Scientific Research Publishing

Open Journal of Pediatrics, 2025, 15(4), 517-527
https://www.scirp.org/journal/ojped
ISSN Online: 2160-8776
ISSN Print: 2160-8741

Predictors of Mortality in Neonates with Congenital Anterior Abdominal Wall Defects: A Twelve-Year Review of Records in a Tertiary Health Centre

Andrew Haruna Shitta*, Ezekiel Dido Dung, Solomon Danjuma Peter, Daanan Joseph Shilong, Linus Anthony, Uche Agwu Arua, Victor Ibukun Imade, Elijah Danladi Wuyep, Godwin Oko Adariku, Abraham Isha Ashom, Mercy Wakili Isichei, Francis Aba Uba, Lofha Bali Chirdan

Department of Surgery, Jos University Teaching Hospital, Jos, Nigeria
Email: *shittosis@yahoo.co.uk

How to cite this paper: Shitta, A.H., Dung, E.D., Peter, S.D., Shilong, D.J., Anthony, L., Arua, U.A., Imade, V.I., Wuyep, E.D., Adariku, G.O., Ashom, A.I., Isichei, M.W., Uba, F.A. and Chirdan, L.B. (2025) Predictors of Mortality in Neonates with Congenital Anterior Abdominal Wall Defects: A Twelve-Year Review of Records in a Tertiary Health Centre. *Open Journal of Pediatrics*, **15**, 517-527.
https://doi.org/10.4236/ojped.2025.154049

Received: May 17, 2025
Accepted: July 11, 2025
Published: July 14, 2025

Abstract

Background: Anterior abdominal wall defect is a spectrum of congenital malformations arising from defective fusion or development of the embryonic folds. Gastroschisis and omphalocele constitute the majority of cases. **Methods:** A retrospective study of newborns with anterior abdominal wall defects at our facility from February 2012 to June 2023. **Results:** A Total of 142 newborns presented with anterior abdominal wall defects. Females 74 and males 68, ratio of 0.9:1. Median age at presentation was 18.5 hours. Mean birth weight was 2.6 ± 0.6 kg, range of 1.1 kg - 4.2 kg. There were 120 (83.8%) newborns with omphalocele, 14 (9.9%) with gastroschisis, prune belly 3 (2.1%), bladder exstrophy, cloacal exstrophy, a set of conjoined twins and pentalogy of Cantrell 1 (0.7%) each. Of the 120 with omphalocele, 107 were omphalocele major, 13 omphalocele minor while 45 (37.5%) presented with ruptured membrane. Complication: sepsis (38, 26.7%). Length of hospital stay 0.2 days - 63 days, mean of 15 days. Mortality 62 (43.7%), treated and discharged home 80 (56.3%). Of the 62 mortalities, 45 (72.6%) occurred in week one. Case fatality rate: pentalogy of Cantrell 1(100%), Gastroschisis 13 (92.85%) and omphalocele major 44 (41.1%). Of the 44 mortalities with omphalocele major, 26 (51.1%) had ruptured membranes. Logistic regression: birth weight (OR = 0.209, CI = 0.083 - 0.525, p = 0.001); Duration of hospital stay (OR = 0.287, CI = 0.287 - 9.985, p < 0.001) and type of defect (OR = 0.449, CI = 0.276 - 0.731, p = 0.001) significantly predicted mortality. **Conclusion:** Low birth weight and type of defect (ruptured omphalocele and gastroschisis) were significant predictors of mortality.

Keywords

Predictors, Mortality, Neonates, Abdominal-Wall, Defects

1. Introduction

Anterior abdominal wall defect is a spectrum of congenital malformations arising from defective fusion or development of the embryonic folds [1]. These include—omphalocele, gastroschisis, ectopia cordis, bladder exstrophy, exstrophy complex, limb-body wall complex, body stalk anomaly, amniotic band syndrome, and prune belly syndrome. These defects could present with the least morbidity, such as in a bifid clitoris, to the most severe morbidity, such as seen in cloacal exstrophy and pentalogy of Cantrell. The incidences of these malformations vary depending on the type of defect, with gastroschisis occurring in 1:2000 live births, followed by omphalocele with the incidence of 1:4000 live births [2] [3].

Anterior abdominal wall defects present a conundrum of management decisions to the surgeon and with varying outcomes depending on so many factors. Studies have evaluated the management decisions that offer the best possible outcomes [4]. These outcome measures include length of hospital stay, duration of use of mechanical ventilators, and dependence on parenteral nutrition [5]. Survival is well above 90% in developed nations. In the developing world, however, with a severe lack of supportive equipment like mechanical ventilators and parenteral nutrition, outcomes are measured based on survival, which is abysmal, ranging from 50% to 0% [6]-[8].

Studies have shown that survival in newborns with anterior abdominal wall defects is a function of many factors, which include the type of defects, associated chromosomal, cardiac defects, and sepsis [9] [10]. Mortality is higher in syndromic omphalocele major with associated chromosomal abnormalities, as against simple non-syndromic omphalocele [11] [12]. Complex gastroschisis has a relatively higher mortality than simple gastroschisis [12] [13]. Sepsis is another significant factor in mortality. However, in low- and middle-income countries (LMICs) like our setting, where facilities for chromosomal analysis, cardiac evaluation, nutritional support and mechanical ventilator are not readily available, mortality is still very high [7] [14].

Patient, maternal, and management variables predicting mortality among neonates with anterior abdominal wall defects have not been fully investigated in our setting. This study aimed to look at these variables that could predict mortality in our environment. The findings could offer guidance to clinicians, health managers, and policy makers in designing measures geared toward reducing mortality in newborns with anterior abdominal wall defects.

2. Materials and Methods

2.1. Study Design and Definition of Terms

This is a retrospective study carried out at the Jos University Teaching Hospital.

Our facility received patients with congenital anomalies from 5 neighboring states. Ethical clearance was obtained, and data from case notes of all newborns managed with anterior abdominal wall defects were retrieved and reviewed.

Inclusion

All newborns managed in our paediatric surgical unit from February 2012 to June 2023 for anterior abdominal wall defects were included in this study.

Exclusion

Patients who were discharged against medical advice were excluded because their contact was not available, and we could not follow them up for the primary outcome.

Terms

A ruptured omphalocele was considered when the membrane was breached, eviscerating its contents at presentation.

Length of hospital stay (LOS) was defined as the duration from admission to discharge or demise.

2.2. Management Protocol

Patients were received through the emergency paediatric unit and immediately handed over to a neonatologist, and the paediatric surgical units were on call at the Special Baby Care Unit (SCBU). Babies were reviewed in a prewarmed (at 35˚C for term neonates and 36˚C for preterm and regulated base on the neonate's response) incubator or thermoneutral cubicle with radiant warmer. General physical examinations were done, all vital signs obtained, degree of hydration assessed, and type of defect determined, while resuscitative measures were also being instituted.

These measures included intranasal oxygen via nasal prongs at 0.5 l/min for those with a saturation level of 95% and above and 1 l/min for those with less than 95% oxygen saturation. Blood sample is taken for urgent blood sugar, hypoglycemia patients were treated with 4 mls/kg of 10% dextrose given bolus and maintained with 8%dextrose. If severely dehydrated babies were given a normal saline bolus of 20 mls /kg until urine output was at least 1mls/kg, then maintained at 100 to 180 mls/kg/day, making sure urine output was between 1 - 3 mls/kg/hr. Intravenous broad-spectrum antibiotics (ceftriaxone 50 mg/kg, 12 hourly and metronidazole 7.5 mg/kg/dose 8 hourly) were commenced after fluid resuscitation. All patients were placed on intravenous potassium chloride maintenance at 1.5 mmol/kg/day until commencement of oral feeds.

All patients had their defects covered with sterile gauze soaked in warm saline. For those with ruptured omphalocele or gastroschisis, nasogastric tube for decompression and improvised silo using female condom was inserted in the SCBU without anesthesia following sterile procedure protocols. The bowel was serially reduced into the abdomen until ready for skin/facial closure in the theatre under general anesthesia. Omphalocele with intact membranes had daily wound dressing with honey until full epithelialization.

Statistical analysis

Data was entered into an Excel spreadsheet with all the variables for both mother and baby. IBM SPSS version 25.0 Chicago USA statistical software was used to analyse the data.

Analysis included descriptive statistics for demographics and clinical variables information (sex, age, birth weight, type of defect, length of hospital stay, maternal age, parity.

Maternal and patient variables were then subjected to bivariate analysis to analyse the strength of association between these variables and mortality as an outcome measure. Those associations that were found to be statistically significant were further subjected to logistic regression to check for the likelihood of these variables to predict mortality.

3. Results

A total of 142 newborns presented to our facility with anterior abdominal wall defects. Females were 74 and males 68, with a male-to-female ratio of 0.9:1. There were 113 (79.58%) booked pregnancies and 29 (20.42%) unbooked. The median age at presentation was 18.5 hours while the mean birth weight was 2.6 ± 0.6 kg. Median weight was 2.7 kg. Their ages ranged from 1.1 kg to 4.2 kg. There were 120 (83.8%) newborns with omphalocele, 14 (9.9%) with gastroschisis, prune belly 3 (2.1%), bladder exstrophy, cloacal exstrophy, a set of conjoined twins and a pentalogy of Cantrell 1 (0.7%) each. Of the 120 with omphalocele, 107 were omphalocele major, 13 omphalocele minor and 45(37.5%) presented with ruptured membrane. The complication recorded was only sepsis in 38,26.7%. The length of hospital stay ranged from 0.2 days to 63 days, with a mean of 15 days. Those who were discharged home had a mean length of hospital stay of 21.7 days while the mean length of stay for those who died was 6.1 days. There were 62, 43.7% mortalities in the study group while 80, 56.3% were treated and discharged home.

Out of the 62 mortalities, 45 (72.6%) occurred within the first week of admission. The mean length of hospital stays and birth weight in this group who died within the first week were 3.5 days and 2.3 kg, respectively.

There were 49 (34.5%) neonates with low birth weight. Out of this, 39 (79.6%) were products of booked pregnancy (at primary healthcare 11, 30%, private facility 5, 11% and secondary and tertiary healthcare centres 23, 59%). Among the low birth weight babies, the mean gestational age was 32 weeks, with a range of 28 - 36 weeks. Mortality among the booked low birth weight pregnancies was 29, 74.36% (among booked primary healthcare centres 11, 72.2%, private facilities 3, 60% and secondary and tertiary healthcare centres 18, 78.26%). Case fatality rates were: pentalogy of Cantrell 1 (100%), Gastroschisis 13 (92.85%) and omphalocele major 44 (41.1%) (see **Figure 1**).

Of the 44 mortalities with omphalocele major, 26 (51.1%) had ruptured membranes.

Using bivariate analysis, Birth weight ($p < 0.001$), Type of defect ($p = 0.001$),

Maternal age (p = 0.002) and length of hospital stay (p < 0.001) were significantly associated with mortality (see Table 1).

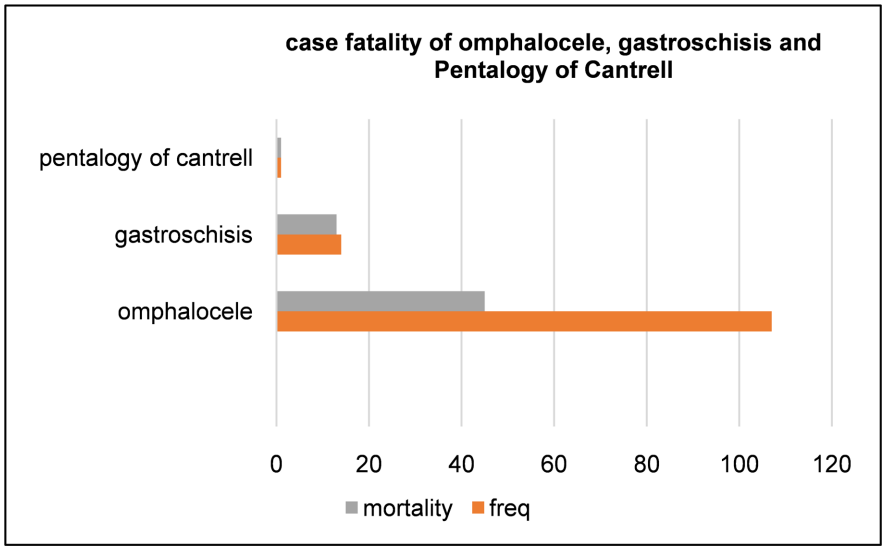

Figure 1. Bar chart showing case fatality rates.

Table 1. Relationship between newborn/maternal variables and outcome (mortality).

Variables	Outcome			χ^2	p
	Home	Died	Total		
Age at presentation (hours)				5.984	0.121f
1 - 6	20 (47.6)	22 (52.4)	42 (100.0)		
7 - 12	8 (40.0)	12 (60.0)	20 (100.0)		
13 - 23	8 (61.5)	5 (38.5)	13 (100.0)		
≥24	44 (65,7)	2 (43.3)	67 (100.0)		
Total	80 (56.3)	62 (43.7)	142 (100.0)		
Sex				3.714	0.054
Male	44 (55.0)	24 (38.7)	68 (47.9)		
Female	36 (45.0)	38 (61.3)	74 (52.1)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		
Birth weight (kg)				18.554	0.001
<2.50 kg	15 (31.3)	33 (68.8)	48 (100)		
≥2.5 kg	65 (77.5)	29 (46.8)	94 (64.1)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		

Continued

Type of defect				3.248	0.072
Ruptured omphalocele	63 (85.1)	44 (95.7)	107 (89.2)		
Omphalocele intact	11 (69.9)	2 (30.9)	13 (10.8)		
Total	74 (100.0)	46 (100.0)	120 (100.0)		
Omphalocele				10.813	0.001
Intact	54 (74.0)	21 (44.7)	75 (62.5)		
Ruptured	19 (26.0)	26 (55.3)	45 (37.5)		
Total	73 (100.0)	47 (100.0)	120 (100.0)		
Sepsis				2.197	0.138
no	63 (78.8)	42 (67.7)	105 (73.9)		
yes	17 (21.2)	20 (32.3)	37 (26.1)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		
Maternal age				17.750	0.002f
<20	7 (8.8)	7 (11.3)	14 (9.9)		
20 - 24	12 (15.0)	27 (43.5)	39 (27.5)		
25 - 29	27 (33.8)	10 (16.1)	37 (26.1)		
30 - 34	21 (26.3)	10 (16.1)	31 (21.8)		
35 - 39	12 (15.0)	6 (9.7)	18 (12.7)		
≥40	1 (1.3)	2 (3.2)	3 (2.1)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		
Maternal parity				6.747	0.150
1	23 (28.8)	29 (46.8)	52 (36.6)		
2	18 (22.5)	12 (19.4)	30 (21.1)		
3	18 (22.5)	8 (12.9)	26 (18.3)		
4	9 (11.3)	3 (4.8)	12 (8.5)		
≥5	12 (15.0)	10 (16.1)	22 (15.5)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		
Length of hospital stay				76.388	<0.001
≤1	2 (2.5)	7 (11.3)	9 (6.3)		
2 - 10	10 (12.5)	48 (77.4)	58 (40.8)		
11 - 19	28 (35.0)	3 (4.8)	31 (21.8)		
20 - 29	23 (28.8)	3 (4.8)	26 (18.3)		
≥30	17 (21.3)	1 (1.6)	18 (12.7)		
Total	80 (100.0)	62 (100.0)	142 (100.0)		

These variables were further subjected to logistic regression which revealed that birth weight (OR = 0.209, CI = 0.083 - 0.525, p = 0.001); Duration of hospital stay (OR = 0.287, CI = 9.985, p < 0.001) and type of defect (OR = 0.449, CI = 0.276 - 0.731, p = 0.001) significantly predicted mortality. Although mortality increased with sepsis, the difference was not statistically significant (OR=1.765, CI=0.829 - 3.756, p = 0.141) (Table 2).

Table 2. Logistic regression showing the p values and odd ratios of both maternal and neonatal variables in relation to mortality.

Variables in the equation	B	p-value	OR	95% C.I. for EXP(B)	
				Lower	Upper
Neonatal age (hrs.)	−0.008	0.234	0.817	0.585	1.001
Sex	−0.599	0.372	0.549	0.148	2.046
Weight (kg)	−1.883	**0.001**	0.209	0.083	0.525
Maternal age (years)	0.001	0.986	1.001	0.882	1.137
Parity	0.292	0.222	1.339	0.838	2.138
Length of hospital stay (days)	−0.246	**0.000**	0.287	0.287	9.985
Type of defect	−3.329	**0.001**	0.449	0.276	0.731
Sepsis	0.568	0.141	1.765	0.829	3.756

4. Discussion

In our study population, birth weight, type of defect, and duration of hospital stay were significant predictors of mortality. Maternal age was significantly associated with mortality, but was not a significant predictor of mortality.

Mortality was highest in newborns with low birth weight and gestational age of less than 37 weeks. This may be attributed to the various complications associated with low birth weight, which include hypothermia, sepsis, and the associated congenital anomaly. According to the World Health Organisation's global report on preterm birth, 2012, low birth weight newborns have a higher risk of dying [15]. Another study in Nigeria also found that mortality was high in newborns with low birth weight [16]. Biswas I *et al.* in Bangladesh, however, had a different outcome, survival was higher in term and normal birth weight babies, although they noted it was not statistically significant [17]. However, a study carried out in a level III NICU in Japan found that mortality was just 11% among low birth weight babies [18]. This improved survival outcome compared to our study could be due to access to the high-level care given to these patients.

Antenatal care: The majority of the pregnancies were booked. Among the low birthweight and preterm babies, we found that more than 2/3rd were booked pregnancies. However, getting booked did not translate to improved survival. Anterior

abdominal wall defects can be diagnosed prenatally [19] [20]. Prenatal diagnosis can guide tailored management and improve survival. The reason for the high mortality rate among booked pregnancies in our study could be due to poor implementation of an antenatal protocol for early detection of congenital anomalies.

The Type of defect was also found to be a significant predictor of mortality in the study group. Mortality was mainly in newborns with ruptured omphalocele and gastroschisis. Exposure of the bowel while moving from one facility to another could have increased their risk of hypothermia, fluid and electrolyte loss, and sepsis. Bowel function could have also been compromised, while this could have been easily overcome with parenteral nutrition, it is not readily available. In a poorly equipped neonatal intensive care unit, the outcome was likely to be poor.

In our previous study the use of improvised preformed silo (femidom) had reduced mortality in ruptured omphalocele and gastroschisis from 100% to 50% [6]. Similar studies in Africa found mortality in newborns with gastroschisis to be abysmally high (70% - 100%). They found that, lack of prenatal diagnosis and an inadequately equipped neonatal intensive care increased the risk of dying [7] [14]. The use of improvised silo alone is not enough to reduce mortality. This is in contrast to developed nations, where mortality is as low as 0% - 2% [5]. Ruptured omphalocele complicates management, increases morbidity, and contributes to the significantly high mortality rate in these patients [21].

Although mortality increased in newborns with sepsis, there was no significant correlation between sepsis and mortality in this study. Although other studies have found sepsis to be the primary cause of death in these patients [22].

Length of hospital stay was a significant predictor of mortality. Mortality was highest within the first week of admission, and patients who lived beyond 2 weeks were most likely to survive. Although the majority of our patients presented to our facility relatively early within the first 10 hours after birth and received the same resuscitative measures, mortality remained high in the first week. This emphasizes the need for prompt intervention immediately after birth,

Age at presentation, sex, Maternal parity, and maternal age did not predict mortality in our study. A study by Schimmel *et al.* reported a similar finding, that maternal age and parity did not affect mortality, but it was associated with small for gestational age babies, and preterm delivery [23]. In their study, however, Kazuki *et al.* reported that maternal age and parity were associated with small for gestational age, preterm delivery, and mortality [24]. The difference in our study could be the variations in the ages and parity of mothers in the study groups. Similar age and parity may produce similar results.

5. Conclusion

Our finding of low birth weight and type of defect (ruptured omphalocele and gastroschisis) as significant predictors of mortality, emphasises the need to improve our antenatal care services for prenatal diagnosis and provision of neonatal intensive care could reduce mortality.

6. Limitations

1) Being a retrospective study, some data on the extent, compliance, and skills of attending health personnel among booked pregnant mothers could not be accessed.

2) Resource limitation: Lack of adequately equipped intensive care unit and parenteral nutrition which could impact outcome.

3) In ability to evaluate for other confounders like chromosomal abnormalities and cardiac defects that could influence outcomes.

These limitations could have had an impact on the outcome of our study. A prospective study taking into consideration these limitations would have reduced bias.

Conflicts of Interest

The authors declare no conflicts of interest regarding the publication of this paper.

References

[1] Glasser, J.G. (2019) Pediatric Omphalocele and Gastroschisis (Abdominal Wall Defects). https://emedicine.medscape.com/article/975583-overview

[2] (2024) Data and Statistics on Birth Defects. Centers for Disease Control and Prevention. https://www.cdc.gov/birth-defects/data-research/facts-stats/

[3] Keppler-Noreuil, K.M., Conway, K.M., Shen, D., Rhoads, A.J., Carey, J.C., Romitti, P.A. and National Birth Defects Prevention Study (2017) Clinical and Risk Factor Analysis of Cloacal Defects in the National Birth Defects Prevention Study. *American Journal of Medical Genetics Part A*, **173**, 2873-2885. https://doi.org/10.1002/ajmg.a.38469

[4] Bence, C.M. and Wagner, A.J. (2021) Abdominal Wall Defects. *Translational Pediatrics*, **10**, 1461-1469. https://doi.org/10.21037/tp-20-94

[5] Lee, R., Dassios, T., Ade-Ajayi, N., Davenport, M., Hickey, A. and Greenough, A. (2024) Predictors of Outcomes in Infants with Gastroschisis Treated with a Preformed Silo. *Pediatric Surgery International*, **41**, Article No. 22. https://doi.org/10.1007/s00383-024-05922-7

[6] Shitta, A.H., *et al.* (2020) Ruptured Omphalocele and Gastroschisis: An 8 Year Experience with the Use of Female Condom (Femidom) as an Improvised Silo. *IOSR Journal of Dental and Medical Sciences* (*IOSR-JDMS*), **19**, 38-43.

[7] Utama Putri, D. and Ponco Wibowo, Y. (2024) Prevalence, Management and Outcome of Gastroschisis: A Comprehensive Systematic Review. *Journal of Advanced Research in Medical and Health Science* (*ISSN* 2208-2425), **10**, 400-407. https://doi.org/10.61841/jghz5x97

[8] Rahayatri, T.H., Gunardi, H.D., Amin, R.B.M. and Tamba, R.P. (2024) Gastroschisis Survival Improvement and Early Intervention: Experience in a Developing Country. *Paediatrica Indonesiana*, **64**, 264-269. https://doi.org/10.14238/pi64.3.2024.264-9

[9] O'Connell, R.V., Dotters-Katz, S.K., Kuller, J.A. and Strauss, R.A. (2016) Gastroschisis: A Review of Management and Outcomes. *Obstetrical & Gynecological Survey*, **71**, 537-544. https://doi.org/10.1097/ogx.0000000000000344

[10] Conner, P., Vejde, J.H. and Burgos, C.M. (2018) Accuracy and Impact of Prenatal Diagnosis in Infants with Omphalocele. *Pediatric Surgery International*, **34**, 629-633.

https://doi.org/10.1007/s00383-018-4265-x

[11] Nembhard, W.N., Bergman, J.E.H., Politis, M.D., Arteaga-Vázquez, J., Bermejo-Sánchez, E., Canfield, M.A., *et al.* (2020) A Multi-Country Study of Prevalence and Early Childhood Mortality among Children with Omphalocele. *Birth Defects Research*, **112**, 1787-1801. https://doi.org/10.1002/bdr2.1822

[12] Raymond, S.L., Hawkins, R.B., Peter, S.D.S., Downard, C.D., Qureshi, F.G., Renaud, E., Islam, S., *et al.* (2020) Predicting Morbidity and Mortality in Neonates Born with Gastroschisis. *Journal of Surgical Research*, **245**, 217-224. https://doi.org/10.1016/j.jss.2019.07.065

[13] Brebner, A., Czuzoj-Shulman, N. and Abenhaim, H.A. (2020) Prevalence and Predictors of Mortality in Gastroschisis: A Population-Based Study of 4803 Cases in the USA. *The Journal of Maternal-Fetal & Neonatal Medicine*, **33**, 1725-1731.

[14] Wesonga, A.S., Fitzgerald, T.N., Kabuye, R., Kirunda, S., Langer, M., Kakembo, N., *et al.* (2016) Gastroschisis in Uganda: Opportunities for Improved Survival. *Journal of Pediatric Surgery*, **51**, 1772-1777. https://doi.org/10.1016/j.jpedsurg.2016.07.011

[15] Biswas, I., Sultana, S., Jahan, N. and Huq, U. (2024) Factors Influencing the Survival of Patients with Gastroschisis in A Lower-Middle Income Country: A Retrospective Observational Study. *Clinical Research*, **1**, 22-27.

[16] Chidiebere, O.D., Uchenna, E., NduIkenna, K., Christian, I., Nwabueze, A.I., Amadi-Ogechukwu, F., *et al.* (2018) The Low-Birth Weight Infants: Pattern of Morbidity and Mortality in a Tertiary Healthcare Facility in the South Eastern Nigeria. *Annals of Medical and Health Sciences Research*, **8**, 4-10

[17] Biswas, I., Sultana, S., Jahan, N. and Huq, U. (2024) Factors Influencing the Survival of Patients with Gastroschisis in A Lower-Middle Income Country: A Retrospective Observational Study. *Clinical Research*, **1**, 22-27.

[18] Kusuda, S., Fujimura, M., Sakuma, I., Aotani, H., Kabe, K., Itani, Y., *et al.* (2006) Morbidity and Mortality of Infants with Very Low Birth Weight in Japan: Center Variation. *Pediatrics*, **118**, e1130-e1138. https://doi.org/10.1542/peds.2005-2724

[19] Agarwal, R. (2005) Prenatal Diagnosis of Anterior Abdominal Wall Defects: Pictorial Essay. *Indian Journal of Radiology and Imaging*, **15**. https://link.gale.com/apps/doc/A158965138/HRCA?u=anon~443ff1c0&sid=google-Scholar&xid=7816f885

[20] Barisic, I., Clementi, M., Haeusler, M., Gjergja, R., Kern, J. and Stoll, C. (2001) Evaluation of Prenatal Ultrasound Diagnosis of Fetal Abdominal Wall Defects by 19 European Registries. *Ultrasound in Obstetrics and Gynecology*: *The Official Journal of the International Society of Ultrasound in Obstetrics and Gynecology*, **18**, 309-316. https://doi.org/10.1046/j.0960-7692.2001.00534.x

[21] Gonzalez, K.W. and Chandler, N.M. (2019) Ruptured Omphalocele: Diagnosis and Management. *Seminars in Pediatric Surgery*, **28**, 101-105.

[22] Habtamu, A. and Million, T. (2024) Anterior Abdominal Wall Defects and Their Management Outcomes in Tikur Anbessa Specialized Hospital, Neonatal Intensive Care Unit. *JPGN Reports*, **5**, 433-437. https://doi.org/10.1002/jpr3.12110

[23] Schimmel, M.S., Bromiker, R., Hammerman, C., Chertman, L., Ioscovich, A., Granovsky-Grisaru, S., Samueloff, A. and Elstein, D. (2015) The Effects of Maternal Age and Parity on Maternal and Neonatal Outcome. *Archives of Gynecology and Obstetrics*, **291**, 793-798.

[24] Kozuki, N., Lee, A.C., Silveira, M.F., *et al.* (2013) The Associations of Parity and Ma-

ternal Age with Small-For-Gestational-Age, Preterm, and Neonatal and Infant Mortality: A Meta-Analysis. *BMC Public Health*, **13**, Article No. S2.
https://doi.org/10.1186/1471-2458-13-S3-S2