

Prevalence and Complications of Obesity in Surgical Patients: A Multicenter Study in Benin, a Sub-Saharan African Country

Eugene Zoumenou¹ *, Emile Mensah² , Francis Dossou³ , Mignagnal Kaboro⁴ , Annelie Kerekou⁵ , Blaise Tchaou⁶ and Martin Chobli

¹Emergency Department, Teaching Hospital Cotonou

² Department of Surgery, Teaching Hospital Parakou

³ Department of surgery, Teaching Hospital Cotonou

⁴ Department of Anesthesia and Intensive care, Teaching Hospital N'Djamena

⁵ Department of Endocrinology, Teaching Hospital Cotonou

⁶ Department Anesthesia and Intensive care, Teaching Hospital Parakou

Abstract

Obesity is a growing healthcare problem worldwide [1,2]. The anesthetic management of obese for surgery is no longer rare and has become frequent in the last two decades. Therefore, the challenges of anesthesia in this high-risk group will have to be met by all anesthetists. Obese patients may be more prone to complications in the perioperative period. The increasing phenomenon of obesity exists in Benin, a Sub-Saharan African country [3]. However, no study has been performed in Benin to find out the prevalence, management and perioperative complications of obese patients requiring surgery and anesthesia. The aim of this study was to provide characteristics of an obese population that underwent anesthesia and surgery in a West African country. **Patients and Methods** This prospective and multicenter study was conducted in six teaching or regional hospitals in Benin. Consecutive patients presenting for surgery and anesthesia over a four months period (December 2010 to April 2011) were screened. The centers involved in the study were either public or private hospitals in Benin recognized for having a high volume of surgical activity. Bembereke hospital and Djougou hospital are located in the northern regions of Benin. Zou-Collines hospital is in the central region. Oueme-Plateau hospital, Mono-Couffo hospital and the teaching hospital of Cotonou are in the southern region. Local ethics committee of the hospitals approved this study. Power analysis revealed that a sample size of about 3271 patients would be required to determine the

prevalence of obesity using the Schwartz formula: $N = P(1-P) Z_{\alpha/2}^2 / d^2$ laryngoscopy. Failed intubation was considered when the placement of endotracheal tube fails after multiple intubation attempts [5]. The follow up time covered intra operative period and at least the first 48 hours postoperatively. Difficult spinal was defined as at least three attempts before successful lumbar puncture. Statistical analysis was performed using Epi-info 3.2. Statistical significance was ascertained using the χ^2 -test and p value was set to $p = 0.05$.

Keywords: Obesity; Anesthesiology; Surgery; Outcomes

Results

Prevalence of obesity

During the study period, 3971 required surgery and anesthesia. There were 2826 women and 1145 men. BMI ≥ 30 was found in 384 patients. The prevalence of obesity in this population was 9.67%. Prevalence of obesity was higher in women (11%) than in men (6%). The difference was significant ($p < 0.05$).

Obese patient's demographics

The Mean age was 41 years ± 15 with extremes from 17 to 75 years. The mean BMI was 34.77 ± 3.38 . Moderate obesity was found in 66% patients; severe obesity in 30% and morbid obesity in 4%. There were no super-obese patients. Obese patients were operated for obstetrics (57%), for abdominal surgery (20%), for gynecologic surgery (13%), orthopedic surgery (8%), urologic surgery (1%) and ENT surgery (1%). Emergency cases were 55%. Bariatric surgery was not performed in any patients. ASA2 score was found in 79% patients and ASA3 in 21%. Difficult

intubation was predictable in 23% patients (Mallampati scale ≥ 3).

Anesthetic management in obese patients

Intra operative monitoring consisted of non invasive blood pressure for all patients. Pulse oxymeter was used in 97% patients. ECG monitoring was used only in 3% patients. Capnography and residual muscle paralysis were not monitored in any of the patients. Spinal anesthesia was the most widely used technique (80%) (Table 1). Lumbar puncture was difficult in 15% patients and failure of spinal anesthesia was observed in 2% patients requiring conversion into general anesthesia. Seventy five patients had general anesthesia and tracheal intubation was performed in 71 patients. Anesthesia was induced using Thiopental (76%), Ketamine (15%) or Propofol (9%). Intubation was facilitated by Suxamethonium (76%), Pancuronium (16%) or the Rocuronium (3%). Difficult intubation occurred in 20% patients. Among patients under general anesthesia, ventilation was either manual (67%) or spontaneous (21%). Only 12% patients under general anesthesia had controlled ventilation.

Postoperative care

Postoperatively, 46% of the patients were admitted in intensive care and 14% into recovery room. Forty percent of the obese patients were directly admitted into the surgical ward. Postoperative management consisted primarily of oxygen delivery to all patients, analgesia (84%). Venous Thromboembolism prevention consisted of early mobilization in 86% and low-molecular-weight heparin (LMWH) was used in 21%. Postoperative non invasive ventilation was used only in 2 patients after general anesthesia. No obese patient had postoperative respiratory physiotherapy.

Perioperative complications

Perioperative complications were observed in 67 patients (16%). There were cardiovascular complications (24 cases), respiratory complications (23 cases) or neurological complications (16 cases). The complications were more frequent during general anesthesia (26/75) than spinal (41/213) and difference was significant ($p < 10^{-6}$). Incidence of complications increased with increased BMI (Table 2). We observed two intraoperative deaths all related to emergent obstetrical patients.

The first death was due to a severe postpartum hemorrhage. The second death occurred after a failed intubation during a general anesthesia for an emergent cesarean section. General anesthesia was indicated because the patient was shocked and unconscious.

Discussion

This prospective observational study was not a national survey nor a comparative study in obese and non obese patients. However, it covered a representative sample of the anesthetic practice in Benin. The prevalence of obesity in surgical patients in our study was 9.67%. This prevalence was comparable with the prevalence of obesity in the general population in Benin [3]. The prevalence found in our study was lower than that found by Dindo et al. [6] in a study involving 6336 surgical patients. The prevalence of obesity was 13%. Irrespective of this finding, obesity may constitute an important concern for anesthetists in Benin. The higher female prevalence of obesity seen in this study has been reported in many studies.

Conclusion Obesity is a concern for anesthetists in Benin although its severity may be less than that reported in literature. Perioperative complications are frequent. Main risk factors identified in this study were increasing BMI, general anesthesia and obstetrics.

Email: ezoumenou@yahoo.fr