

## Intra-Operative & Post-Operative Complications in Pediatric Anesthesia: A Study in Cumilla Medical College, Cumilla, Bangladesh

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| Received: 03.09.2020 | Accepted: 13.09.2020 | Published: 20.09.2020

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## Abstract

## Original Research Article

**Introduction:** Pediatric patients differ in their drug requirements because of their smaller body size, differences in body composition and handling capacity of drugs. Usually dosages are based on body weight, because it correlates so intimately with body water compartments. **Objective:** To find out the Intra-Operative & Post-Operative Complications in Pediatric Anesthesia. **Materials & Methods:** The present study was conducted in the Department of Anaesthesiology & ICU, Cumilla Medical College, Cumilla, Bangladesh during from January 2017 to December 2017. It included 250 pediatric patients of both gender. Parents were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee. General information such as name, age, sex, ASA status, technique of anesthesia and complications were recorded. **Results:** The present study was conducted to identify anesthesia-related complications in pediatric patients. The present study was conducted on 250 pediatric patients of both genders. Factors such as conscious state, colour, respiration, pulse and blood pressure were also assessed. Age group 1 month- 1 year had 22 males and 33 females. 1-5 years had 45 males and 50 females, 5-10 years had 15 males and 20 females and 10-14 years had 40 males and 25 females. The difference was non-significant (P=0.5). Patients had ASA I (180), ASA 2 (50), ASA 3 (15), ASA 4 (3) and ASA 5 (2) status. The difference was significant (P=0.05). Type of anesthesia was general anesthesia (200), general anesthesia with caudal block (27), subarachnoid block (5) and general anesthesia with local anesthesia (18). The difference was significant (P=0.01). Common intra-operative complications were bradycardia (5), tachycardia (4), hypotension (4), hypertension (3), cardiac arrest (2), bronchospasm (1), hypoventilation (2), pain (3) and prolonged unconsciousness (1). The difference was significant (P=0.01). Post-operative complications were shivering (6), pain (5), hemorrhage (7), hypoventilation (3), respiratory arrest (2), laryngospasm (4) and hypoventilation (2). The difference was non-significant (P=0.5). **Conclusion:** In order to avoid or minimize these complications occurring at induction to the barest minimum, a consultant anesthetist or an experienced anesthetist must always be in attendance to handle difficult cases.

**Keywords:** General Anesthesia, Laryngospasm, Pediatric.

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## INTRODUCTION

Typical complications in pediatric anesthesia are respiratory problems, medication errors, difficulties with the intravenous puncture and pulmonary aspiration. In the postoperative setting, nausea and vomiting, pain, and emergence delirium can be mentioned as typical complications. Major differences in anatomy and physiology in the small infant have important consequences in many aspects of anesthesia. The physical disparity between the adult and child diminishes at 10-12 years of age although major psychological differences continue till adolescence. In order to reduce the morbidity and mortality associated

with pediatric anesthesia, the anesthetist should have a sound knowledge of the physiologic, anatomic and pharmacologic peculiarities of each developmental stage of childhood. Laryngospasm is a common occurrence in pediatric anesthesia and is usually easy to manage. It is however a significant cause of severe adverse outcome including cardiac arrest and its sequelae [1]. Pediatric patients differ in their drug requirements because of their smaller body size, differences in body composition and handling capacity of drugs. Usually dosages are based on body weight, because it correlates so intimately with body water compartments. Pediatric anesthesia morbidity and mortality in the perioperative period has been studied

by Cohen *et al.*, [2], an incidence of 35% was reported by the same author. In another multicenter study, complications related to anesthesia in infants and children were also reported. A study carried out in Nigeria revealed an incidence of 10% adverse events in pediatric surgical emergencies. Advances in monitoring and the declining use of halothane have led to a change in the types of risk. Risk is defined as the chance or possibility of danger, loss or injury. It is therefore an ever-present part of life. What constitutes a serious or worrying risk is dependent upon perspective. This is readily illustrated in the health care industry. Risk is viewed in quite different lights by patients, doctors, hospital managers, insurance companies and policy-makers. While patients worry about the prospect of failed treatment and unpleasant side effects, anesthetists will be more concerned about the immediate risks of major disability and death associated with surgery. Similarly, while individual hospital managers and insurance companies are keen to minimize their exposure to financial liability, health policy-makers aim to ensure patients' access to the most appropriate centers for their treatment [3]. The present study was conducted to identify anesthesia-related complications in pediatric patients.

## MATERIALS & METHODS

The present study was conducted in the Department of Anaesthesiology & ICU, Cumilla Medical College, Cumilla, Bangladesh during from January 2017 to December 2017. It included 250 pediatric patients of both gender. Parents were informed regarding the study and written consent was obtained. Ethical clearance was taken from institutional ethical committee. General information such as name, age, sex, ASA status, technique of anesthesia and complications were recorded. Factors such as conscious state, colour, respiration, pulse and blood pressure were also assessed. Results were subjected to statistical analysis using chi-square test. P value < 0.05 was considered significant. All data analysis windows "SPSS" version 19.0.

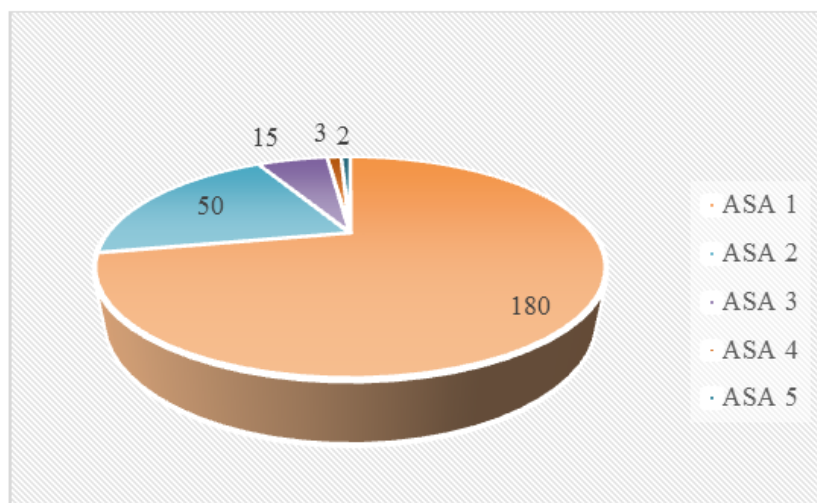
## RESULTS

The present study was conducted on 250 pediatric patients of both genders. General information such as name, age, sex, ASA status, technique of anesthesia, and complications were recorded. Factors such as conscious state, colour, respiration, pulse and blood pressure were also assessed. Age group 1 month-1 year had 22 males and 33 females. 1-5 years had 45 males and 50 females, 5-10 years had 15 males and 20 females and 10-14 years had 40 males and 25 females. The difference was non-significant (P=0.5) (Table-1).

**Table-1: Age distribution of patients (N=250)**

Age	Males	Females	P value
1 month-12 month	22	33	0.5
1-5 years	45	50	
5-10 years	15	20	
10-14 years	40	25	
Total	122	128	

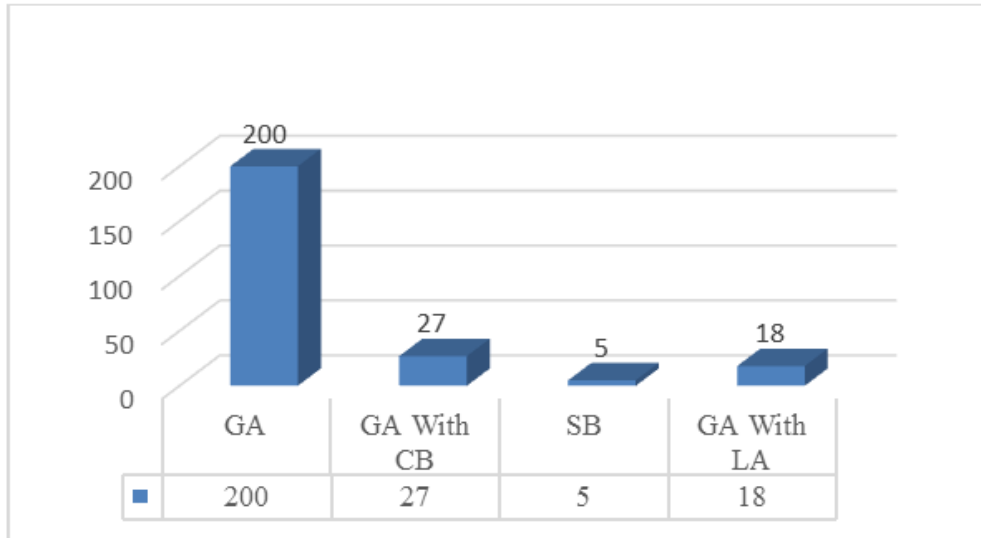
Figure-1 shows that patients had ASA I (180), ASA 2 (50), ASA 3 (15), ASA 4 (3) and ASA 5 (2) status. The difference was significant (P=0.05).



**Fig-1: ASA status in patients was significant (P=0.05)**

Figure-2 shows that type of anesthesia was general anesthesia (200), general anesthesia with caudal block (27), subarachnoid block (5) and general

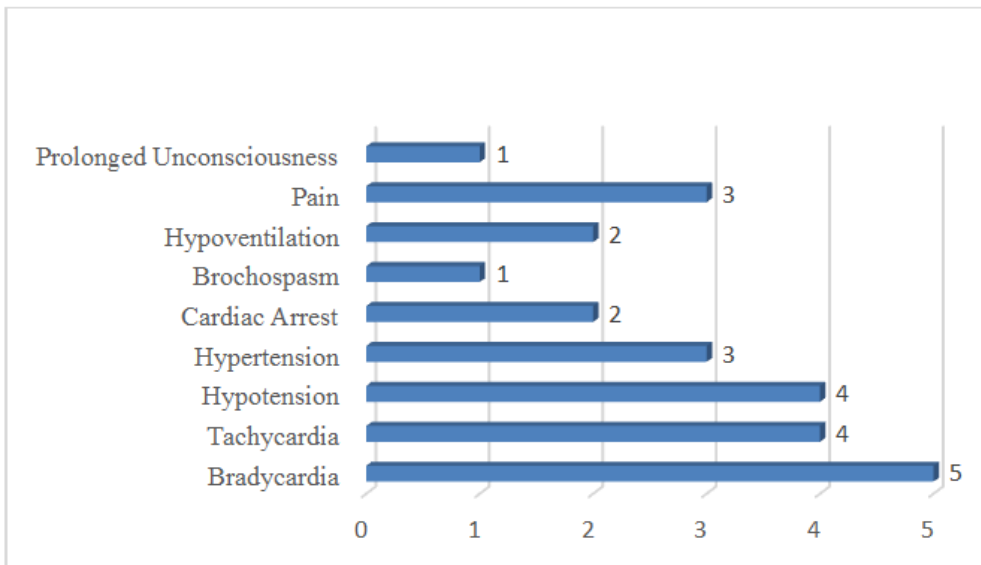
anesthesia with local anesthesia (18). The difference was significant (P-0.01).



**Fig-2: Choice of Anesthesia**

Figure-3 shows that common intra- operative complications were bradycardia (5), tachycardia (4), hypotension (4), hypertension (3), cardiac arrest (2),

brochospasm (1), hypoventilation (2), pain (3) and prolonged unconsciousness (1). The difference was significant (P-0.01).



**Fig-3: Intra-operative complications**

Figure-4 shows that post- operative complications were shivering (6), pain (5), hemorrhage (7), hypoventilation (3), respiratory arrest (2),

laryngospasm (4) and hypoventilation (2). The difference was non- significant (P-0.1).

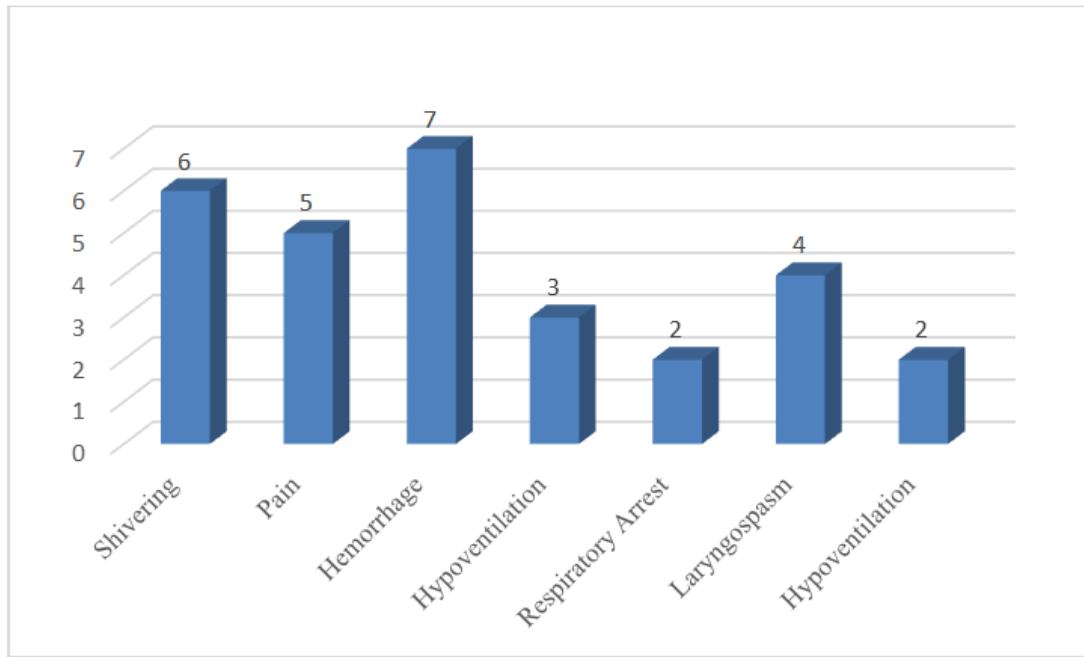


Fig-4: Post-operative complications

## DISCUSSION

Standard monitoring is essential in pediatric anesthesia care particularly for early detection and prevention of dangerous complications such as bradycardia, hypotension, hypoxia and adverse temperature changes. The hallmark of pediatric anesthesia has always been the precordial stethoscope because it allows constant monitoring of breath sounds, along with the heart sounds, rate and rhythm. Changes in clinical status happen quickly in the newborn with only subtle signs heralding serious alterations in the patient's clinical status [4]. Difficulty of intravenous cannulation is sometimes encountered especially in the preterm neonates, overweight babies and when most peripheral veins had been ruined from withdrawal of blood sample for laboratory investigations and intravenous therapy. This problem was sometimes solved with the help of pediatricians or rarely the surgeons who perform venous cut downs [5]. The present study was conducted to identify anesthesia-related complications in pediatric patients. In this study, maximum patients were in age group 1-5 years followed by 10-14 years, 1month- 1 year and 5-10 years. The type of anesthesia was general anesthesia, general anesthesia with caudal block, subarachnoid block and general anesthesia with local anesthesia. This is similar to Morray [6]. Complications arising at induction of anesthesia in neonates and small infants in our study were mainly respiratory and cardiovascular. They may manifest as apnea, bronchospasm, laryngospasm, cyanosis, bradycardia and cardiac arrest. These are likely to be due to stimulation of the larynx during laryngoscopy and tracheal intubation at light planes of anesthesia. Neonates and infants have very active airway reflexes and therefore require adequate depth of anesthesia for laryngoscopy and tracheal

intubation. The preterms infants are more prone to developing postoperative respiratory complications as evidenced by our study. In neonates, if bradycardia is not promptly treated with 100% oxygen, they readily develop hypoxic cardiac arrest [7]. We found that common intra-operative complications were bradycardia, tachycardia, hypotension, hypertension, cardiac arrest, bronchospasm, hypoventilation, pain and prolonged unconsciousness. Post-operative complications were shivering, pain, hemorrhage, hypoventilation, respiratory arrest, laryngospasm and hypoventilation. This is in agreement with Jiminez N [8]. It has been recognized that infants and children require adequate pain management and if not received May actually adversely affect patient outcome. Ageappropriate pain assessment is essential and both subjective and objective assessment tools may be utilized depending on patient age and clinical status. Many pain assessment scales have been develop to assess pain in children. The most reliable form of pain assessment is self-report. Infants less than 1 month old have the highest rate of adverse events both intraoperatively and in the recovery room [9]. Anesthesia, because of its depression on metabolism and dilatation of cutaneous vessels, tends to cause a progressive fall in body temperature [10, 11]. In the recovery room, pain was treated with opioid analgesics after excluding other causes of crying and discomfort. Our study showed a similar finding. The presence of pain implies inadequate analgesia following surgery. There have been a number of myths and misunderstandings related to pain in children which has led to historically inadequate treatment of pediatric pain [12].

## CONCLUSION

In order to avoid or minimize these complications occurring at induction to the barest minimum, a consultant anesthetist or an experienced anesthetist must always be in attendance to handle difficult cases.

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