Background. Neonates with gastroschisis are expected to have better prognosis than omphalocele as the latter is commonly associated with other congenital anomalies. But in our centre, we experience the opposite scenario regarding outcome.

The aim of this study was to compare the outcome of these two conditions and to some extent to identify the factors influencing the consequences.

Methods. It was a prospective observational study done at Dhaka Shishu (Children) Hospital from June 2017 to November 2017. All neonates admitted with omphalocele and gastroschisis during the study period were included. Data were collected in a structured questionnaire.

Results. Total number of cases were 38 (24 omphalocele & 14 gastroschisis). None of the patients were antenatally diagnosed. Gender, mean birth weight, mean gestational age, maternal age and mode of delivery demonstrated incon siderable influence on the outcome. Out of 24 patients with omphalocele, in 20 patients, it was associated with other anomalies, and the other 4 patients died before evaluation. Mortality rate was significantly higher in gastroschisis (86%) than with omphalocele (42%).

Conclusion. Inadequate perinatal management contributes to the poorer prognosis of gastroschisis in our centre. Antenatal diagnosis, planned delivery and appropriate management in immediate post natal period can improve the result of these conditions.

Key words: Neonates, Omphalocele, Gastroschisis, outcome.
Introduction

Omphalocele and gastroschisis are the commonest among the anterior abdominal wall defects in newborns. These two anomalies exhibit different pathogenesis. In omphalocele, viscera herniate through umbilical ring with a membrane covering; while in gastroschisis, viscera herniate through a gap, usually to the right of the umbilical cord and not covered by membrane [1]. Gastroschisis usually presents as an isolated defect, though 10%–20% babies with this pathology have intestinal anomalies like atresia, volvulus, gangrene etc. These conditions are recognized as complicated gastroschisis and associated with dreadful prognosis [1-3]. Children with omphalocele are generally associated with other congenital abnormalities, particularly chromosomal and cardiac anomalies. These accompanying anomalies bear importance in determining the outcome of a patient with omphalocele [1,4]. The developed countries have been achieving greater success in managing these grave conditions through the improvement of perinatal care. However, babies with these congenital anomalies, still remain as notable causes of morbidity and mortality in developing countries [5]. Reports from developed countries showed higher morbidity and mortality among babies with omphalocele as this condition is often associated with other abnormalities [4,6,7]. As an isolated anomaly, neonates with gastroschisis are supposed to have a better consequence, but previous study from our centre and also from other developing countries, reflected worse outcome in babies with gastroschisis due to poor perinatal management [8].

Materials and methods

It was a prospective observational study held in Dha-ka Shishu (Children) Hospital from June 2017 to November 2017. All neonates admitted with omphalocele and gastroschisis during the study period were included. Demographic and clinical data were collected in a standard questionnaire. SPSS version 22 was used for statistical analysis. Continuous data were presented as mean ± SD and analysed by student t-test. Categorical data were presented as frequency and analysed by Chi square test. p value <.05 considered significant for both test.

Results

Total 38 patients were admitted with omphalocele and gastroschisis during these six months. Among them...
24 were with omphalocele and the rest of them with gastroschisis. Every mother had at least 1 ultrasound scan during pregnancy but fetal abnormality was unnoticed. Male babies were 55.26% (12 with omphalocele & 9 with gastroschisis), 44.74% were female (12 with omphalocele & 5 with gastroschisis). Mean birth weight was 2.62±58 kg in omphalocele and 2.17±27 kg in gastroschisis. Mean gestational age of babies with omphalocele & gastroschisis were 36.16±1.65 & 35.78±1.36 weeks respectively. Mean maternal age was 22±2.9 & 20±3.8 years in omphalocele and gastroschisis, respectively. Associated anomalies were present in 83.33% (20 out of 24) of neonates with omphalocele, the others died before evaluation. Babies with gastroschisis were not evaluated for associated anomalies. Mortality in gastroschisis was 85.71% (12 out of 14) and in omphalocele was 41.67% (10 out of 24).

Discussion

Dhaka Shishu (Children) Hospital is renowned as the largest specialized paediatric hospital in Bangladesh. We receive patients with omphalocele and gastroschisis referred from all over the country.

Increasing incidence of anterior abdominal wall defect has been reported around the world [4,5], however, in our country their prevalence has not been surveyed yet. An integrated protocol has become a crying need to provide quality care to these newborn babies.

Unfortunately, not a single baby was diagnosed during antenatal checkup, though every mother had at least one ultrasound scan during pregnancy. This result reflects inadequate exposure & experience of radiologists regarding these pathologies. Similar finding was reported in Nigeria by Abdur-Rahman L O et al. [5], while in developed countries, almost 100% cases are detected prenatally that contributes to the excellent outcome by optimizing the time & place of delivery and postnatal management [4,9,10].

Demographic data showed insignificant statistical difference between omphalocele & gastroschisis; however the mean birth weight in gastroschisis was lower. A larger sample size would have altered this finding to a statistically distinct one. Watanabe S et al found this difference noteworthy [7] in his study. Many authors identified low maternal age as a risk factor for gastroschisis [4,7,11,12]. However, our study identified the maternal age irrelevant, which precisely agrees with Abdur-Rahman LO et al. [5]

All of the babies with omphalocele, we could evaluate, were with cardiac anomalies (predominantly ASD & PDA). This is a common finding [1,4,7]. But in this study, the babies with omphalocele minor were noted to have associated intestinal anomalies. This phenomenon is not designated as a frequently observed one. Four babies with omphalocele major died before evaluation for cardiac anomalies. All of them had ruptured sac. Only one baby with gastroschisis had intestinal atresia. We could not investigate the babies with gastroschisis for associated anomalies as they died before evaluation.

Most of the neonates with omphalocele minor underwent primary repair as the content was small and there was associated intestinal anomalies. Nine cases of omphalocele major had non-operative management with escharosant initially as non-operative management of omphalocele major is encouraged in resource limited centres to avoid post operative complications arising from raised intra-abdominal pressure [5]. Sac was ruptured in one case among them and the patient could not survive after repair.

Almost all of the babies with gastroschisis presented to us more than 12 hours after delivery with exposed

| Table 3 | Treatment & mortality |
|---------|-----------------------|
| Omphalocele minor (n=11) | Omphalocele major (n=9) | Ruptured omphalocele (n=4) | Gastroschisis (n=14) | P |
| **Treatment** | Primary repair -10 | Escharosant – 9 | Reposition – 3 | Silo – 1 | Silo – 5 |
| **Mortality** | 4 | 2 | 4 | 12 | .01 |
oedematous viscera. The babies were hypovolemic, hypothermic, even in shock. Two babies died during resuscitation. After reposition of the gut, these babies developed respiratory failure and ultimately died as we do not have facilities for elective ventilation. Problem encountered in patients with ruptured omphalocele were not any different.

Previous study from same centre identified delayed presentation and inappropriate postnatal management along with limited resource are responsible for poor outcome of gastrochisis. Despite the fact that initial survival rate was significantly higher in patients with omphalocele, data regarding long-term survival and quality of life are yet to be investigated.

Moreover, deaths occurring at home and on the way to health facility due to these conditions are hardly recorded, which creates a hindrance to reach the goal of Every Newborn Action Plan (ENAP), launched by United Nations Children’s Fund (UNICEF), recommending counting of every birth as well as death is essential to reduce preventable neonatal death [13]. Much better data and identifying the factors contributing neonatal death are crucial to attain the ENAP target of less than 12 neonatal deaths per 1000 by 2030. Without encountering the prevalence of gastrochisis and omphalocele, it is highly unlikely to raise awareness and promote targeted actions which are indispensable for avoiding delayed management.

**Conclusion**

Incompetent antenatal investigations and lack of immediate postnatal care ensuing worse initial prognosis in gastrochisis compared to omphalocele, although it is often complicated by other congenital anomalies. Multidisciplinary integrated protocol is required for better outcome of gastrochisis and omphalocele.

**References**

1. Klein MD. (2012). Congenital defects of the abdominal wall. In: Coran AG, Adzick NS, Krummel TM, Laberge J, Shamberger RC, Caldamone AA (eds.). Pediatric Surgery. 7th ed. Elsevier, Philadelphia: 973-84.
2. Mutanen A, Koivusalo A, Pakarinen M. (2017, Oct 4). Complicated Gastrochisis Is Associated with Greater Intestinal Morbidity than Gastrochisis or Intestinal Atresia Alone. European Journal of Pediatric Surgery. doi: 10.1055/s-0037-1607198.
3. Bergholz R, Boettcher M, Reinshagen K, Wenzke K. (2014, Oct). Complex gastrochisis is a different entity to simple gastrochisis affecting morbidity and mortality—a systematic review and meta-analysis. J Pediatr Surg. 49(10): 1527-32. doi: 10.1016/j.jpedsurg.2014.08.001.
4. Kong JY, Yeo KT, Abdel Latif ME, Bajuk B, Holland AJ, Adams S et al. (2016). Outcomes of infants with abdominal wall defects over 18 years. Journal of Pediatric Surgery. 51: 1644-49.
5. Abdur-Rahman LO, Abdulrasheed NA, Adeniran JO. (2011). Challenges and outcomes of management of anterior abdominal defects in a Nigerian tertiary hospital. African Journal of Pediatric Surgery. 8(2): 159-63.
6. Hwang PJ, Kousseff BG. (2004). Omphalocele and gastrochisis: an18 year review study. Genetics in Medicine. 6(4): 232-36.
7. Watanabe S, Suzuki T, Hara F, Yasui T, Ōga N, Naoe A. (2017). Omphalocele and gastrochisis in newborns: over 16 years of experience from a single clinic. J Neonat Surg. 6: 27.
8. Hasan MS, Ferdous KMN, Aziz A, Ali A, Biswas PK. (2017). Outcome of Gastrochisis in a Developing Country: Where to Focus? Global Journal of Medical Research: I Surgeries and Cardiovascular System. 17(1): 24-28.
9. Quirk JG, Fortney J, Collins H B, West J, Hassad SJ, Wagner C. (1996). Outcome of newborns with gastrochisis: the effects of mode of delivery, site of delivery and interval from birth to surgery. American Journal of Obstetrics and Gynecology. 174: 1134-38.
10. Driver CP, Bianchi BA, Doig CM, Dickson AP, Bowen J. (2000). The contemporary outcome of gastrochisis. Journal of Paediatric Surgery. 35(12): 1719-23.
11. Rankin J, Dillon E, Wright C. (1999, Jul). Congenital anterior abdominal wall defects in the north of England, 1986-1996: occurrence and outcome. Prenat Diagn. 19(7): 662-8.
12. Loane M, Dolk H, Bradbury I et al. (2007, Jul). Increasing prevalence of gastrochisis in Europe 1980-2002: a phenomenon restricted to younger mothers? Paediatr Perinat Epidemiol. 21(4): 363-9.
13. Halim A, Dewaz JE, Biswas A, Rahman F, White S, van den Broek N. (2016, Aug 1). When, where, and why are babies dying? Neonatal death surveillance and review in Bangladesh. PLOS ONE. doi: 10.1371/journal.pone.0159388.