

THE CHALLENGES REGARDING ANESTHESIA IN RURAL INFANTS

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ABSTRACT

Background: Bangladesh, being a developing country, is a big, populous country with wide disparities in health-care standards. While cities have state-of-the-art hospitals staffed by skilled doctors, rural regions, where the majority of the population resides, suffer from a serious lack of resources. Patients and family members were characterized as being irritated, anxious, frustrated, and angry when being treated for newborns. Also, anesthesiologists expressed discomfort, unease, dissatisfaction, and feeling challenged. **Objective:** To evaluate the challenges regarding anesthesia in rural infants. **Method:** This cross-sectional study place was carried out at Bangladesh Shishu Hospital & Institute, Bangladesh where data were collected from January 2017 to January 2018. A total of 100 pediatric patients who had mainly elective surgery were included in the study. Sample were collected through purposive sampling as per inclusion criteria. **Results:** In our study, most of the infants belong to the 2 month-12 months age group and majority were from rural area (60%). Of them, 60% underwent general surgery followed by 15% ENT surgery, 14% cardiac surgery and 11% other surgeries. Regarding intraoperative & postoperative complications where in intraoperative complications, 75% had bradycardia followed by 15% tachycardia, 4% hypotension and 3% dysrhythmia. Where as in post-operative complications, 28% had prolonged unconsciousness, 18% had restlessness, 15% had pain and 11% had tachycardia. **Conclusion:** The cornerstones of safe pediatric anesthetic practice include: careful preoperative assessment and optimization of patients, strict adherence to the ideal requirements of pediatric anesthesia and the presence of an experienced senior and dedicated anesthetic team.

KEYWORDS: anesthesia, general surgery, infants.**INTRODUCTION**

Major differences in anatomy and physiology of the infants 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. 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 has been found associated with huge unexpected morbidity and mortality in the perioperative period.^[1]

In another multicenter study, complications related to anesthesia in infants and children were also reported.^[2] A study carried out in Nigeria revealed an incidence of 10% adverse events in pediatric surgical emergencies.^[3]

In this study, our main goal is to evaluate the challenges regarding anesthesia in rural infants.

Objective

To assess the challenges regarding anesthesia in rural infants.

METHODOLOGY**Types of study**

- It was a cross sectional type of study.

Place and period of the study

- The study place was carried out at *Bangladesh Shishu Hospital & Institute, Bangladesh* where data were collected from January 2017 to January 2018.

Study population

- A total of 100 pediatric patients who had mainly elective surgery were included in the study. Sample were collected through purposive sampling as per inclusion criteria.

Data analysis

• All collected data were coding and input in SPSS-25 for further analysis. Both descriptive and inferential statistics done. Descriptive statistics included frequency distribution, percent, mean, standard deviation; graph, tables, figures and inferential statistics.

RESULTS

In table-1 shows age distribution of the infants where most of the infants belong to the 2 months-12 months age group, 80%, followed by 20% in 1 day to 1-month age group. The following table is given below in detail:

Table 1: Age distribution of the infants.

Age group	%
1 day - 1 month	20%
2months - 12months	80%

Figure-1 shows gender distribution where majority were male, 60%. The following figure is given below in detail:

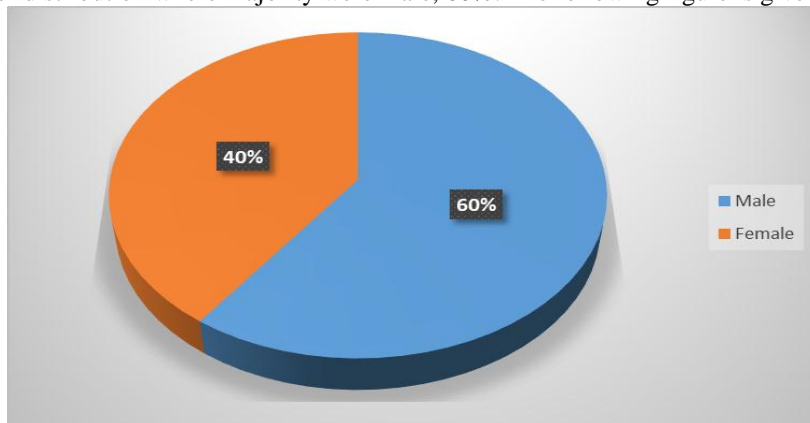
**Figure-1: Gender distribution of the patients.**

Table-2 shows distribution of infants in relation to anesthesia status. 82% patients had general anesthesia. The table is given below in details:

Table 2: Distribution of infants in relation to anesthesia status.

ASA	%
ASA 1	72%
ASA 2	10%
ASA 3	18%

Table-3 shows distribution of the infants according to surgery where 60% were general surgery followed by 15% ENT surgery, 14% were cardiothoracic surgery and 11% others surgery. The table is given below in details:

Table 3: Distribution of the infants according to surgery.

Surgical Procedures	%
General Surgery	60%
ENT surgery	15%
Cardiothoracic surgery	14%
Other surgeries	11%

Figure-2 shows choice of techniques regarding anesthesia where 82% were general anesthesia, followed by 10% general anesthesia with caudal block, 5% general anesthesia with local infiltration and 3% subarachnoid block cases. The figure is given below in details:

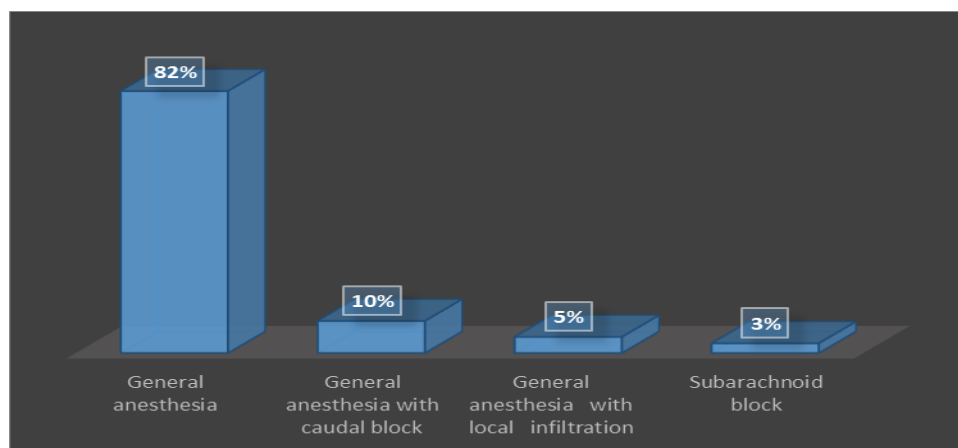
**Figure-2: Choice of techniques regarding anesthesia.**

Table-4 shows Intra & Postoperative complications where in intraoperative complications, 75% had bradycardia followed by 15% tachycardia, 4% hypotension and 3% dysrhythmia. Regarding post

operative complications 28% had prolonged unconsciousness, 18% had restlessness, 15% had pain, 11% had tachycardia. The table is given below in details:

Table 4: Intra & Postoperative complications of the infants.

Intraoperative complication	%
Bradycardia	75%
Tachycardia	15%
Hypotension	4%
Dysrhythmia	3%
Cardiac arrest	2%
Apnoea	1%
Total	100%

Post-operative complications	%
Prolonged unconsciousness	28%
Restlessness	18%
Pain	15%
Tachycardia	12%
Hypotension	11%
Hemorrhage	9%
Hypoventilation	5%
Respiratory arrest	2%
Total	100%

DISCUSSION

The commonest respiratory complications during intra and post operative periods observed in this study were bronchospasm, laryngospasm, hypoventilation and apnea. Upper respiratory tract infection (either due to viral or bacteria) is common in pediatric group. The two cases of bronchospasm were treated with administration of 100% oxygen and intravenous aminophylline. Three preterm infants weighing 1.6 kg, 1.9 kg and 2 kg respectively, were transferred to the Intensive Care Unit for ventilatory support. Patients with upper respiratory tract infection are usually not accepted for elective surgery. This is the commonest cause of cancellation of pediatric cases. Children aged less than 1 year appear to have an increased incidence of airway complications.^[4-7]

Complications arising at induction of anesthesia in neonates and 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. Hypoxia and dysrhythmia are the commonest causes of cardiac arrest in neonates and infants.

Whereas one study reported that, in intraoperative complications, 70% had bradycardia followed by 20% tachycardia, 5% hypotension, 2% dysrhythmia. Regarding postoperative complications 30% had prolonged unconsciousness, 21% had restlessness, 15% had pain and 10% had tachycardia.^[8]

LIMITATION

- A paucity of data regarding anesthesia, surgery, and work-related issues also small sample size reported as a limitation in this study.

CONCLUSION

The cornerstones of safe pediatric anesthetic practice include: careful preoperative assessment and optimization of patients, strict adherence to the ideal requirements of pediatric anesthesia and presence of an experienced senior and dedicated anesthetic team.

REFERENCES

1. COHEN MM, CAMERON CB, DUNCAN PG: Paediatric Anaesthesia morbidity and mortality in the perioperative period. *Anesthesia Analgesia*, 1990; 7: 160-7.
2. TIRET L, NIVOCHE Y, HATTON F, DESMONTS JM AND VOURC'H G: Complications related to Anaesthesia in infants and children. A prospective survey of 40240 Anesthetics. *Br J Anaesth*, 1988; 61: 263-269.
3. BAMGBADE OA, SOYANNWO OA, SANUSI AA: Anaesthesia for Paediatric Surgical Emergencies in Ibadan. *Afr J of Anaesth and Intensive Care*, 1997; 3: 35-37.

4. COHEN MM, CAMERON CB: Should you cancel the operation, if the child has an upper respiratory tract infection? *Anesth Analg*, 1991; 72: 282-288.
5. SHREINER MS, O'HARA I, MARKAKIS DA, POLITIS GD: Do children who experience laryngospasm have an increased risk of upper respiratory tract infection? *Anesthesiology*, 1996; 85: 475-480.
6. TAIT AR, REYNOLDS PI, GUTSTEIN HB: Factors that influence an anesthesiologist's decision to cancel elective surgery for the child with an upper respiratory tract infection. *J Clin Anesth*, 1995; 7: 491-9.
7. ANNEKE E.E: In Basic Consideration of Paediatric Anaesthesia. 1st edition. WFSA Manual, 1992; 41-43.
8. STEWARD DAVID J (1979): Physiology of temperature homeostasis manual of Paediatric Anaesthesia. Churchill Livingstone, 17.