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Original Research Article

Anesthetic Management of Pediatric Surgical Emergencies at the Peace Hospital of Ziguinchor

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Abstract: ***Introduction*:** Pediatric anesthesia requires, however, both a material and human environment adapted to very varied situations. ***Objective***: Evaluate the anesthetic management of pediatric surgical emergencies. ***Patients and Methods*:** This is a retrospective, descriptive and analytical study conducted from January 2022 to June 2024. We included patients aged from 0 to 15 years who were admitted for a surgical emergency. ***Results*:** We collected a sample of 154 operated patients, representing a prevalence of 6.7%. The sex ratio is 2.85. The age group of 10–15 years was the most represented in 37.7% of cases. The average age was 6.96 years with extremes of 4 days and 15 years. The main diagnoses were traumatic in 29.2% followed by skin infections in 18.2% and foreign bodies in 16.2%. The children were classified ASA 1U in 98.7%. General anesthesia was performed in 85.8%. Anesthetic induction was mostly performed by IV route in 98% of the patients and sevoflurane was the only halogen used. The administration of paracetamol alone was most used for post-operative analgesia in 76.7% of patients followed by the combination of paracetamol and tramadol in 18.9%. Laryngospasm was the only complication found intraoperatively in 0.64%. We deplored a peroperative death, which is a mortality rate of 0.64%. ***Conclusion***: The practice of pediatric emergency anesthesia poses organizational difficulties in most of our hospitals.

Keywords: Pediatric Surgical Emergency, Pediatric Anesthesia, Traumatology, Peace Hospital of Ziguinchor.

INTRODUCTION

Pediatric surgical emergency can be defined as a situation occurring in an age group between 0 and 15 years requiring appropriate emergency surgical care as the sole management option to save life, avoid and/or minimize disability or palliative care [1]. All these surgical emergencies require perioperative anesthetic management. Pediatric anesthesia remains an anxiety-inducing discipline for anesthetists [2]. It requires, however, both a material and human environment adapted to very varied situations. Covering birth to adolescence, the pediatric anesthesiologist supports newborns (0-28 days), infants (1-24 months), preschoolers (3-6 years) and school-aged children (7-15 years) [3]. Its practice therefore requires knowledge of the anatomical and physiological particularities in children due to the fact that they are not a miniature adult. In France, an epidemiological study on the practice of pediatric anesthesia showed that 29% of pediatric surgical emergencies were of ENT origin, 21% digestive origin and 14% orthopedic origin [4]. In Africa, more particularly in Senegal, the assessment of activities of pediatric surgical emergencies at the Principal Hospital of Dakar showed that the group of traumatic pathologies was predominant with 46.8% of cases followed by the group of digestive/parietal pathologies with 35% [5]. In anesthetic practice, studies have shown that general anesthesia is the most used technique in children followed by spinal anesthesia with regard to regional anesthesia [5, 6]. This is particularly important in low- and middle-income countries as it is estimated that 85% of children in these countries will develop a potentially surgically treatable condition before the age of 15 [7]. Moreover, in almost all African countries, this specialty is thus practiced in services dedicated to adults with staff (medical and paramedical) who works with both children and adults because they do not have a specific hospital or service for the practice of pediatric anesthesia [8]. In Ziguinchor, the anesthetic practice for children in emergency has not yet been studied. The lack of anaesthetic data on surgical emergencies in pediatrics led

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us to initiate this study whose general objective is to evaluate the anaesthetic management of pediatric surgical emergencies.

PATIENTS AND METHODOLOGY

We conducted a retrospective, descriptive and analytical study covering a 30-month period from January 2022 to July 2024. We included all the children from 0 to 15 years old who were operated on urgently at the Ziguinchor Peace Hospital. We studied the following parameters.

- Pre-operative: epidemiology (age, sex, origin, field, history), diagnosis, paraclinical results, type of intervention
- Per-operative: anesthetic techniques, course of anesthesia, incidents–accidents
- And post-operative: awakening, multimodal analgesia and evolution.

The software Epi Info version 7.2.2.6 and SPSS version 20.0 were used for data analysis. The text processing of tables and figures was carried out using Microsoft Word and Excel 2016 software. The quantitative data were expressed in terms of their unit of measurement and at one digit after the decimal point. The statistical test used was the Chi2. It was significant for p-value values below 0.05 (5%).

RESULTS

At the end of the collection, 154 patients were recorded during the study period, an incidence of 6.7%. The sex ratio was 2.85. The average age was 6.96 years with extremes of 1 day and 15 years. The median was 7 years. Half of the patients, or 50%, were aged between 2 and 12 years. The most represented age group was that of children aged 10 to 15 (37.7%) followed by the age group 1 to 4 years with 23.4% and the age group 5 to 9 years with 20.8%.

A particular terrain was found in 3.2% of the patients. Among the latter, sickle-cell anaemia was the most common condition in 40% of cases. The most frequent pediatric surgical emergencies were orthopaedics in 33.8% followed by parietal/digestive surgery in 21.4% and ENT in 19.5%. However, the most frequent diagnoses were dominated by traumatology in 29.2% of cases followed by skin infections in 18.2% and foreign bodies in 16.2%. The hemoglobin level was reported in 62.33% of children with an average of 11.14 g/dl with extreme values of 4.90 and 18.50 g/dl. The platelet count was reported in 59.74% of patients with a mean of 409 207/mm^3 (± 200 939.7), a median of 376 500/mm^3 and extremes of 77 000 and 1 091 000/mm^3. We found thrombocytopenia in 8.7% of the children. White blood cells were reported in 59.74% of patients with a mean of 13 304/mm^3 (± 6 508,54), a median at 12 285/mm3 and extremes of 1 700 and 35 600/mm3. We found hyperleukocytosis in 63% of the patients. TP was reported in 49.35% of patients with a mean of 85.11% (± 55.93), a median of 79% and extremes of 29% and 100%. It was low in 14.5% of patients. CRP was reported in 27.27% of patients. The majority, 76%, had a positive CRP. In children with positive CRP, the mean value was 65.88 mg/l (± 67.76), with a median at 36 mg/l and extremes of 6 mg/l and 192 mg/l.

Preoperative preparation involved a very small proportion of children, i.e. 1.3%. Almost all, 98.7%, of the children were classified as ASA 1U. Only 1.3% were classified as ASA 3U. Preoperative fasting duration was reported in 3.24% of patients with a mean of 5.2 hours (± 1.30), a median of 5 hours and extremes of 4 and 7 hours. The majority of children, 94%, had not received premedication. The latter was based on midazolam. Anesthetic induction was intravenous (IV) in 98% of cases. Only 2% of children had inhalation induction with sevoflurane. General anesthesia with orotracheal intubation was performed in 85.8% of children. The laryngeal mask was used in 10.1%. The maintenance was done with sevoflurane. Among the 154 patients, 16.2% had undergone a locoregional anesthesia. Among these cases, the distribution was equal between spinal and upper limb anesthesia. Blood transfusion was done in 1.3% of children in the event of hemorrhagic shock. The average duration of interventions was 78.89 minutes with a median of 60 minutes and extremes of 10 and 380 minutes. A quarter of the interventions, or 25%, lasted less than 40 minutes and three quarters, or 75%, within 110 minutes. The majority of interventions, 30.3%, lasted between 30 and 59 minutes. Waking up on the operating table was performed in almost all subjects, i.e. 98.7%. The majority of patients, 96%, had undergone simple hospitalization and in 4% a hospitalization in intensive care was required. The majority of patients (75.3%) had benefited from post-operative analgesia at the end of the intervention. Paracetamol was the most used analgesic in 76.7% of cases. The paracetamol-tramadol combination was administered in 18.9% while the paracetamol-NSAIDs combination was used in 4.3%. The evolution was favorable in 98.7% of the patients. Only 1.3% had presented a delay in awakening and a laryngospasm. We deplored a death on the operating table, which is 0.6%. The analytical study found no statistically significant correlation.

DISCUSSION

In our study, the average age of our patients was 6.96 years and the most represented age range was that of 10 years and over in 37.7% followed by that of 1 to 4 years in 23.4% of pediatric surgical emergencies cases. This distribution is superposable to the studies of Coulibaly in Bamako [9], and Mboup in Dakar [10], which had found average ages of 5.28 years ± 4.25 and 6.9 years respectively. This could be explained by the frequency of certain pathologies at school age, notably traumatic pathologies and appendicitis. The male predominance is clear in our series with 74% of cases and a sex ratio of 2.85. The same result was also found by other series in the literature such as the study by Mboup

[10], in Dakar, which found a similar result of 68.6% of male cases with a sex ratio of 2.1. This male predominance can be explained by the high frequency of traumatic pathologies which most often concern boys who are, by nature, more turbulent than girls but also the frequency of parietal pathologies in the latter. In our series, sickle cell disease was the most common field with a prevalence of 1.28%. Essola in Gabon had regained a higher prevalence with 11.9% of children suffering from SS sickle cell disease [11]. This difference could be related to the small size of our sample but also the ethnic mixing and the efforts made in reducing consanguineal marriages.

In our study, the group of orthopedic pathologies occupied the first place among pediatric surgical emergencies in one third of cases, that is 29.2%. This predominance of traumatic pathology in emergencies is found by several authors, notably Mboup in Dakar [10], and Abahuje in Rwanda [12], who respectively had 35.9% and 36.58%. This predominance of traumatic pathologies is in line with the results of several series in the literature. This explains the fact that in children, the bone has a very different structure from that of adults. Indeed, the bone is growing and its matrix is more charged with water, which makes it mechanically less resistant and therefore more vulnerable to fractures during more intense leisure activities at school age. Skin infections represent the second most represented group of pediatric surgical emergencies in 18.2% in our study. This could be explained by the delay in access to care, the level of education of parents, poverty and socio-cultural beliefs. In our study, ENT emergencies occupy the third diagnostic group with 16.2%. ENT emergencies are the prerogative of the child [13]. Their frequency in our context could be explained by the major risk of accidents from the age of prehension and especially when the child begins to move alone and explores his environment but also the frequency of tonsillitis and/or adenoids.

Complete blood count (CBC) was performed in 62% of our patients. Furthermore, the CBC is part of the expert recommendations on the request for pre-operative assessments. The majority of patients, 63%, had hyperleukocytosis and thrombocytopenia was noted in 8.7% of patients. CRP was only performed in 27.27% of patients. More than half of the patients did not have a CRP, and this could be explained by the frequent breakages of reagents but also by the lack of financial means. Preoperative fasting duration was reported in only 3.2% of patients in our study with an average of 5.2 hours (± 1.30). This duration ranged from 4 to 7 hours. This could be explained on the one hand by the emergency context and on the other hand by the absence of an operating room dedicated to pediatrics. The ASA classification showed that almost all subjects were classified as ASA 1U, with 98.7% indicating a good general condition. Only 1.3% were classified as ASA 3U, indicating a more severe general condition. The ASA class 1U is found in most African series, such as that of Joseph [14], and that of Otiobanda [15], whose percentages were respectively 73.04% and 78.3%. This predominance can be explained by the absence of comorbidities in children but also by the types of pathologies and early management.

General anesthesia was the most used technique in 85.8% of cases. This preference could be justified by the indications and by the young age of the children. This percentage is clearly superposable to that of Joseph in Benin, which is 89.85% [14], and significantly lower than those of Otiobanda [15], and Amengle [16], who found 98.9% and 97% respectively. This difference could be explained by the size of our sample but also by the average age. The predominance of general anesthesia in pediatric surgery over locoregional emergency anesthesia is a constant according to the literature because the patient is considered full stomach but also the young age of the children. The majority of children, 94%, had not received premedication in our series. Only the 5.8% benefited and midazolam was the only drug used. The goals of pre-medication are to reduce preoperative anxiety, facilitate separation of the child and his mother and induction, and help reduce post-operative psycho-behavioral disorders [17]. This anxiety is all the more important as the child's age is small. However, in our study, the predominance of children aged 10 and over is clear, which could justify the low premedication rate in our case. Anesthetic induction was mainly carried out intravenously in 98% of cases. Inhalatory induction is the most frequently used mode of induction in pediatric anesthesia and its main contraindication is the existence of a full stomach [18]. This could justify the preference of the intravenous route over inhalation for anesthetic induction in our context. The use of halogenated agents such as sevoflurane was common in our series in 83.8% of subjects, representing all general anesthesia. Sevoflurane is the quintessential halogen, especially in pediatrics. Locoregional anesthesia was performed in 5.2% of patients. Among these cases, the distribution was equal between perimedullary anesthesia and upper limb truncated anesthesia to 50%. This low rate of ALR use is widely reported in several African series [15-19]. The realization of the ALR must be carried out only by an anesthetist-resuscitator with suitable equipment and environment and with the strictest possible supervision, which is difficult in our contexts but especially in emergency situations. This could justify his weak practice. The distribution of anesthesia durations showed that the majority of interventions, namely 30.3%, lasted between 30 and 59 minutes, followed by those of 120 minutes or more in 22.4%. This variable time could be explained by the surgical indication, the intervention itself and the surgeon. Blood transfusion was very infrequent, involving only 1.3% of children. The majority of children, 98.7%, did not require a transfusion. This rate is significantly lower than that of Otiobanda which is 8.8% [15]. This could be explained

by the traumatic context of his study. Our low transfusion rate could be explained by the scarcity of hemorrhagic pathologies in our population. In our study, the majority of patients had benefited from post-operative analgesia in 75.3%. Post-operative analgesia is an important element of child care, because in addition to the ethical obligation to relieve it, it conditions the rapid return to a normal diet and activity. It must be part of the anaesthesia plan and its efficiency must be evaluated at an individual level and as part of a process to improve the quality of care [20]. No pain assessment tools were used in our series. It shows insufficient management of pain in the child both in evaluation and treatment. Our observation through this study confirms the remarks of Kane [21]. The author in a sub-regional survey (Senegal, Ivory Coast, Cameroon) reports an inconsistent assessment of pain by anesthesiologists and a scarcity of protocols. The treatment of pain was essentially recommended when the patient complained, which is not obvious in children. The evaluation of pain in children is complex, but necessary for appropriate pain management. Langlade [22], in his study also confirmed an insufficiency in the assessment of post-operative pain. It appears from our results that the administration of paracetamol alone was the most used in 76.7% of cases and intravenous paracetamol-tramadol combination was used in 18.9% and no morphine prescription was made. The sole prescription of paracetamol for post-operative analgesia is a proscribed practice. Currently, the management of post-operative pain falls under the concept of multimodal analgesia which is a combination of techniques and analgesics at different sites of action. Tramadol, which is the second molecule used, is increasingly being questioned in pediatrics. Indeed, tramadol is a respiratory depressant especially in patients with extensive metabolism [23]. As in our study, the use of morphine is non-existent compared to the Langlade study [22], which reports a low rate of morphine use likely due to their side effects. Our low rate is explained by the difficulty of post-operative monitoring of children placed on morphine because they do not have a pediatric surgery service. The majority of patients (97.4%) were awakened at the operating table and 96% were transferred to pediatrics after their surgical intervention. In our study, the morbidity rate was 0.64%. A lower mortality rate was reported by Essola with 0.1% with a larger cohort [11]. This rate is significantly lower than that of Egbohou in Togo [24], which had a mortality rate of around 9.03%. This difference could be explained by the size of our sample which is much smaller. The complication was a laryngospasm. Respiratory complications are the most noted in the literature [16-25]. In our series, the factors associated with the occurrence of complications were intubation and thrombopenia. The ENT surgical emergencies were the most likely to cause morbidity in 10%. One case of cardio-circulatory arrest was noted in our study, with a mortality rate of 0.64%. This percentage is superposable to that of Egbohou [24], and Coulibaly [9], who had 1.03% and 0.72% respectively. The death occurred in a neonatal context with a digestive malformation (anorectal malformation) associated with digestive perforation. This could be explained on one hand by the lack of exhaustive preoperative exploration of malformations and on the other hand by the absence of an adequate neonatal resuscitation tray. It should also be noted that the neonatal hospital mortality in countries without neonatal and paediatric surgical resuscitation services is significantly higher than in those with them.

CONCLUSION

The practice of pediatric anesthesia in emergency poses organizational difficulties due to the lack of an operating room suitable for pediatric surgery. A regular and up-to-date practice of pediatric anesthesia is necessary in order to reduce perioperative complications. The evaluation of pain in the child and the adoption of protocols will allow optimization of management.

BIBLIOGRAPHY

1. Bickler SW, Rode H. Surgical services for children in developing countries. Bull World Health Organ. 2002; 80(10) :829-35.
2. Julien-Marsollier F, Caseris M, Ilharreborde B, Dahmani S. Mise au point sur la prise en charge des urgences orthopédiques pédiatriques. Anesth Réanimation, 2022 ; 8(6) :582-6.
3. Sabourdin N, Boivin A. L'anesthésiologie en pédiatrie. In : Précis d'anesthésie et de réanimation [Internet]. Les Presses de l'Université de Montréal ; 2020 ; 615-34.
4. Macq C, Seguret F, Bringuier S, Sola C, Capdevila X, Dadure C. Photographie épidémiologique d'une année d'anesthésie pédiatrique en France. Ann Fr Anesth Réanimation, 2012 ; 31 (11) :835-9.
5. Mboup M. Urgences chirurgicales pédiatriques : étude rétrospective sur 220 cas à l'hôpital Principal de DAKAR. Dakar Med, 2023 ; 67(1).
6. Gnassingbe K. Prise en charge de l'enfant au bloc opératoire du CHU Tokoin de LOME. Rev Int Sc Méd, 2007; 9(3):75-9.
7. Abbas A, Laverde R, Yap A, Stephens CQ, Samad L, Seyi-Olajide JO. Routine Pediatric Surgical Emergencies: Incidence, Morbidity, and Mortality During the 1st 8000 Days of Life A Narrative Review. World J Surg. 2023 ; 47 (12) :3419-28.
8. Yapo B. L'anesthésie pédiatrique en Afrique noire francophone : quelle pratique? Rev Af Med Ur, 2013 ; 18(1) : 1-7
9. Coulibaly M, Koita SA, Almeimoune A, Coulibaly BB, Samate S, Dabo A. Pratique de l'anesthésie pédiatrique en Afrique Subsaharienne : Expérience de 3 années d'exercice au CHU Mère Enfant « Leluxembourg » de Bamako. Chir Pédiatrique. Rev Afr Anesth Med Urg. 2024 ; 29(2) : 57-62
10. Mboup M. Urgences chirurgicales pédiatriques : étude rétrospective sur 220 cas à l'hôpital Principal de Dakar. Dakar Med, 2023 ; 67.1.

11. Essola, L., Sima Zue, A., Obame, R., Ngomas, J. F., Kamel, G., & Bouanga Moudiba, C. (2013). Anesthésie pédiatrique en milieu Africain: expérience d'un hôpital gabonais à vocation adulte. *Rev Afr Anesth Med Urg*, *18*(1).
12. Abahuje E, Uyisabye I, Ssebuufu R. Epidemiology of pediatric surgery in Rwanda: A one year review. Rwanda Med J. 2016; 73(1):11-16.
13. Ondzotto G, Fouemina T, Lombet L, Akolbout D, Itiere F. Les urgences oto-rhino-laryngologiques de l'enfant au centre hospitalier universitaire de Brazzaville. A propos de 105 cas. Revue Internationale des Sciences Médicales, 2009 ; 11 : 48-53.
14. Joseph A, Serge M, Ernest A, Yasmine L, Eugène Z, Antoine GS. Practice of Pediatric Anesthesia in Sub-Saharan Africa: Experience of Two Referral Hospitals in Benin. Am J Pediatr, 2021 ; 7(4) :219-24.
15. Otiobanda GF, Mahaoungou-Nguimbi KC, Odzebe AWS, Mboutol Mandavo C, Ekouya Bowassa G, Kangni-Freitas N. Pratique de l'anesthésie pédiatrique au Centre Hospitalier et universitaire de Brazzaville. Rev Anesth Med Urg Réanim, 2011; 16(1): 3-6.
16. Amengle AL, Bengono BR, Metogo MJA, Zambo A, Esiene A, Ze MJ. Complications per et post-opératoires en anesthésie pédiatrique dans deux hôpitaux de la ville de Yaoundé. Rev Afr Chir Spéc, 2019 ; 13(1) :16-20.
17. Cohen-Salmon D. Répercussions psycho-comportementales en périopératoire chez l'enfant. Ann Fr Anesth Réanimation, 2010 ; 29(4) :289-300.
18. Baujard C, Staiti G. Comment gérer une induction inhalatoire chez l'enfant ? Prat En Anesth Réanimation, 2009 ; 13(6) :438-43.
19. D MU, Rivain IF. Pratique de l'anesthésie pédiatrique dans la Ville de Lubumbashi en RD Congo : Indications, Complications et Facteurs de mortalité. Rev Afr Médecine Santé Publique, 2023 ; 134-5.
20. Veyckemans F. Comment gérer l'analgésie post-opératoire de l'enfant et en fonction de quoi ? Anesth Réanimation, 2018; 4(4) :338-44.
21. Kane O, Boua N, Hentchoya R, Seck M, Fall AN, Barry MS. Assessment of postoperative pain management practices in Cameroon, Ivory Coast and Senegal: A multi-national survey. Trop Doct, 2021 ; 51(3) :350-6. 115
22. Langlade A, Bellanger F, Cornet C, Monrigal MC, Ballandyne S, Bonnet F. Démarche assurance-qualité pour la prise en charge des douleurs post opératoires : proposition d'un outil de réalisation d'enquêtes. Ann Fr Anesth Réanimation, 2002 ; 21(4) :276-94.
23. Annequin, P. D., Kieffert, P., Pouymayou, J., Robinet, S., & Simon, P. N. *Opioïdes, métabolisme et métabolites, soyons plus clairs! Quels sont les risques? Quelles sont les précautions?*
24. Mouzou, T., Egbohou, P., Tomta, K., Sama, H., Assenouwe, S., Akala, Y., ... & Randolph, L. (2016). Pratique de l'anesthésie pédiatrique dans un pays en développement: expérience du CHU Sylvanus Olympio de Lomé au Togo. *Age*, *30*, 41.
25. Hmamouchi B, Nejmi S, Benkhalifa S, Dehdouh A, Chlilek A. [Morbidity and mortality linked to paediatric anaesthesia in the Maghreb]. Ann Fr Anesth Reanim, 2009 ; 28(7-8) :671-3.

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