



Practice of Obstetric Anesthesia for Ceasarean in Developing Countries: A Prospective Study about 268 Cases

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Abstract

Aim: The aim of his study was to evaluate the practice of obstetric anesthesia in Niger.

Patients and Methods: A prospective, multicentric, descriptive study was conducted in the obstetric centers of Niger during one week. Were included in the study, all parturients admitted to the operating room for caesarean surgery in emergency or elective in public hospitals. The following variables were analyzed: age, indication of caesarean, Mallampati score, American Society of Anesthesiologists (ASA) physical status classification, preoperative prescriptions, delay of the surgery, technique of anesthesia used, incidents and accidents, post operative prescriptions and evolution, anesthetist qualification, incidents and accidents, mortality, duration of hospitalization, post-operative follow-up was one week. Data were analyzed with Epi Info 6™ (Centers for Disease Control and Prevention Atlanta, GA).

Results: This study included 268 cesareans out 802 patients operated (33.41%). Their average age was $26,8 \pm 9,05$ years, ranging from 15 to 44 years and 27.60% had a cesarean history. For Mallampati score; 82.80% of the patients were classified Mallampati 1; 17.20% Mallampati 2. The anesthesia risk; 65.70% of the patients were classified as ASA class 1; 29.10% ASA class 2 and 5.20% of them ASA class 3. Surgery was urgent in 88.10%. The main indications were: scar uterus (25.37%), third trimester hemorrhages (18.65%) and eclampsia (14.18%). Spinal anesthesia was performed in 67.20%; general anesthesia was used in 32.80% of cases. Anesthesia has been done by a nurse anesthetist only in 73.89% of cases. Spinal anesthesia was done with bupivacaine associated with fentanyl or morphine. For induction of general anesthesia, the intravenous narcotics used were ketamine in 62.50% of cases and thiopental in 37.50% of cases. The maintenance of anesthesia, halothane was the most commonly used halogen. Fentanyl was the only available used narcotic. All patients received postoperative multimodal analgesia. The average hospital stay was $4.61 \text{ days} \pm 1.63$ and the mortality was 2.20%.

Conclusion: Obstetric anesthesia accounts for the largest share of anesthetic activity in hospitals in Niger. This is accompanied by a morbidity and mortality whose improvement passes by the sensitization of the parturients and the training of the personnel in quantity and in quality and their homogeneous distribution on the whole territory.

Keywords

Practice; Obstetric anesthesia; Niger hospitals

Introduction

Anesthesia for caesarean section is a technique in constant increase throughout the world, especially in developing countries contributing to a reduction of maternal and infant mortality; it is an anesthesia at risk due to physiological pregnant women.

There are two anesthetic techniques available to the practitioner, general anesthesia and loco regional anesthesia. The indications for general anesthesia have changed but this technique remains appropriate for the management of caesarean sections in extreme emergencies.

In industrialized countries, advances in anesthesia and resuscitation have contributed to a decrease maternal and fetal mortality and morbidity. The situation in developing countries remains worrying due to the limited technical platform, the insufficient number of anesthesia practitioners and the prevalence of emergency [1-3].

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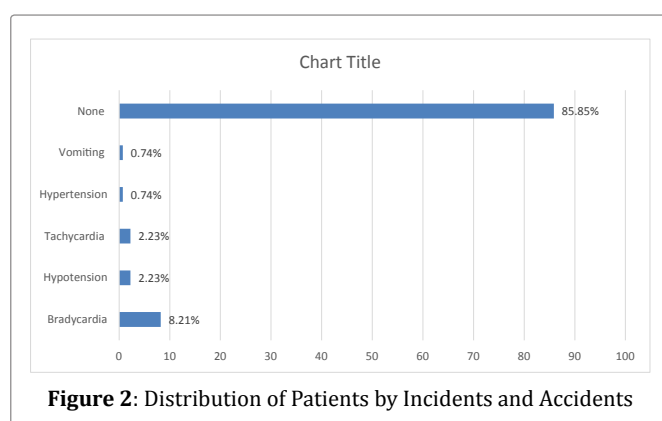
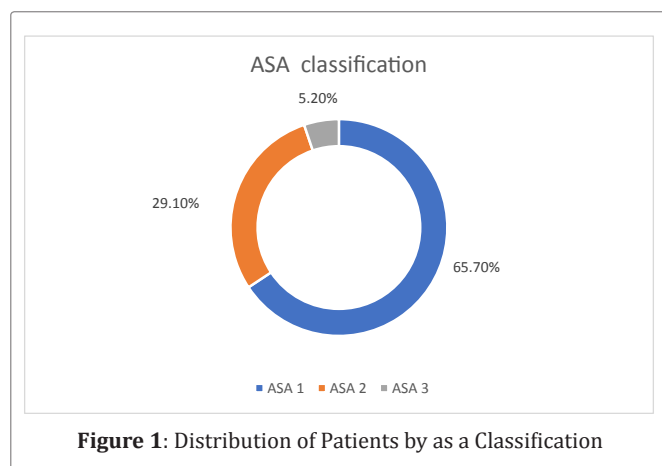
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Caesarean indications	Number of patients	Percentage (%)
Scar uterus	68	25,37
Third trimester hemorrhage	50	18,65
Eclampsia	38	14,18
Presentation anomalies	22	8,20
Stationary expansion	20	7,47
Pelvic anomalies	16	5,97
Fetal suffering	10	3,75
Others	44	16,41
Total	268	100

Table 1: distribution of patient by caesarean indications

Patients and Methods

A prospective, multicentric, descriptive study was conducted in the obstetric centers of Niger Republic (9 maternity and 23 district hospitals) during one week. The study was approved by faculty of medicine, Abdou Moumouni University of Niamey and obtaining an informed consent from the patients. Was included in the study, all parturient admitted to the operating room for caesarean surgery in emergency or elective in public hospitals. The following variables were analyzed: age, indication of caesarean, Mallampatiscore, American Society of Anesthesiologists (ASA) physical status classification, preoperative prescriptions, delay of the surgery, technique of anesthesia used, incidents and accidents, post-operative prescriptions and evolution, anesthetist qualification, incidents and accidents, mortality, post-operative follow-up was one week. Data were analyzed with Epi Info 6™ (Centers for Disease Control and Prevention Atlanta, GA).

Results

In this study, 802 surgical procedures were performed, including 268 cesareans (33.41%). The average age was $26,8 \pm 9,05$ years,

ranging from 15 to 44 years. 27.60% had a cesarean history. For Mallampatiscore; 82.80% of the patients were classified Mallampati 1; 17.20% of Mallampati 2. For anesthesia risk; 65.70% of the patients were classified as ASA class 1; 29.10% ASA class 2 and 5.20% of them ASA class 3 (Figure 1). Surgery was urgent in 88.10%. The main indications were: scar uterus (25.37%), third trimester hemorrhages (18.65%) and eclampsia (14.18%) (Table 1). Spinal anesthesia was performed in 67.20%, general anesthesia was used in 32.80% of cases. Anesthesia has been done by an anesthetist nurse only in 73.89%, with anesthetist assistance in 26.11%. Spinal anesthesia was done with bupivacaine associated with fentanyl (71.60%) and morphine (28.40%). For induction of general anesthesia, the intravenous narcotics used were ketamine in 62.50% of cases and thiopental in 37.50% of cases. The maintenance of anesthesia, halothane was the most commonly used halogen. Fentanyl was the only available used narcotic. The most common incident was bradycardia (8.21%) followed by hypotension in 2.23% of cases (Figure 2). For patients who received general anesthesia; 22.72% have complications compared to 10% in the group spinal anesthesia. For the newborns 89.60% were alive and 10.40% born dead. Multimodal analgesia was used in 79.10% of patients and 20.90% of patients received paracetamol only. Postoperative complications happened in 19.77% of cases were dominated by anemia and abdominal wall infection (Table 2). The average hospital stay was $4.61 \text{ days} \pm 1.63$ and the mortality was 2.20%.

Discussion

During the study period 268 caesarean sections were performed on 802 surgical procedures (34.41%). This frequency is comparable to that obtained by Binam F et al. [4] who found 33.30%. It is superior to that of Alain K et al. [5] who reported 29.20%. However, it is lower than the results of 40.05% [4-6]. The average age was 26.8 ± 9.05 years. This average age is comparable to that obtained by Essola et al. [7] and Tshabu-Aguèmon et al. [8] with 26.80 years and 26.60 years respectively. It is lower than that of Pete et al. [9]. (29.10 years) [7-9]. This is explained by the early nature of marriages; according to 2005 WHO report on health and development, Niger Republic has the highest synthetic fertilization index in the world and under 15 years account for 50.23% of the general population [10]. Patients were classified as ASA 1 in 82.80% of cases. This result is lower than that of Essola et al. [7] who reported 54.30% for the ASA 1 class. This predominance of this class could be explained by the high number of young subjects in this study, usually without co morbidities. Caesarean section was performed in an emergency setting in 88.10% of cases. Other African studies have found a predominance of emergency caesarean section [3,7,9]. Indications were scar uterus with 25.37%, third trimester hemorrhage with 18.65% and eclampsia; 14.18% Beye et al. [3] reported that indications of cesarean section were dominated by foeto-pelvic disproportion with 27%, followed by abnormal presentation with 19% and scar uterus with 15.60% [3]. The choice of anesthetic modality for caesarean section depends on the degree of emergency; mother's and fetus's condition. Spinal anesthesia was the anesthetic technique performed in 67.20% of cases compared to 32.80% for general anesthesia [9] with 79, 40% and 86.10% respectively for spinal anesthesia [9,711].

Complications	Number of patients	Percentage (%)
Anemia	29	10,83
Abdominal wall infection	12	4,47
Hypertension	8	2,98
Urinary tract infection	2	0,75
Abdominal pain	2	0,75
None	215	80,22
Total	268	100

Table 2: Distribution of Patients by Post-Operative Complications

Carpentier [12] reported that spinal anesthesia was the most widely used technique with a frequency ranging from 48.90 to 68.70% under-equipped centers [12].

Indications of general anesthesia have changed; this technique remains appropriate for the management of caesarean sections of extreme emergency. General anesthesia has a higher risk of mortality than other anesthetic techniques. Difficulties in controlling the airways and bronchial inhalations are responsible for the majority of maternal deaths. Spinal anesthesia is of particular interest [13]. Bupivacain was used for spinal anesthesia. Ketamine was the hypnotic of choice for induction into general anesthesia (62.50%). Maintenance for general anesthesia was done by halothane (56.81%). Our results are comparable to those of Beye [3] and Essola et al. [7] reported that bupivacaine was used in 79.90% and ropivacaine; 21.20% of cases. [3,7]. For general anesthesia induction thiopental, propofol and ketamine were used in 53.50%, 35.10% and 11.10% respectively. This choice is due to the availability, cost and pharmacological benefits of these products. Ketamine is also the drug of choice in case of shock. Adverse events that are involved in surgery must be detected and managed early to safeguard the life of the fetus. The intraoperative adverse events encountered were dominated by bradycardia (8.21%), tachycardia (2.23%), and hypotension (2.23%). Our results are different from those of Beye et al. [3] who found hypertension (42%), tachycardia (35.40%) [3]. Adverse events were more common during general anesthesia. The occurrence of hypertensive thrust and tachycardia during general anesthesia usually indicates a deficiency of analgesia. Hypotension and bradycardia are the most described for spinal anesthesia. The management of adverse events must be early and adopted in order to reduce fetal impact. Anesthesia was performed by the anesthetist nurses only in 73.89%, this is related by the inadequacy of anesthetists in South Saharan Africa countries imposing a delegation of power to the anesthetist nurses [6,12,14]. Postoperative analgesia was multimodal in the majority of cases, the non-use of morphine, this was found by other studies. [7,15,16] Mortality was 2.20%; [17]. Imbert P [17] found 1.90%; 0.90%. [9,17]. This result is lower than that of Tshabu-Aguèmon with 4.55% [8]. These deaths occurred in district hospitals where there is one anesthetist nurse.

Conclusion

Caesarean section plays an important role in obstetric practice, requiring the emphasis on anesthetic difficulties. The proper practice of caesarean section involves setting up a good technical anesthetic tray, raising awareness of the parturient in order to consult on time and training staff in order to reduce anesthesia complications.

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