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Post-operative pain management in paediatric surgery at Sylvanus Olympio University Teaching Hospital, Togo

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ABSTRACT

Background: The aim of this study was to evaluate pain management in paediatric surgery at Sylvanus Olympio University Teaching Hospital, Lome. **Patients and Methods:** A prospective descriptive study was conducted in the Department of Anaesthesiology and Intensive Care at Sylvanus Olympio teaching hospital from 1 January to 30 June 2012. Data collected include: demography, type of surgery, American Society of Anaesthesiologists (ASA) classification, anaesthetic protocol, analgesia technique, post-operative complications and cost of analgesia. **Results:** The study includes 106 post-operative children. Abdominal surgery was performed in 41.5% and orthopaedic surgery in 31.1%. A total of 75% of patients were classified ASA 1. General anaesthesia (GA) was performed in 88%. Anaesthetists supervised post-operative care in 21.7% cases. Multimodal analgesia was used in every case and 12% of patients received a regional block. The most frequently unwanted effects of analgesics used were nausea and/or vomiting in 12.3%. At H24, child under 7 years have more pain assessment than those from 7 to 15 years (46% vs 24%) and this difference was statistically significant (chi-square = 4.7598; $P = 0.0291 < 0.05$). The average cost of peri-operative analgesia under loco regional analgesia (LRA) versus GA during the first 48 h post-operative was US $23 versus $46. **Conclusion:** Our study showed that post-operative pain management in paediatric surgery is often not well controlled and paediatric loco regional analgesia technique is under practiced in sub Saharan Africa.

Key words: Paediatric anaesthesia, post-operative pain, Togo

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INTRODUCTION

For post-operative pain management, intravenous multimodal analgesia and loco regional analgesia (LRA) seem to be mostly practiced.[1] In developed world, there is paediatric equipment and more techniques as continuous peripheral nerve blocks have generated increasing interest.[2] Methods of non-pharmacologique pain control as distraction, music therapy, hypnosis are also described in paediatric surgery.[3] The difficulty of assessing intensity of pain in less than 5 years infants and fears of drug overdose explain delay and particularly of management of post-operative pain in children. In developing countries little researches have been done about management of post-operative pain especially in paediatric surgery.[4] In Togo, management of pain in children appears to be limited because of precarious conditions in under equipped locations.[5] The main objective of this study was to evaluate management of post-operative analgesia in paediatric surgery at Sylvanus Olympio University Teaching Hospital, Lome.

PATIENTS AND METHODS

After approval of hospital's ethics and protection of people committee, we conducted a prospective descriptive study from 1 January to 30 June 2012. A survey form was used to support the data. All children from both the sexes who were aged 0-15 years, hospitalised and undergoing elective or emergency surgery were included. Children who have ambulatory surgery were not retained. Demographic parameters, type of surgery, American Society of Anaesthesiologists (ASA) classification, anaesthetic protocol, technique and analgesia efficacy, post-operative complications and cost of analgesia were analysed. General anaesthesia (GA) includes intravenous sedation and GA with oro tracheal intubation. While peripheral nerve or peri-medullar blocks are insufficient; we used IV sedation and oro tracheal intubation if total failure. Post-operative protocol, pain management, analgesics

and anaesthetics used is defined by anaesthetist during pre-operative examination. Anaesthetist nurses are responsible for the execution of the protocol. For high and moderate pain risk surgery, patients are hospitalised in resuscitation room or intensive care unit and for low pain risk surgery they are referred to recovery room or care unit. The assessment of post-operative pain during first 00, 24 and 48 h post-operatively was made by three scales according to the age of patient including: Visual analogue scale (VAS), verbal rating scale (VRS) and comfort behaviour scale (CBS). The VAS was presented as a graduated line of 10 cm long with designations from no pain at the left edge to maximum pain at the right. The patient was asked to position a cursor in the position that best represented the intensity of his or her pain (1-10). The VRS was presented to the patient as a series of descriptions, ranked and numbered, ranging from no pain (0), mild pain (1), moderate pain (2) and intense pain (3) to extremely intense pain (4). For CBS, we use Children's Hospital of Eastern Ontario Pain scale (CHEOPS),[6] ranging from normal (4) to maximum pain (13) and Amiel–Tison scale,[7] ranging from no pain (0) to major pain (20) according to behavioural items. Statistical analyses were performed by Epi Info 7™ (Centers for Disease Control and Prevention, Atlanta, GA).

RESULTS

The study includes 106 post-operative children. Their average age was 9 years ranging from 0 month to 15 years. There was a male predominance in 71% of cases. The average weight was 26 kg (range 3-44 kg). There was history of asthma in 11.3%, prematurity in 10.4% and 6.6% had allergy. In 51% cases it was surgical emergency and the surgery lasted in average 2 h ranging from 30 min to 3 h. Abdominal surgery was performed in 41.5%, orthopaedic surgery in 31.1% and urogenital in 9.4% [Table 1].

For children aged below 7 years, hernia (20%), hydrocele (15%) urethroplasty (10%), orchidopexy (10%) and testicular ectopia (10%) repairs was performed. For children aged 7-15 years include, abdominal surgery (50%); orthopaedic and trauma (30%); ENT (15%) and other surgery was performed. A total of 75% of patients were classified ASA 1, while 15% and 10% were classified ASA 2 and ASA 3, respectively. GA was performed in 88%. Anaesthetic agents used were: midazolam (15%), diazepam (10%), propofol (50%), fentanyl (70%), isoflurane (50%) and halothane (30%). For 12% of LRA, there were: Spinal anaesthesia (54%), ilio inguinal (20%), iliohypogastric (11%), caudal (9%) and penile blocks (6%) [Figure 1].

Table 1: Distribution of patients according to the type of surgery

Type of surgery	Number of patients	Percentage
Abdominal	44	41.5
Orthopaedic	33	31.1
Urogenital	10	9.4
Plastic	7	6.6
Thoracic	7	6.6
Neurosurgery	3	2.9
Others	2	1.8
Total	106	100

We used IV sedation with association propofol and fentanyl for children aged over 7 years or isoflurane/halothane associated to fentanyl for children aged below 7 years. Post-operative analgesia started before the last point of suture in 67% cases and at recovery in 33% cases. Patients have GA or LRA intra-operatively. Those who have loco regional block have supplementary IV sedation with opioids and/or narcotic if the block is insufficient but GA with orotracheal tube if total failure. A total of 49.1% of patients were referred to care room, 29.2% in intensive care unit and 21.7% in recovery room. In 50.9% post-operative caregivers were non-specialist nurses and anaesthesia nurses in 27.4%. Anaesthetists supervised post-operative care in 21.7% cases. The most used analgesics are shown in Figure 2.

Multimodal analgesia was used in every case. There were many combinations: Paracetamol + ketoprofen (40%), paracetamol + ketoprofen + tramadol or nefopam (30%), paracetamol + ketoprofen + opioïds (18%) and LRA analgesia (12%). A total of 12% of patients received a regional block in addition to intravenous analgesia. The most frequently side effects of the analgesics used were nausea and/or vomiting in 12.3%, urinary retention in 2.8% and respiratory depression in 1.9%. At hour zero (H00), children aged

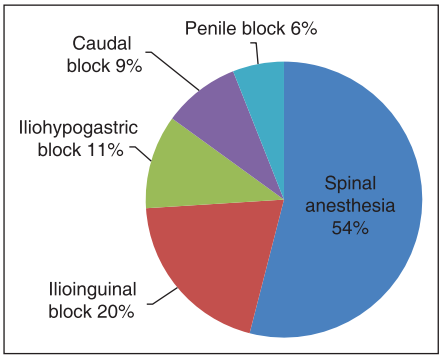


Figure 1: Distribution of patients according to the type of loco regional anaesthesia performed

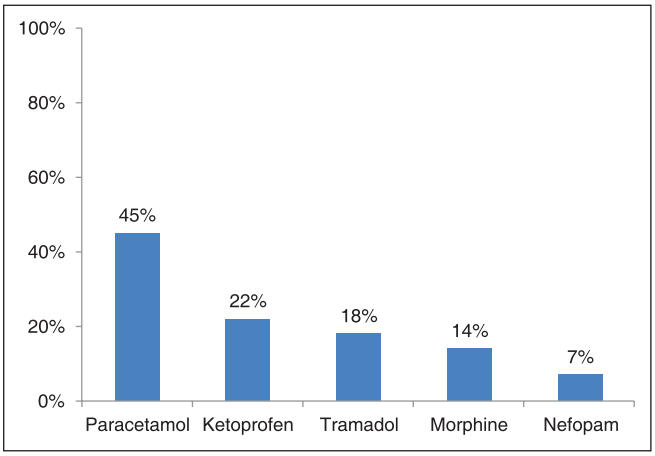


Figure 2: Distribution of patients by analgesics used

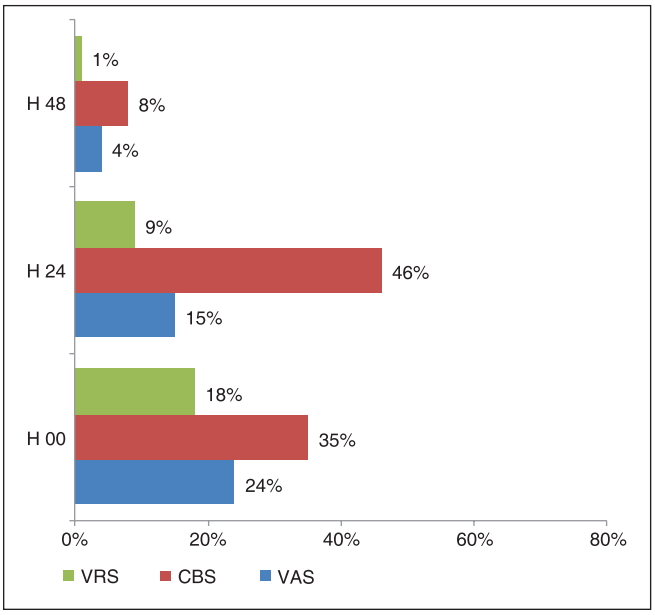


Figure 3: Distribution of patients according to the pain scale at first 00, 24 and 48 h post-operatively VAS, visual analog scale; CBS, comfort behavior scale; VRS, verbal rating scale

7-15 years have more pain assessment than those aged under 7 years (42% vs 35%) (chi-square = 0.3611; P = 0.5479). At H24, child aged under 7 years have more pain assessment than those aged 7-15 years (46% vs 24%) and this difference was statistically significant (chi-square = 4.7598; P = 0.0291 < 0.05). At H48, 8% of children aged under 7 years have pain assessment versus 5% of child aged 7-15 years (chi-square = 0.2638; P = 0.6075). Pain assessment during the first 48 h post-operatively is shown in Figure 3.

The average cost of peri-operative analgesia under LRA versus GA during the first 48 h post-operative was US $23 versus $46.

DISCUSSION

Post-operative pain in paediatric surgery remains a major problem; it seems undervalued and undertreated especially in infants.[8] The effectiveness of multimodal analgesia in paediatric surgery has been proven in Nigeria and Mali.[9,10] The careful use of morphine patient control analgesia with appropriate monitoring can reduce sleep disturbance, described in some infants.[11] Spinal anaesthesia (54%), ilio inguinal (20%), ilio hypogastric (11%), caudal (9%) and penile blocks (6%) under neuro stimulation are the main techniques of loco regional anaesthesia at Sylvanus Olympio teaching hospital. The benefits of regional anaesthesia in paediatric settings are well known.[12] Spinal anaesthesia and continuous peripheral nerve blocks under ultrasound guide seems to provide efficacy anaesthesia and post-operative analgesia while minimising complications.[13,14] We do not use to associate systematically loco regional block with GA for reduce intra-operatively opioids consummation and its benefits on post-operative analgesia.[12] In children aged 7-15 years, post-operative pain decreases gradually during the first 48 h post-operatively, probably due to more co-operation and better communication at this age. For children aged below 7 years, pain increases during the first 24 h before regression at 48 h post-operatively. The high threshold of nociception and difficulties in communication in neonates and infants may explain this lack of management.[15,16] Pain assessment during first 48 h post-operatively is more important for children aged below 7 years than those aged 7-15 years [Figure 3]. Anaesthetists supervised post-operative care in 21.7% cases. Human and material deficiencies explain the low medicalisation of anaesthesiology in our context.[17] There is no specifically paediatric anaesthetist in our context; hence, every anaesthetist physician used to manage patient's post-operative pain according to the cases, 12.3% of children presented post-operative nausea and vomiting. Wagner *et al*. in USA also described nausea and vomiting as having the most side effects.[18] Preventive measures are needed to reduce additional costs related to post-operative complications. Urinary retention found in 2.8% and respiratory depression in 1.9% of cases were not recently described in Niger due to the low use of opioid analgesics in this country.[4] Post-operative pain decreases gradually during the first 48 h for children aged over 7 years. At H24 post-operatively, children aged below 7 years have more pain assessment than those aged 7-15 years (46% vs 24%) (chi-square = 4.7598; P = 0.0291 < 0.05). The under evaluation and complexity of comfort behaviour scales explain under treatment of post-operative pain especially in infants.[8,19]

CONCLUSION

Our study is a contribution to knowledge of post-operative pain management in resource-poor areas of the world. This survey shows under management of post-operative pain in paediatric surgery at Sylvanus Olympio University Teaching Hospital, Togo. Sensitisation of anaesthetists is important for practice of loco regional anaesthesia, good use of multimodal analgesia and continuing medical education for a regular update in paediatric anaesthesia. In developing countries efforts should be made to endow hospitals of paediatric equipment required for minimum standard safety in paediatric anaesthesia.

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