

## Comparative Study of Neonatal Mortality Rate in Pelvic Colostomy for Anorectal Malformation (ARM) under General and Local Anaesthesia

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### Abstract

**Background:** The malformations of the anorectum are common congenital anomalies. The usual treatment of high anorectal malformations is creating a colostomy at birth under general anaesthesia (G/A) and local anaesthesia (L/A). **Objectives:** To evaluate the mortality rate under general and local anaesthesia, for pelvic colostomy in neonate and comparison between two groups. **Methodology:** This cross sectional study on mortality rate in neonates' undergone pelvic colostomy in the Department of Paediatric Surgery of DMCH from January 2009 to December 2010. 130 patients (70M, 60F) with high anorectal malformation were included in the study. All had well developed sacrum and natal cleft, and weight more than 3 Kg. 72 patient under G/A and 58 patient under L/A pelvic colostomy was performed. **Results:** 54 (75%) patient was survived and 18 (25%) patient death under G/A, on the other hand 52 (89.66%) survived and 6 (10.34%) death under L/A ( $p=.05$ ). **Conclusions:** These results suggest that mortality rate is more in neonate for pelvic colostomy under G/A than L/A.

**Key words:** Anorectal malformation (ARM), pelvic colostomy, anaesthesia, mortality.

### Introduction

The malformations of the anorectum (ARM) are common congenital anomalies which comprise of a spectrum of diseases ranging from a simple membrane covering the anus to complete anorectal agenesis<sup>1</sup>. ARM generally requires surgery in neonates which has been a challenge for paediatric surgeons for several generations. It is a complex operation for a major anomaly, the results of which are satisfactory if the sacrum and muscle complex is relatively normal. ARMs are classified into high and low anomalies according to the position of rectal pouch with respect to the puborectalis sling<sup>1</sup>. Both varieties are more common in males<sup>2</sup>. Low anomalies in both genders are repaired without a colostomy. In high Varieties ARM, pelvic colostomy is done as a first step of stage procedure. To do pelvic colostomy, under general anaesthesia or local anaesthesia are usually used<sup>2</sup>. Infant mortality rate under these anaesthesia are evaluated to determine the better option of anaesthesia. The aim of the present study was to evaluate the mortality rate under general and local anaesthesia for pelvic colostomy in neonate.

### Methodology

This clinical trial was conducted at the Department of Paediatric Surgery of DMCH from January 2009 to

December 2010. A total number of 130 patients with high anorectal malformations (HARM) admitted in the hospital during this period. All had well developed sacrum and natal cleft, and weighed more than 3 Kg. Patients with associated anomalies, with poorly developed sacrum were excluded from the study and 72 patients underwent colostomy under G/A (Group A) and 58 patients underwent pelvic colostomy under L/A (Group B). All patients with HARM were admitted in Dept. of Paediatric Surgery through emergency. A clinical history was taken and detailed physical examination was performed. Routine investigations included complete blood examination and urine examination in all cases. Dehydration was corrected with ringer solution and the child was put on maintenance fluid with 10% dextrose saline at the rate of 100 -110 ml/Kg/ day. All neonates were given 1mg of vitamin K<sup>1</sup>. A nasogastric tube was passed to rule out oesophageal atresia with tracheo-oesophageal fistula and to relieve abdominal distension when present. All patients were put on broad spectrum antibiotics according to body weight. Specific investigations like prone cross table lateral film were performed 18-24 hours after birth only in cases of imperforate anus without fistula not having passed meconium in urine. Special investigations like ultrasonography, X-rays spine, X-rays chest, micturating

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cystourethrogram, magnetic resonance imaging and echocardiography were done in selected cases to exclude associated anomalies. After preoperative preparation and confirmation of diagnosis, sigmoid colostomy was performed under G/A in of Group A. In group B, sigmoid colostomy was performed under L/A. Postoperatively the patients were given intravenous fluids, broad spectrum antibiotics, and analgesics. Postoperatively nasogastric tube was removed on return of bowel sounds or when the patient passed flatus or stool. After colostomy functioning, stoma care and distal stomas were washed out with normal saline twice daily was taught to parents or caretaker and then discharged advising followed up. A detailed record was maintained during anesthesia to discharge. After collection of all data were plotted on Microsoft Excel. Analysis was done by SPSS version 17. The numerical and categorical data was presented as means and percentages. Two groups were compared by using a Chi square test.

## Results

Pelvic colostomy under G/A in seventy two patients (Group A) and under L/A in fifty eight patients (Group-B). In group A 40 patients were male and 32 patients were female and in group B 30 male patients and 28 female patients.

**Table 1: Distribution of sex among the study population**

Group	Male	Female	Total
Group-A	40	32	72
Group-B	30	28	58

A total number of 54(75%) patient was survived and 18(25%) patient death under G/A (Group-A) and 52 (89.7%) survived and 6 (10.3%) death under L/A (Group-B). So significant mortality rate under G/A than under L/A ( $p=0.05$ ).

**Table 2: showing the outcome of the operation**

Group	Survived	%	Death	%
Group-A	54	75%	18	25%
Group-B	52	89.7%	6	10.3%

## Discussion

Anorectal malformations encompass multiple congenital defects of urinary and/ or sexual structures with varying degrees of complexity that require different types of treatment. As a stage procedure at first colostomy is performed either under G/A or under L/A. At birth all system such as circulatory, respiratory, metabolic, excretory, musculo-skeletal system remains immature<sup>3</sup>. Newborns are very sensitive to anaesthetic agents and inefficient mechanisms of drug metabolism and elimination<sup>4</sup>. Mortality and morbidity rate of colostomy is very high in developing countries<sup>5</sup>. Most perioperative mortality is attributable to complications from the operation like haemorrhage, sepsis, and failure of vital

organs or pre-existing medical conditions. Most current estimates of perioperative mortality range from 1 death in 53 anaesthetics' to 1 in 5,417 anesthetics<sup>6,7</sup>. Mortality directly related to anaesthetic management is significantly less common, and may include such causes as pulmonary aspiration of gastric contents<sup>8</sup>, asphyxiation<sup>9</sup> and anaphylaxis<sup>10</sup>. These in turn may result from malfunction of anaesthesia-related equipment or more commonly, human error. A study was found that 82% of preventable anaesthesia mishaps were the result of human error<sup>11</sup>. As with perioperative mortality rates in general, the current mortality attributable to the management of general anaesthesia is controversial<sup>12</sup>. One of the common problems encountered in the treatment of ARM, is the care of colostomy which needs regular follow-up for care and management. As most of people are uneducated, they are unable to solve any problem at home. In this study a total number of 75% patient was survived and 25% patient death under G/A (Group-A) and 89.7% survived and 10.3% death under L/A (Group-B) ( $p=0.05$ ). The mortality rate in G/A Group (Group-A) was significantly higher than in the L/A Group (Group-B). The patients got rid of the problem immediately and this reduced the psychological pressure on the parents. This is the main advantage of colostomy<sup>13</sup>. Again child under G/A create more psychological pressure to parents rather than under L/A.

## Conclusion

Colostomy under local anaesthesia may be better and safer than general anaesthesia. More over in case of gross congenital problem where general anaesthesia is risky at that situation under local anaesthesia colostomy is possible. However more studies be needed to prove which is more suitable for neonate either G/A or L/A intern of mortality or morbidity.

## Acknowledgement:

I am very grateful to Prof. Dr. Md. Mahbul Alam, Professor & Head, Department of Paediatric Surgery, Dhaka Medical College & Hospital, Dhaka for his co-operation and suggestion during this study.

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