 8). 20 % complained of inadequate pain relief at night.

The incidence of non-anaesthesia related complications were higher than anaesthesia related. The difference was considered statistically significant. P<0.001, Odds Ratio=0.1956, 95%CI: 0.1139 0.3360 (using approximation of Woolf).

Five patients (2%) had PDPH. They complained of severe headache, fronto-occipital, worse on sitting or standing and relieved when lying on bed. Two out of these patients that developed PDPH had accidental dural puncture during epidural technique. Those that developed postdural puncture headache (PDPH) were advised to have strict bed rest in addition to increased fluid intake and intramuscular tramadol hydrochloride 100mg 8 hourly was prescribed. Those that had headache of other origin and back pain were given tramadol hydrochloride 50mg 4 hourly or oral paracetamol 1gm thrice daily when oral feeds commenced. The patients that complained of pain at operation site were managed with either pentazocine 30mg or tramadol hydrochloride 50mg 4 hourly. Their prescription was determined by the severity of pain. The headache resolved gradually from the second day and by the third day they no longer experienced headache.

Seven patients (2.8%) complained of back pain. All had regional anaesthesia (5 had spinal anaesthesia while 2 had epidural anaesthesia). The incidence of back pain was higher (15%) among those that had epidural anaesthesia compared with spinal anaesthesia (2.8%) Two other patients complained of pain at lumbar puncture site.

The three patients that developed mild sore throat had endotracheal intubation for operative delivery. They were reassured and when necessary had dequadine lozenges.

There was one case (0.4%) of neurological complication (monoplegia). The patient complained of paraesthesia and pain in the right leg during the spinal needle insertion. In the ward she complained of numbness on the lateral part of the thigh and the leg as well as inability to move the same leg. She was managed with non-steroidal anti-inflammatory drug (Ketorolac) tramadol hydrochloride, steroid (prednisolone) and dolo-neurobion tablets. When there was not much improvement, she was referred for physiotherapy and she made gradual improvement. We visited her on the ward for about 15 days while she waited on her baby who also was on admission in the Special Care Baby Unit (SCBU). When the patient was seen during her first post natal visit, clinical assessment

Table 1: Socio-Demographics Data of Patients

	Mean/SD
Age(yrs)	30.67 ±5.02
Weight (kg)	74.84 ±13.85
Height (cm)	163.67 ±30.19

ASA 1/2/3-130/90/30
Mallampati score 1/2/3-66/100/82
Elective/ Emergency-90/160
ASA- (American Society of Anesthesiologists) Health Status

revealed a remarkable improvement and there was no more complain of pain.

Hypertension was identified in five patients (2%) with pregnancy induced hypertension (P.I.H) and pre-eclampsia. They were managed with antihypetensives (methyldopa 500mg 8 hourly or nifedipine 20mg daily). The outcome of management of complications was very satisfactory.

Discussion

Pain at the operation site was the most commonly reported complication (24%). The pain ranged from moderate to severe. Postoperative pain management is usually handled by the obstetricians in our centre. The commonly used drugs for postoperative pain during the period of study were pentazocine or tramadol hydrochloride because the potent opioid analgesics (such as pethidine and morphine) were not available for use. When the patient commences oral feeds, paracetamol tablets is prescribed. Our study also showed that a major contributory factor to the high incidence of postoperative pain is the human factor: lack of strict adherence by the nursing staff to the prescriptions. This may be partly due to the fact that these patients do not scream in pain as the joy of having a new born child overshadows their pain. The nurses are probably afraid of respiratory depression following the use of opioid analgesics.

The International Association for the Study of Pain defines pain as an unpleasant sensory or emotional process, associated with actual or potential tissue damage.[6] Acute pain needs to be treated effectively in order to prevent other postoperative complications such as hypoventilation, atelectasis, hypoxaemia and cardiovascular problems. In the early postoperative period, the use of an opioid is recommended for moderate to severe pain.[7] Morphine, a constituent of opium, is said to be the safest and most effective analgesia for severe pain.[8]

Many pain treatment modalities are available that provide superior analgesia when compared with intramuscular opioid administration when necessary. Patient Controlled Analgesia (PCA) provides excellent analgesia for patients of various settings.[9] Similarly, epidural and intrathecal opioids and combinations of opioids with local anaesthetics have shown to provide excellent analgesia[10]. More recently, aggressive use of regional anaesthetic techniques is popular[11], in the concept of multilmodal or balanced analgesic techniques.[12] Continued interest in providing perioperative pain control is driven by our belief that pain control after surgery is a vital part of perioperative patient care. There is growing evidence that pain control after surgery leads to improved outcome.[13]

There is need to develop acute pain management guides or practice guidelines that have been developed by the International Association for the Study of Pain[14] and the American Society of Anesthesiologists[15]. The goal of an acute pain service (APS) is to improve postoperative pain management by applying effective methods of analgesic control.[16] In a University setting, the service is usually staffed by a pain management attending physician, an anaesthesiology resident, a clinical nurse specialist and a pharmacist.[16]

PDPH was another complication recorded in the postoperative period. The patients that developed PDPH in our study complained of fronto-occipital headache, worse on sitting or standing and relieved when lying down. These patients were managed conservatively which consisted of bed rest, increased fluid intake intravenously or orally, the use of analgesics (tramadol hydrochloride 50-100mg parenterally or orally depending on whether the patient had started oral intake). After three to four days, the headache resolved, no patients required a blood patch. If the severe headache had persisted for more than three days, our team would have considered the use of blood patch. The other patients that complained of headache not related to regional techniques were managed accordingly without any sequaelae.

The first report of spinal headache was in 1899 by August Bier on his own experience with a spinal anaesthetic performed using a Quincke cut needle. He also noted a complaint of backache.[17] PDPH is characterized by the postural dependency, it is worsened when the subject sits or stands and is relieved when the subject lies down[18] as observed in our study. The use of pencil point spinal needles is associated with a lower incidence of postdural puncture headache (PDPH) than with cutting Quincke-tip needles of comparable sizes.[19,20] The headache is believed to result from the loss of CSF through the meningeal needle hole resulting in decreased buoyant support for the brain. In the upright position the brain sags in the

Table 2: Frequency of Complications

Type of Complication	Complications	Incidence
Central Nervous System	Pain in the operation site	60 (24%)
	Postdural puncture headache	5 (2%)
	Other types of headache	6 (2.4%)
	Monoplegia	1 (0.4%)
	Fever	1 (0.4%)
Cardiovascular System	Hypertension	5 (2%)
Respiratory System	Sore throat	3 (1.2%)
	Cough	1 (0.4%)
Others	Back pain	7 (2.8%)
	Pain at the lumbar puncture site	2 (0.8%)
	Neck Pain	2 (0.8%)
Total		**93 (100%)**

cranial vault putting traction on pain sensitive structures. Accidental dural puncture with large bore epidural needle is followed by severe PDPH in at least two thirds of obstetric patients.[21] the incidence of postdural puncture headache in our study was 2%. Previous study reported an almost similar incidence of 2.5% PDPH; 20% complained of a headache that was of other origin.[22] Headaches that occur after child birth do not necessarily signify PDPH, even in those patients with a history of neuraxial block.[23] Our study also revealed 2.4% incidence of headache of other origin.

The patients that complained of back pain had regional anaesthesia. Although postoperative backache occurs following general anaesthesia, it is said to be more common following epidural and spinal anaesthesia.[25] Compared with spinal anaesthesia, back pain following epidural anaesthesia is more common (11% vs 30%) and of a longer duration.[26] Our study showed similar observation. Importantly, back pain has been cited in one study as the most common reason for patients to refuse future epidural block.[26] The aetiology of back pain is not clear, although needle trauma, local anaesthetic irritation, and ligamentous strain secondary to muscle relaxation have been offered as explanations.[25] Some other studies have provided evidence that postpartum back pain is most likely to be a continuation of antepartum pain.[27,28]

One patient in our study developed monoplegia due to direct nerve trauma. She complained of severe pain in the right leg during spinal needle insertion and the pain persisted in the postoperative period. She was managed with ketorolac, tramadol hydrochloride, steroid (prednisolone) and dolo-neurobion. When there was no much improvement, the patient was referred for physiotherapy. She responded gradually to treatment until she was discharged home. Serious neurologic injury is a rare but widely feared complication of epidural and spinal anaesthesia. Multiple large series of spinal and epidural anaesthesia reported that neurologic injury occurs in 0.03-0.1% of all central neuraxial blocks, although in most of these series the block was not clearly proven to be causative.[29] Persistent paraesthesia and limited motor weakness are the most common injuries although paraplegia and diffuse injury to cauda equina roots (cauda equina syndrome) do occur rarely. Injury may result from direct needle trauma to nervous tissues at the level of the spinal cord, nerve root or peripheral nerve, from spinal cord ischaemia, from accidental injection of neurotoxic drugs or chemicals, from introduction of bacteria into the subarachnoid or epidural space or rarely from epidural haematoma.[26,30] Although neurological complications may be secondary to the labour and delivery process, the neural block is usually considered causative until proven otherwise.[31]

Auroy et al prospectively monitored neurologic complications in more than 103,000 regional anaesthetics, all deficits were present within 48 hours after ananesthesia.[31] Most (29/34) were transient with recovery occurring between 2days and 3 months. Spinal anaesthesia was significantly more likely to result in both neurologic injury (5.9 vs 2/10,000) and radiculopathy (4.7 vs 1.7/10,000), compared to epidural anaesthesia. Scott et al monitored 505,000 epidural blocks in parturients finding only 38 single root neuropathies (0.75/10,000).[32] All deficits resolved by 3 months except for one. In a similar study involving

123,000 regional anaesthetics in parturients, 46 cases of single nerve root neuropathies were reported (3.7/10,000) with complete recovery in all patients by 3 months.[33] A case of mononeuropatrhy was also reported by Yokoyama et al.[34]

Sore throat was documented in 1.2% of the patients that had tracheal intubation. The patients concerned were reassured and managed accordingly. Sore throat, though a minor complication is said to be very common following endotracheal intubation.[35] The patients that had hypertension in the ward were those that presented with PIH and PET. They were managed with antihypertensive agents.

In conclusion this study further confirms the need for a designed follow-up programme by the anaesthetists and the establishment of a pain management team comprising the obstetrician, anaesthetist and the nursing staff. Although the incidence of non-anaesthesia related complications are higher, the identified serious complications such as PDPH, back pain and monoplegia were anaesthesia related. Close monitoring for early detection and therapy of complications is essential.

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