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Research Article

Reality about Anesthetic Practice in the University Hospital Morafeno Toamasina of Madagascar

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Abstract

Introduction: In Madagascar, particularly in the Atsinanana region, there are no recent data providing information on compliance with anesthesia recommendations. This motivated us to carry out this work whose main objective is to describe anesthetic management in our current practice and discuss it against the recommended standards.

Materials and Methods: Through a descriptive cross-sectional, monocentric observational study involving all patients hospitalized in the Morafeno Hospital Surgical Department for a 21-month period from January 2016 to September 2017. Among all the patients seen in pre-anesthesia consultation, only those patients who were anesthetized and benefited of a surgical procedure were included. The variables studied were demographic characteristics, prevention of postoperative nausea and vomiting, antibiotic prophylaxis, preoperative assessment, surgery, anesthetic management.

Results: A total of 294 cases were selected with an average age of 45.3 years. The sex ratio was 2.3. Only 72 patients (24.5%) had received weight measurement during the pre-anesthesia consultation and 194 patients had taken heart rate. One hundred and seventy-seven patients (60.2%) had no medical history. Arterial hypertension, diabetes, allergy, epigastralgia and asthma were found in 26.2% (n = 67), 8.5% (n = 25), 12.2% (n = 36), 5.4% (n = 16) and 5.1% (n = 15) of the cases. Thirty-four (11.6%) patients had a surgical history. Forty-seven patients (16%) were smokers and 65 patients (22.1%) were ethyl. As a preoperative assessment, the hemogram and the balance of haemostasis were the most frequently prescribed. CPR and ECG were achieved in only 11.9% (n = 35) and 15.3% (n = 45), respectively. According to the classification of the American Society of Anesthesiology (ASA), 71.8% (n = 220) of the cases were classified ASA I. The surgery was scheduled in 77.9% (n = 229) of the cases. Before anesthetic induction, eighty-three patients (28.2%) had received postoperative nausea and vomiting prevention. Before the surgical incision, one hundred and fifty patients (51%) had received antibiotic prophylaxis. Regarding the type of anesthesia our patients had benefited from a general anesthesia in 46.6% (n = 137), a locoregional anesthesia that is to say spinal anesthesia or epidural anesthesia in 41.5% (n = 122), axillary blockade ultrasound-guided in 8.8% (n = 26) and sedation or conversion to general anesthesia after failure of locoregional anesthesia in 3.1% (n = 9) cases. All our patients were awake on the table.

Conclusion: A multitude of factors affect our current practice in the non-application of recommendations, including the unavailability of certain products. This work will serve as a reference database for our subsequent practice.

Keywords: *Routine Practice; Recommendations; Anesthetic Management; General Anesthesia; Locoregional Anesthesia; Postoperative Nausea and Vomiting; Antibiotic Prophylaxis*

Introduction

The progress of anesthesia in recent decades not only ensures the care of heavy surgeries and fragile patients but also confer maximum safety in anesthesia in industrialized countries with advanced medical technology [1]. This prodigious development is mainly linked to the mastery of physiopathological and pharmacological bases as well as to innovation in terms of the technical platform. Anesthetic practice is governed by laws and follows standards [2]. In Africa a multitude of problems including a deficit in terms of material resources and a shortage of qualified personnel [3,4] does not allow the application of these recommended standards for anesthetic management. This fact has a considerable influence on the increase in insecurity, morbidity and mortality associated with anesthesia [5,6]. According to a preliminary investigation carried out in the Academic Hospital of Analakininina Toamasina, the same problems were raised [3]. In Madagascar, particularly in the Atsinanana region, there are no recent data providing information on compliance with anesthesia recommendations. This motivated us to carry out this work whose main objective is to describe the anesthetic management within the Morafeno Toamasina University Hospital Center and to discuss it against the recommended standards.

Materials and Methods

We performed a single-center observational cross-sectional descriptive study on all hospitalized patients in the Morafeno Hospital Surgical Department for a 21-month period from January 2016 to September 2017. Among all patients seen in pre-anesthesia consultation, only those patients who were anesthetized and benefited from of a surgical procedure were included. The variables studied were frequency, demographic characteristics (age, gender, antecedents, weight, blood pressure, heart rate), prevention of postoperative nausea and vomiting, antibiotic prophylaxis, preoperative assessment (biological, electrocardiographic examination, chest x-ray), surgery (degree of urgency, type), anesthetic management (type, products used), anesthetic recovery. The data was collected, grouped, entered on Microsoft Excel 2013 and then processed using the epi-info software 7. The results are expressed in percentage (%) and in number (n).

Results

Between January 2016 and September 2017, 310 patients had been hospitalized in the surgical ward at Morafeno Toamasina Hospital, 297 patients had been seen in pre-anesthesia consultation and 294 had undergone surgery (Figure 1). The average age was 45.3 years old. The age of the patients was between 3 months and 87 years old. Patients over the age of 30 accounted for 74.8% (n = 240) with a significant percentage of patients over age 60, or 28.2% (Table 1). The male gender represented 69.7% (n = 205). The sex ratio was 2.3. Only seventy-two patients (24.5%) had received weight measurement during the pre-anesthetic consultation. The minimum weight was 10 kg and the maximum weight was 80 kg with an average weight of 54.5 kg (Table 2). During CPA, 194 patients had had heart rate and 42 had tachycardia (Table 3). One hundred and seventy-seven patients (60.2%) had no medical history. Arterial hypertension, diabetes, allergy, epigastralgia and asthma were found in 26.2% (n = 67), 8.5% (n = 25), 12.2% (n = 36), 5.4% (n = 16) and 5.1% (n = 15) of the cases. Thirty-four (11.6%) patients had a surgical history. Forty-seven patients (16%) were smokers and 65 patients (22.1%) were ethyl. As a preoperative assessment, the hemogram and the hemostasis balance were the most frequently prescribed, with 48.6% and 41.8% of the prescriptive percentages (Figure 2). Chest x-ray and electrocardiographic examination were achieved in only 11.9% (n = 35) and 15.3% (n = 45), respectively. According to the American Society of Anesthesiology classification, 71.8% (n = 220) of the cases were ASA I patients (Table 4). Surgery was scheduled in 77.9% (n = 229) of the cases and was primarily involved in urological and traumatic surgery with 31.6% (n = 97) each (Table 5). Before anesthetic induction, eighty-three patients (28.2%) had received postoperative nausea and vomiting prevention. In 88% (n = 73) of the cases, dexamethasone was the molecule used. Anti-serotonergic drugs were only used in 3.6% of cases (n = 11).

Age (year)	Number (N = 294)	Percentage (100%)
0 to 15	32	10,9
16 to 30	42	14,3
31 to 45	73	24,8
46 to 60	64	21.8
61 to 87	83	28,2

Table 1: *Breakdown by age group.*

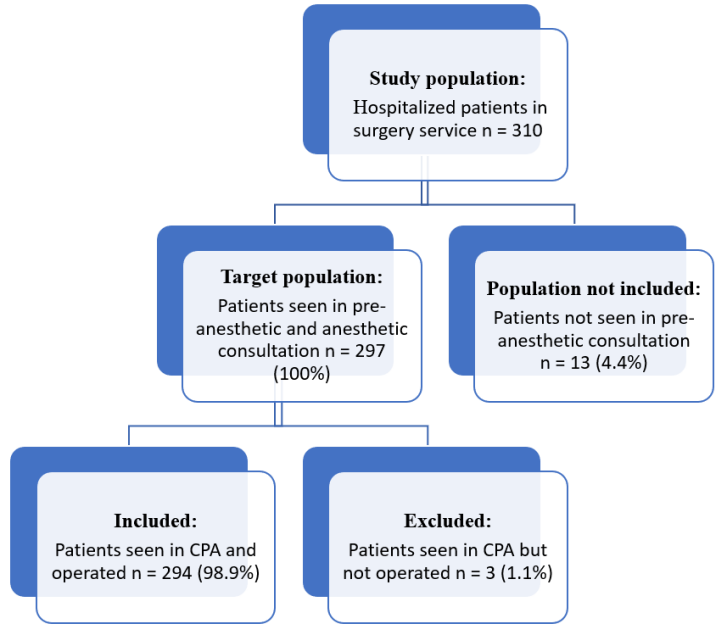

Figure 1: *Patient selection mode.*

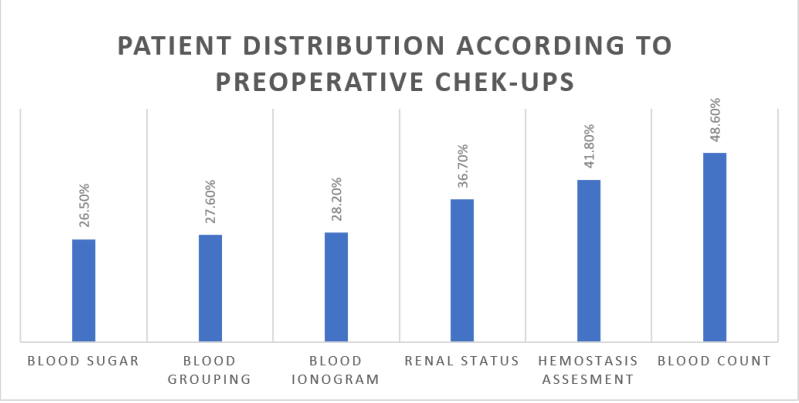

Figure 2: *Distribution of patients according to the pre-operative balance.*

Weight (kg)	Number (n = 72)	Percentage (100%)
< 30	06	8
30 to 60	37	51
60 to 80	24	34
> 80	5	7

Table 2: *Breakdown by weight.*

FC	Number (n = 194)	Percentage (100%)
< 50	24	12,36
50 to 90	128	66
> 90	42	21,64

Table 3: *Distribution of patients according to heart rate.*

ASA Class	Number (N = 294)	Percentage (100%)
ASA I	204	74,8
ASA II	59	20,1
ASA III	15	5,1

Table 4: *Breakdown of patients according to ASA class.*

Type of intervention	Number (N = 294)	Percentage (100%)
Neurosurgery	15	5,1
Vascular Surgery	31	10,5
General Surgery	58	19,7
Trauma	93	31,6
Urological surgery	97	31,6

Table 5: *Distribution of patients according to the type of intervention.*

Only one patient had received the combination of the two molecules. Before the surgical incision, one hundred and fifty patients (51%) had received antibiotic prophylaxis. In 91.3% (137) of the cases, beta-lactams, mainly third-generation cephalosporins, were used. Regarding the type of anesthesia our patients had benefited from a general anesthesia in 46.6% (n = 137), a locoregional anesthesia that is to say spinal anesthesia or epidural anesthesia in 41.5% (n = 122), axillary blockade ultrasound-guided in 8.8% (n = 26) and sedation or conversion to general anesthesia after failure of locoregional anesthesia in 3.1% (n = 9) cases. For the 137 patients who received general anesthesia, while fentanyl in 78.6% (n = 108) of cases was the analgesic agent of choice, the hypnotic of choice was propofol 86.1% (n = 108). 118). Pancuronium was the only curare available in our center used in 12.2% (n = 17) of the cases. No patient even emergencies had succinylcholine (Table 6). One hundred and fifty-seven patients had benefited from local anesthetic products. Bupivacaine was the most used molecule in 82.2% of cases (n = 129). Xylocaine adrenaline was associated with bupivacaine for ultrasound-guided axillary blockage and epidural anesthesia. All our patients were woken on the table due to a lack of staff in the post-intervention ward. There were no cases of delayed recovery or major postoperative complications inherent in the anesthetic procedure. However, intensive care anesthetists had been called indoors for rare cases of post-spinal anesthesia headache and postoperative nausea and vomiting.

Products	Number (n)	Percentage (%)
Hypnotic		
Propofol	118	86,1
Ketamine	5	3,7
Nesdonal	1	0,7
Halothane	13	9,5
Analgesic		
Fentanyl	108	78,6
Myorelaxant		
Pancuronium	17	12,2

Table 6: *Distribution of patients according to general anesthetic products.*

Discussions

Our study was carried out on a population of average age of 43.5 years with a significant percentage of patients over 60 years is 28,2%. If we refer to the average age, this result is comparable to that of a monocentric study, retrospective on the anesthetic practice done in Brazzaville, which is 44.2 years old, but differs from that of Togo, which is much lower than order of 19.38 years. Age greater than 60 years involved 28.2% of our patients. Compared to the results found in African studies on anesthetic practice, particularly in Morocco in 2002 and in Madagascar in 2010 with respective values of 15% [7] and 18.75% [3], the number of elderly subjects over 60 years was more significant in our study. Indeed, the Morafeno University Hospital is a reference center in urological surgery, serves the entire Atsinanana region and receives all patients with urological diseases especially prostatic encountered in the elderly [8]. The predominance of the male gender (69.7%) in our work is due to the importance of the anesthetic activity in traumatology, consequences of road accidents, traffic accidents, accidents at work and in urology related to the large number of elderly people to benefit from prostatic surgery and the high incidence of sexually transmitted infections in our region. This result is identical to that of Lumbumbashi in 2013 (67.8%) [9]. During the pre-anesthesia consultation, all our patients had taken a blood pressure test. Heart rate was noted in 66% of cases and only 24.5% of our patients had received a body weight measurement. These figures reflect a certain failure in preoperative management because a significant proportion of our sample had not benefited from a measurement of all vital parameters. The values given when taking these parameters are very important because of the latter, the dosage and the choice of pharmaceutical products used perioperatively [10,11]. For medical history and toxic habits, one hundred and seventy-seven patients (60.2%) had no medical history. The results of our study show that 39, 8% had comorbidities mainly represented by arterial hypertension 26.2% (n = 77), diabetes 8.5% (n = 25), allergy 12.2% (n = 36), epigastralgia 5.4% (n = 16), asthma 5.1% (n = 15), smoking 16% (n = 47) and alcoholism 22.1% (n = 65). In other African countries, these co-morbidities were also reported but with varying percentages. These differences in numbers are due to the young age and the toxic habit of their study population. For the Lomé University Hospital, hypertension, anemia, diabetes and asthma were found in 35%, 21%, 13.7% and 1.45% of cases respectively, with a low smoking rate (5%). 8%) and high alcoholism (44.9%) [12]. Preoperatively, about 40% of our patients had both a blood count, a haemostasis report and a kidney assessment. A study carried out in a university hospital in Bicêtre on prescribing pre-operative checkups [13] shows a trend towards similarity in the prescribing frequency of the hemogram and the hemostasis balance. Chest x-ray and electrocardiographic examination were achieved in 11.9% (n = 35) and 15.3% (n = 45) of the cases. This figure reflects the will of our practitioners for a reasoned and non-exhaustive prescription because Chest x-ray is not mandatory, whatever the age of the patient, except in case of evolutionary or acute pulmonary pathology and in case of cardiothoracic surgery. Nevertheless, a failure was observed in the prescription of the electrocardiographic examination in 15.3% of cases (n = 45). This prescription rate is much lower compared to the number of patients exceeding sixty or 28.2%. It should be noted that after 65 years, a resting electrocardiographic examination is desirable before any high-risk or intermediate intervention even in the absence of clinical signs, risk factors and / or cardiovascular pathologies [14]. At the end of the preoperative evaluation, the majority of patients were ASA class I and II (94.9%). This figure is identical with that of most African countries such as Morocco, Lumbumbashi, Brazzaville with respective values of 97%, 91.9%, 98% [7,9,15]. Surgery was scheduled in 77.9% (n = 229) of the cases. The newly implanted surgery and operating theater department had only 65 cases in the study period, or 23.1% of surgical emergencies. At the Dakar in 2016, one study had observed roughly the same results with 20% of cases of surgical emergency [16]. Before anesthetic induction, Eighty-three patients (28.2%) had received prevention of postoperative nausea and vomiting. In 88% (n = 73) of the cases, dexamethasone was the molecule used. According to our results, only a well-targeted group of patients guided by the Apfel score had benefited from prevention of postoperative nausea and vomiting. Dexamethasone, a common and inexpensive medication, is recommended [17-19]. Its efficacy is close to that of the serotonin 5-HT3 (hydroxytryptamine) receptor antagonists or setrons which are current references [20]. The gold standard for high-risk patients is the combination of two antiemetics such as dexamethasone and setrons [20]. Before the surgical incision, one hundred and fifty patients (51%) had received antibiotic prophylaxis. This frequency is explained by the fact that antibiotic prophylaxis was reserved for interventions with a significant risk of infection in incidence or severity [21]. In 91.3% (137) of the cases, beta-lactams were used. Our result is similar to that of the authors who used betalactamines monotherapy in 84.1% of cases [22]. The beta-lactam that we used was the third-generation cephalosporin due to the lack of first generation and second generation cephalosporins, among others cefazoline and cefamandole, which are the reference molecules for preoperative antibioprophylaxis. in urological, cardiovascular, orthopedic, traumatological and neurological surgeries [23]. The difficulty of accessibility to these molecules prompts us to opt for the

third generation cephalosporin as in a study conducted in Jordanian hospitals which also shows a majority use of third generation cephalosporin with 31% of cases against only 18% using first generation cephalosporin [24]. Regarding the type of anesthesia, there was no noticeable difference between the frequency of general anesthesia and locoregional anesthesia, i.e. 46.6% versus 50.3%. A 2014 study in Congo on the evaluation of anesthetic management in urological surgery showed a preference for locoregional anesthesia with a rate of 68.7% [25]. Unlike our choice was not influenced by the type of surgery but especially the awareness of the main benefits of the locoregional anesthesia and the application of recommended standards. Noting that twenty-six patients had undergone axillary ultrasound-guided blockage, which is currently the standard anesthetic technique for the fabrication of arteriovenous fistula [26]. Intraoperatively, for intravenous hypnotics, propofol was used in 86.1% of cases, ketamine in 3.7% of cases and nesdonal in 0.7% of cases. We do not have etomidate. Unlike those described in many third world countries, propofol has been used in the majority of our patients. Only one patient in our study had received thiopental. A study done in Brazzaville in 2014 showed a propofol utilization rate comparable to that of thiopental with 49.4% versus 44.8% [15]. In developing countries such as Africa and Madagascar, thiopental still plays a fairly important role during anesthetic induction because of its characteristics: low cost, easy preservation, safety of use and, if not others, anesthetic products [27,28]. Less and less used in developed countries as a hypnotic agent [29], thiopental still finds its place in the management of the state of convulsion or intracranial hypertension, refractory to initial therapy in intensive care. Only 5 shocked patients had benefited from Ketamine in our series. It has been shown that induction doses of etomidate, a much newer product comparable to ketamine during rapid-sequence intubation, cause transient adrenal suppression [30], which is why ketamine is still the ideal molecule for emergency surgery requiring rapid-sequence induction [31] in hemodynamically unstable patients. As an inhaled hypnotic, halothane was the only agent available. Its use was strictly reserved in children for anesthetic induction, with a rate of practice of 9.5%. The reference halogenated gas in children is currently represented by sevoflurane thanks to the favorable cardiorespiratory tolerance it develops [32]. As an analgesic agent used for induction and maintenance, fentanyl was used in 45.9% of cases in the absence of sufentanil and other recent molecules such as remifentanil, alfentanil in our hospital. A study carried out in the Lomé University Hospital on the anesthesiological aspects of intracranial meningioma surgery had shown the importance of fentanyl use at a rate of 76.2% compared to sufentanil accounting for only 23.8% [33]. Pancuronium was the only non-depolarizing long-acting curare available in our hospital, used in 12.2% of cases. This low rate of use is explained by the fact that we limit its prescription only to interventions requiring absolutely a total muscular relaxation. Moreover, its manipulation imposes a systematic monitoring by a curarometer which is an apparatus not available in our service in order to better adapt the curarization to the needs of the operative act and to reduce the residual effects [34]. In France, the most used nondepolarisers are atracurium (49%) and cisatracurium (44%) [35]. In locoregional anesthesia, bupivacaine was the most used molecule in 82.2% of cases (n = 129). Xylocaine adrenaline in 15.9% of cases was associated with bupivacaine in epidural anesthesia and for axillary ultrasound-guided blockade. However, ropivacaine currently appears to have the greatest safety margin among all long-acting local anesthetics [36]. The use of xylocaine adrenaline appears to be justified in our current practice because it is comparable to Mepivacaine (Carbocaine®) in terms of its delay, short duration of action and lower toxicity [37].

Conclusion

This work made it possible to identify in particular the strengths of our anesthetic management but also and above all the deficiencies and deficiencies with the different parameters making obstacles to application of the recommendations. In general, the faults observed during our anesthetic practice are mainly represented by drug deficiency (Sevoflurane, Sufentanil, Succinylcholine, Cefazolin, Cefamandole), in medical equipment (curarometer, weigh scale, echogenic needle for neurostimulation). Despite these flaws, we still provided anesthetic management of heavy patients and practiced axillary blockade ultrasound with the available technical platform. This book will serve not only as a data bank but also as a benchmark in the evaluation of our subsequent performance in the field of anesthetic management within the hospital.

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