

# Original Article

## Management of Gastroschisis in a Tertiary Care Hospital

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### Abstract

**Background :** *Gastroschisis is a congenital abdominal wall defect with high mortality in developing countries. In developed countries their survival rate is more than ninety percent. This is due to appropriate information about the disease and adequate management plan. We have a good number of patients, but majority of us are lacking appropriate information about this disease.*

**Objectives:** *This study was done to give some information to our medical personals about this disease and to evaluate the out come of gastroschisis in relation to birth weight, age of neonate and procedure of closure of the defect.*

**Methodology:** *This prospective observational study was done in the surgery department of Dhaka Shishu Hospital (DSH) in a period of two years. All gastroschisis patients admitted during this period were enrolled and their mortality were analyzed in relation to weight, age and operative procedure. Minimal intervention management of gastroschisis (MIMG) were performed in suitable cases.*

**Results:** *A total of 32 patients were admitted. Mortality were significantly high among the VLBW babies than babies whose birth weight > 1500 gm (88.9% vs17.4%) and those who were admitted after 24 hours of age than who admitted before 24 hours of age (66.7% vs26.1%). Overall survival rate was 62.5% and after surgery 71.5%.*

**Conclusion:** *Gastroschisis is not rare in our population. Birth weight, early hospitalization with primary closure as early as possible, proper selection of patient for MIMG effect outcome. Adequate supportive measures like TPN, neonatal ICU and information about the disease will further increase the survival rate.*

**Key wards:** *Gastroschisis, survival rate*

### Introduction

Gastroschisis is the commonest ventral abdominal wall defect presenting as a neonatal emergency in any paediatric referral hospital.<sup>1,2,3,4</sup> In gastroschisis there is a congenital full thickness defect of the anterior abdominal wall, located almost always to the right of the umbilical cord, through which there is herniation of bowel loops and other organs into the exterior<sup>5</sup>. In this disease the bowel is usually thickened, matted, oedematous, shortened and covered with a fibrinous peel. This anomaly is accompanied by nonrotation of the bowel with ischemia or infarction.<sup>6</sup> In many instances at delivery no coagulum, oedema or

indurations is present in the gut.<sup>7</sup> These features appear after birth, because of venous obstruction and transudation of proteinaceous fluid.<sup>8</sup> Majority of babies with gastroschisis are born prematurely. Wide spread use of antenatal ultrasound examination and maternal serum alpha-fetoprotein screening has made detection of gastroschisis in second trimester of pregnancy<sup>9,10,11</sup>. Gastroschisis is a surgical emergency.<sup>12</sup>

The defect measures about 2 to 3 cm in diameter.<sup>13</sup> Primary fascial closure is the treatment, but in presence of severe visceroabdominal disproportion staged closure using prosthetic 'silo' can be life saving. Over the past three decades the outcome of babies with gastroschisis has dramatically improved.<sup>8</sup> Developed countries reported mortality rate of 5-10% for gastroschisis while developing countries reported mortality in excess of 60%.<sup>1,14,15</sup>

Bangladesh is a developing country. Our poor people has been suffering from many problems like- poverty,

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illiteracy, sanitation, transportation and many others. Within this situation if a baby born with any congenital defect like gasrtoschisis where the whole intestine remains outside of the body, they become afraid of and a negative attitude work to treat the baby considering the outcome and social harassment. Even our health workers and medical personals can not guide them in right way to treat the patient. This is due to lack of appropriate information about the disease. This study was carried out to provide some impute to our medical personals and paediatricians about the disease ; thereby they can provide initial management to these patients even in remote rural areas.

Secondly to see the outcome of our present protocol of primary closure as early as possible in a tertiary referral hospital and also minimal intervention management in suitable cases.

In future this study will also inspire our researchers to work more about the disease in our country.

**Materials and Methods**

A prospective study was conducted in surgery department of Dhaka Shishu (children) Hospital in a single unit from July 2008 to June 2010. During this period all admitted gastroschisis cases were enrolled. For each case proper history and examination were done which included – gestational age, weight, sex, systemic examination and examination of the lesion. On admission each patient were managed with passage of a nasogastric tube, intravenous fluid (quarter strength normal saline) and parental antibiotics.

Heat and water loss from the exposed organs were controlled by wrapping the lower trunk and intestine with moist warm gauze and plastic sheets. Supplementary oxygen was provided according to need of the patients. Vitamin K was also given to each patient.

After initial stabilization operative procedure was planned according to patient’s condition- like primary fascial closure- with or without formation of ventral hernia, stages procedure with formation of ‘ silo ‘ and Minimal intervention management for gastroschisis (MIMG). Assessments were made by surgeon and anesthesiologist combined. Those patients with very poor general condition and gasping were tried to manage conservatively with limited supportive measures in ward with supervision of neonatologists and surgeons together. MIMG were performed in six

cases considering their relatively good general condition, birth weight and minimum oedematous bowel loops.

During operation initial antiseptic wash followed by draping, stretching of the anterior abdominal wall muscles, milking of the intestinal contents into the stomach and aspiration through nasogastric tube were performed. Eviscerated organs were repositioned into the abdominal cavity with primary fascial closure of the abdominal wall. When excessive tension were noticed closure were performed making a ventral hernia. Three patients were managed with prosthetic ‘silo’ due to very small abdominal cavity with severe oedematous bowel loops.

Post operatively they were managed with nothing by mouth, nasogastric suction, oxygen inhalation, antibiotics, analgesics and parental intravenous fluid. Depending on improvement of general condition, bowel activity and investigation reports oral feed were started gradually and discharged from the hospital with follow up advices.

Patient’s out come (death or survival) were compared between the operative procedures andVLBW & LBW babies.

Data were processed and analyzed by using statistical package for social sciences 12 (SPSS 12) soft ware for windows. To compare mean values between groups  $\chi^2$  test were applied as appropriate.  $P < 0.05$  was considered as minimum level of significance.

**Results**

During the period of July 2008 to June 2010 a total of 32 patients with gastroschisis were admitted under surgery unit-I of DSH. Among them 23(71.9%) were male and 9(28.1%) were female with a ratio of 2.56:1

Out of 32 cases 2(6.3%) were extreme low birth weight babies, 7(21.9%) were very low birth weight and in 23(71.9%) cases weight were more than 1.5 kg (Fig-1)

None of the extreme low birth weight survived. Only one (14.3%) survived from very low birth weight group. Among the 23 patients 19(82.61%) patients were survived.(Table-I).

**Table-I**  
*Comparison between major two groups (n=32)*

Weight	Survived	Died	P value
<1500 gm	1	8	.000
>1500 gm	19	4	

Fisher’s Exact Test, Chi- Square =14.10

Outcome also related to age of baby on admission. Three(9.9%)babies came within 12 hours and all survived. Twenty (62.5%) patients came within 24 hours of delivery and 14(70%) survived. Nine (28.2%)cases presented after 24 hours and 3(33.4%) survived (fig. 2). Survival were significantly good in babies who came before 24 hours of age. (Table-II)

**Table-II**  
*Comparison between two major groups (n=32)*

Age at presentation	Survived	Died	P value
<24 H	17	6	0.04
>24 H	3	6	

Fisher's Exact Test, Chi- Square =4.545

Twenty eight(87.5%) patients underwent different operative procedures. Primary fascial closure with MIMG were performed in 6(21.5%) cases and 5 patients (83.4%) survived. Primary fascial closure with formation of ventral hernia were performed in 19(67.9%) cases. Fifteen (79%) patients survived. Stages procedure with formation of 'silo' were done in 3 patients and none could survive. (Table-III)

**Table -III**  
*Operative procedure with outcome (n=28)*

Operative procedure performed	Number with percentage	Out come
Primary fascial closure with MIMG	6 (21.5)	Survival-5(83.4%) Death-1
Primary closure with ventral hernia formation	19(67.9)	Survival-15(79%) Death-4
Stages procedure with 'silo'	3((10.6)	Death-3

Among the 28 patients, after surgery 20 (71.5%) survived and 8 (28.5%) died post operatively. (Table-IV)

In the total study patients 12 (37.5%) (4 preoperative +8 post operative) died and 20 (62.5%) survived. (Table-V)

**Table- IV**  
*Outcome after surgery (n=28)*

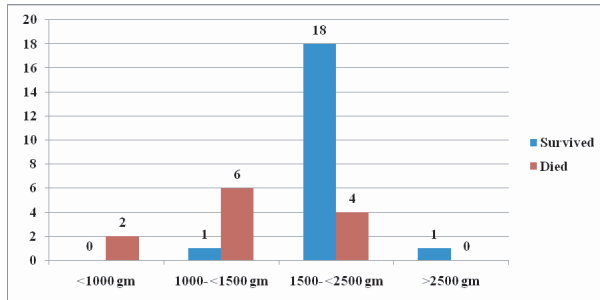
Outcome	Number	Percentage
survival	20	71.5
Death	8	28.5

**Table-V**  
*Total outcome (n=32)*

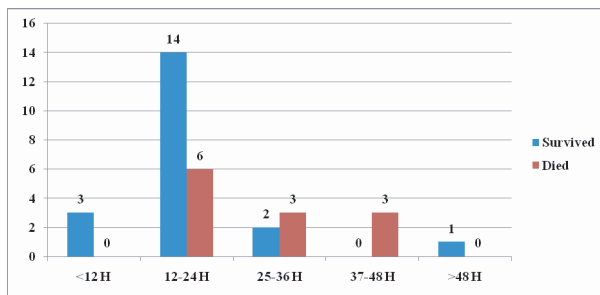
Out come	Number	Percentage
Survival	20	62.5
Death	12	37.5



*Pictures shows preoperative & postoperative views of gastroschisis*



**Fig.- 1:** Shows correlation between birth weight with survival (n=32)



**Fig.-2:** Shows age of presentation with survival (n= 32)

**Discussion**

Newborns with abdominal wall defects were reported in the first century AD by Aulus Cornelius, a Roman physician and then by Paulus Aegineta in the 5<sup>th</sup> century.<sup>16</sup> Lycosthenes may have been the first to describe gastroschisis in 16<sup>th</sup> century.<sup>17</sup> Taruff introduced the term gastroschisis in 1894.<sup>18</sup> In 1873 Visick described the successful repair of gastroschisis.<sup>19</sup>

Gastroschisis has become the most common of the abdominal wall defects over the last 30 years.<sup>1,2</sup> The incidence is about 2 to 4.9 per 1000 live birth with a male preponderance.<sup>1,20</sup> It has been reported that the incidence of gastroschisis has increased in recent years.<sup>21</sup>

There is an increased incidence when the mother has a history of cigarette smoking, use of recreational drugs, alcohol consumption, low body mass index, increased frequency of genitourinary infection.<sup>22,23,24,25,26,27</sup>

During our study period a total of 32 patients were admitted in our unit. Although the exact data is not available in our country still we can assume that it is not a rare disease in our population. Among these 32 patients 23 (71.9%) were male and 9 (28.1%) were female.

Gastroschisis in the fetus is probably associated with intrauterine distress. Even term babies with gastroschisis are more likely to be small for gestational age<sup>28,29,30</sup> and to have younger mothers<sup>31</sup> Birth weight and gestational age are strong indicators of mortality. Low birth weight increases the risk of mortality 40 to 600 times.<sup>32</sup> In our study we found low birth weight 22 (68.8%), very low birth weight 7 (21.9%), extreme low birth weight 2 (6.3%) and one normal birth weight patient. Among them highest 18(81.82%) patients survived from low birth weight group. Outcome were inversely related to the birth weight of the babies (fig.-1). For better comparison and statistical analysis we have divided the patients broadly into two groups-those having birth weight less than 1500 gm and more than 1500gm. From the first group only one patient survived (p=0.000).

In many cases at birth the eviscerated organs remain normal. Subsequently due to venous obstruction and transudation of proteinaceous fluid, which dries in room air, 6 causes extruded organs to be thickened, oedematous and matted together that individual loops can not be distinguished.<sup>8</sup> These changes make the primary closure more difficult with increasing the risk of death by many folds. In our study 23(71.9%) patients came within 24 hours of delivery, of them 17(73.9%) survived (p=0.04). Result is significant.

Three patients presented within 12 hours and all patients survived. Exceptionally one patient presented on the 3<sup>rd</sup> day of her life and survived after primary closure.

Twenty eight (87.5%) patients underwent operative treatment. Among them 19 (67.9%) patients underwent primary closure with formation of ventral hernia, of them 15(79%) survived. Primary fascial closure with MIMG were performed in 6 cases with the survival of 5 patients. Stages repair with 'silo' were performed in three cases with no survival.

We found the overall survival rate is 62.5% and after surgery the figure is 71.5%. Here we want to mention that this survival rate was absolutely on management of these patients in general paediatric ward where ventilatory support and TPN were not available.

In our short follow up care we found two patients with clear umbilical discharge and one patient with foecal fistula. All were managed conservatively.

## Conclusion

Gastroschisis is not rare in our population. Birth weight, early reach to the hospital where operative facilities are available, early closure with selection of patients for 'minimal intervention management' even in district hospital has significant role in the survival of these patients. Adequate supportive measures like TPN, neonatal ICU and increase awareness of our general people about this disease will further increase the survival rate significantly.

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