Quest Journals
Journal of Medical and Dental Science Research
Volume 13~ Issue 6 (June 2026) pp: 33-42
ISSN(Online): 2394-076X ISSN (Print):2394-0751
www.questjournals.org

Research Paper

Neonatal Surgical Admissions: Burden And Management Outcome in Jos, Nigeria.

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ABSTRACT

Introduction

Neonatal surgical pathologies are a global disease burden that contribute significantly to neonatal morbidity and mortality. The aim of the study is to demonstrate the burden of neonatal surgical admissions in our facility and determine the neonatal and maternal factors that contribute significantly to neonatal mortality.

Materials and methods

This is a 6 years retrospective study of surgical neonates admitted into the Special Baby Care and the Postnatal ward of the Jos University Teaching Hospital from January 2013 to December 2018. Data were extracted from case notes and discharge summaries. The patients were observed for age at presentation, gender, gestational age, weight, system involved, diagnosed pathology, associated congenital malformations, maternal age, maternal parity, performed surgical procedures management complications and outcome of management were assessed.

Results

A total of 3,468 neonates were admitted and 299(11.6%) were surgical neonates with M:F=1.74:1 and mean age of presentation of 92.144 hours(S.D=127.4253). Majority (55.2%) presented early. The mean weight was 2.941Kg(S.D=0.3384) and 8.4% weigh <2.5Kg.Preterm were 8.4%.Congenital malformations accounted for the majority (95.7%) of the surgical neonates. The mean maternal age was 27.75 years(S.D=5.954). The gastrointestinal system was the major (55%) system involved. Myelomeningocele was the major (23%) congenital malformation. Surgical procedures were performed on 46.2% of the surgical neonates and divided sigmoid colostomy was the major (20.1%) procedure performed. Management complications were seen in 24.4% and sepsis was the major (43.4%) complication. ***Prematurity*** *[OR 0.259;95%CI(0.506-1.532),* ***p=0.001****],* ***associated congenital malformations*** *[OR 2.687;95%CI(1.161-6.216),* ***p=0.017****] and* ***low birth weight*** *[OR 0.259;95%CI(0.112-0.597),* ***p=0.001****] were statistically significant predictors of management complications Mortality was seen in 20.7% and* ***gestational age*** *[OR 0.242;95%CI(0.104-0.561),* ***p= 0.000****],* ***associated congenital malformations*** *[OR 2.346;95%CI(0.983-5.598),* ***p=0.049****],* ***weight*** *[OR 0.242;95%CI(0.104-0.561)* ***p=0.000****],* ***prematurity*** *[OR 0.512;95%CI(0.282-0.931),* ***p=0.027****],* ***associated complications*** *[OR 38.768;95%CI(18.079-83.133),* ***p=0.000****],* ***associated sepsis*** *[OR 10.020;95%CI(5.007-20.049),* ***p=0.000****], and* ***hypothermia*** *[OR 27.738;95%CI(9.026-85.241),* ***p=0.000****] were statistically significant predictors of mortality.*

Conclusion

Congenital malformations are the major neonatal surgical pathologies. The gastrointestinal system was the commonest system. Myelomeningoceles were the commonest pathology. Surgical procedures were carried in 46.2% and divided sigmoid colostomy was the commonest procedure. Management complications were seen in 24.4% and sepsis was the major complication. Prematurity, associated congenital malformations and low birth weight were the statistically significant predictors of management complications. The mortality was 20.7%. Gestational age, associated congenital malformations, low birth weight, prematurity, associated complications, associated sepsis and associated hypothermia were the statistically significant predictors of mortality.

Key words: *Neonatal surgical, surgical neonate, congenital malformations, burden, myelomeningoceles, divided sigmoid colostomy, management complications, outcome, mortality.*

*Received 10 June., 2026; **R**evised 18 June, 2026; **A**ccepted 20 June., 2026 © The author(s) 2026.*
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I. INTRODUCTION

Neonatal surgical pathologies (surgical neonates) are a global disease burden. They occur 1 in 5,000 live births and contribute significantly to neonatal morbidity and mortality[1]. They constitute 6.2% - 12.8% of the total neonatal hospital admissions and present a serious management challenge[2]. Worldwide, more than 4 million neonates die annually with more than 98% in the developing nations[3]. Surgical neonates generally account for 11.8% of the total neonatal deaths in hospitalized neonates[3,4,5,6]. Cameroun and Nigeria recorded higher rates of 48% and 62.2% respectively[1]. This continues to be a large component of the disease burden in Sub-Saharan Africa[7]. The management outcome of surgical neonates varies globally and most of the causes of mortality in the developing nations are preventable[8]. Globally, 50% of all congenital anomalies are surgical pathologies and they account for the majority (89%) of the neonatal surgical admissions. Most (94%) congenital anomalies occur in low-and-medium-income countries[1,2,6]. The WHO attributed congenital malformations to cause about 10% of neonatal deaths in Sub-Saharan Africa and South Asia. Optimal neonatal care can avoid at least two-third neonatal deaths[9,10]. Neonates have a wide divergence in their anatomy, physiology, metabolism, immunity and response to stress. The adjustment to postnatal life is a stressful event. Surgical illnesses dysregulate neonatal metabolism and can predispose to malnutrition, surgical site infection, sepsis and the need for a post-operative ventilation[1,2,11,12]. Generally, prematurity, low birth weight, malnutrition and asphyxia are the principal factors that contribute to neonatal mortality[1,3,7,8]. Currently, steady improvement in management outcome of surgical neonates has been demonstrated in developing nations. This was attributed to the technological advancement in prenatal diagnosis; anesthetic and surgical techniques; early hospital presentation; better understanding of the neonatal physiology; better perioperative stabilization; advancement in surgical and anesthetic techniques; highly skilled medical personnel and nursing care; effective pain management; better infection control; advance nutritional care and a sophisticated well-organized neonatal intensive care[3,5,11,13,14,15,16]. However, underdeveloped nations still experience dismal management outcome. This was attributed to the poor and lack of prenatal diagnosis; ineffective transport facilities; poor road network with long distances; late hospital presentation; limited primary health care facility; limited access to skilled medical personnel and care; lack of advanced anesthetic and surgical techniques; lack of parenteral nutrition; lack of effective antibiotics; lack of neonatal intensive care; poverty; disease ignorance; cultural beliefs and traditional methods of treatment[5,9]. The United Nations Sustainable Development Goal (SDG-3) through the Every Newborn Action Plan (ENAP) targets to end preventable neonatal deaths by the year 2030[8,10]. The aim of our study is to demonstrate the burden of neonatal surgical admissions in our facility and determine the neonatal and maternal factors that contribute significantly to neonatal mortality. Generally, this study will provide valuable information and guide for clinicians, hospital managers and policy makers during neonatal care, planning and design of hospitals respectively.

II. METHODOLOGY AND MATERIALS

This is a 6 years retrospective study of neonates diagnosed with surgical pathologies and admitted into the Special Baby Care Unit and the postnatal ward of the Jos University Teaching Hospital from January 2013 to December 2018. Data were extracted from case notes and discharge summaries. Those with incomplete data and those that were discharged against medical advice were excluded from the study. The patients were observed for age at presentation, gender, gestational age, weight, system involved by the pathology, diagnosed pathology, associated congenital malformations, maternal age, maternal parity, performed surgical procedures, management complications and outcome of management. Statistical analysis was performed using the Statistical Packaged for Social Science (IBM SPSS statistic version 24). Fischer exact test (with 95% confidence limits where appropriate) and student t-test were used for comparison of categorical and continuous variables respectively. Statistical significance was set at $p<0.05$.

III. RESULT

A total of 3,468 neonates were admitted to the neonatal wards within the study period and 299 (11.6%) were surgical neonates. Table 1 shows the demographic characteristics of the surgical neonates. There were 190 (63.5%) males and 109 (36.5%) females (M:F=1.74:1) with a mean age at presentation of 92.144 hours(S.D=127.4253) that ranges between 0.5 to 840 hours. Majority (55.2%) of the surgical neonates presented early (within 48 hours of birth). Gestational age assessment recorded preterm births (prematurity) in 8.4% of the neonates.

Table 1: Age at presentation, gender and gestational age distribution

	Parameter	Indices	Value
1	Age at presentation	<48 hrs	165(55.2%)
		≥48 hrs	134(44.8%)
2	Gender	Male	190(63.5%)
		Female	109(36.5%)
3	Gestational age	Preterm	25(8.4%)
		Term	274(91.6%)
		Post-term	0(0.0%)
4	Weight	<2.5Kg	25(8.4%)
		≥2,5Kg	274(91.6%)

Mean age at presentation=92.144(S.D=127.4253)hours, range=0.5-840 hours
Mean weight=2.941(S.D=0.3384)Kg, range=1.9-3.6Kg
Table 1: Neonatal demographic characteristics

Table 2 shows nature of the pathology, associated congenital malformations and complications during management. Congenital malformations accounted for majority (95.7%) of the neonatal surgical admissions. Associated congenital malformations and management complications were recorded in 8.4% and 24.4% of the neonates respectively.

Table 2: Neonatal clinical characteristics

	Parameter	Indices	Value
1	Clinical condition	Congenital	286(95.7%)
		Acquired	13(4.3%)
2	Associated other congenital associations	Yes	25(8.4%)
		No	274(91.6%)
3	Associated management complications	Yes	73(24.4%)
		No	226(75.6%)

Table 3 shows the maternal demographic characteristics. The mean maternal age was 27.75 years(S.D=5.954) that ranged between 15 to 48 years. Majority (87.3%) of the mothers were aged between 20-35 years. Teenagers and the elderly accounted for 3.7% and 9.0% respectively. The mean maternal parity was 2.95(S.D=1.921) that ranged between 1 to 14. Majority (56.2%) were within the 2-5 parity category. Primiparity and grand multiparity accounted for 26.5% and 17.4% respectively.

Table 3: Maternal demographic characteristics

	Parameter	Indices	Value
1	Age	<20 yrs	11(3.7%)
		20-35 yrs	261(87.3%)
		>35 yrs	27(9.0%)
2	Parity	Primiparity (1)	79(26.4%)
		Multiparity (2-5)	168(56.2%)
		Grand multiparity (≥5)	52(17.4%)

Mean maternal age=27.75(S.D=5.954)years, range=15-48 years
Mean maternal parity=2.95(S.D=1.921),Range=1-14

Figure 1 shows the distribution of the various involved body systems. Pathologies from gastrointestinal system accounted for the majority (55%) of the diagnosis. The central nervous system, the musculoskeletal system and the urogenital system account for 33%, 8% and 4% respectively.

Figure 1: Distribution of various body systems involved

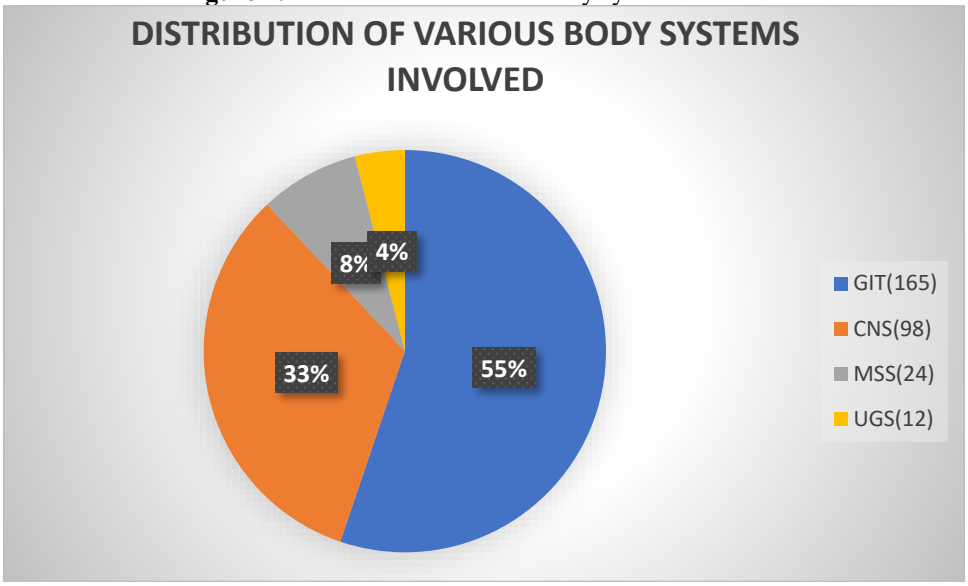

Figure 2 shows the distribution of the various pathologies in the neonates. Myelomeningoceles accounted for the majority (23.0%) and seconded (12.5%) by omphaloceles.

Figure 2: Distribution of surgical pathologies

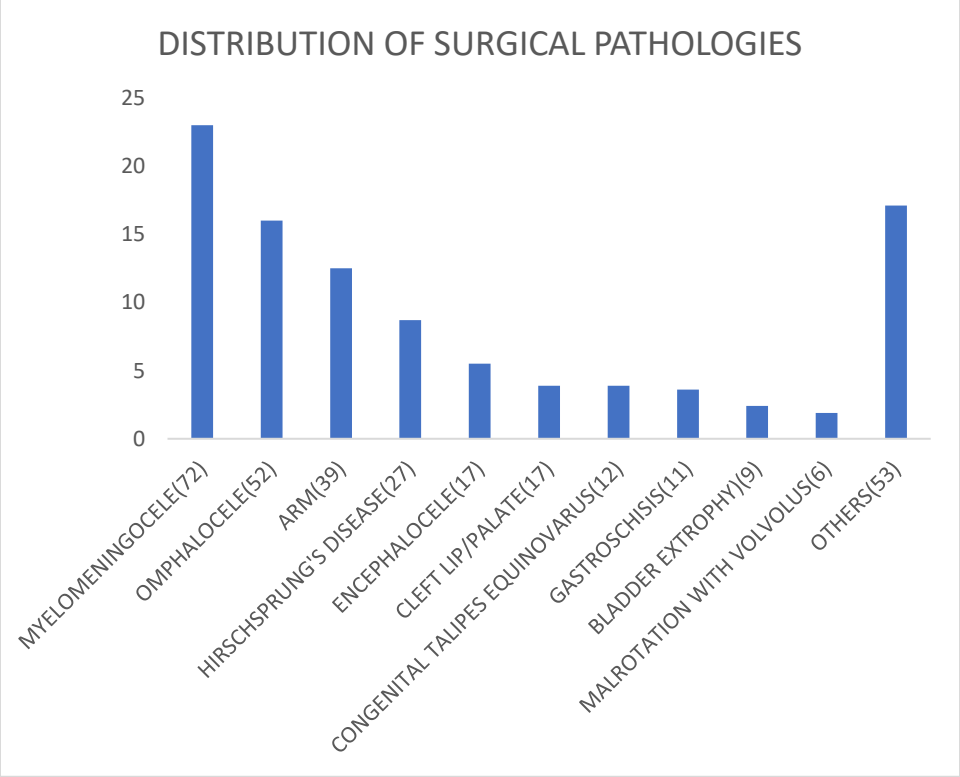

Table 4 shows the surgical interventions and outcome of management. Different surgical procedures were carried out in 46.2% of the neonates. Mortality was recorded in 20.7% of all the surgical neonates.

Table 4: Distribution of surgical interventions and outcome of management

	Parameter	Indices	Value
1	Surgical intervention	Yes	138(46.2%)
		No	161(53.8%)
2	Outcome of management	Alive	237(79.3%)
		Dead	62(20.7%)

Figure 3 shows the distribution of the various surgical procedures carried out during the admission period. Divided sigmoid colostomy is the major (20.1%) surgical procedure and seconded (18.8%) by excision and repair of myelomeningoceles.

Figure 3: Distribution of various surgical interventions

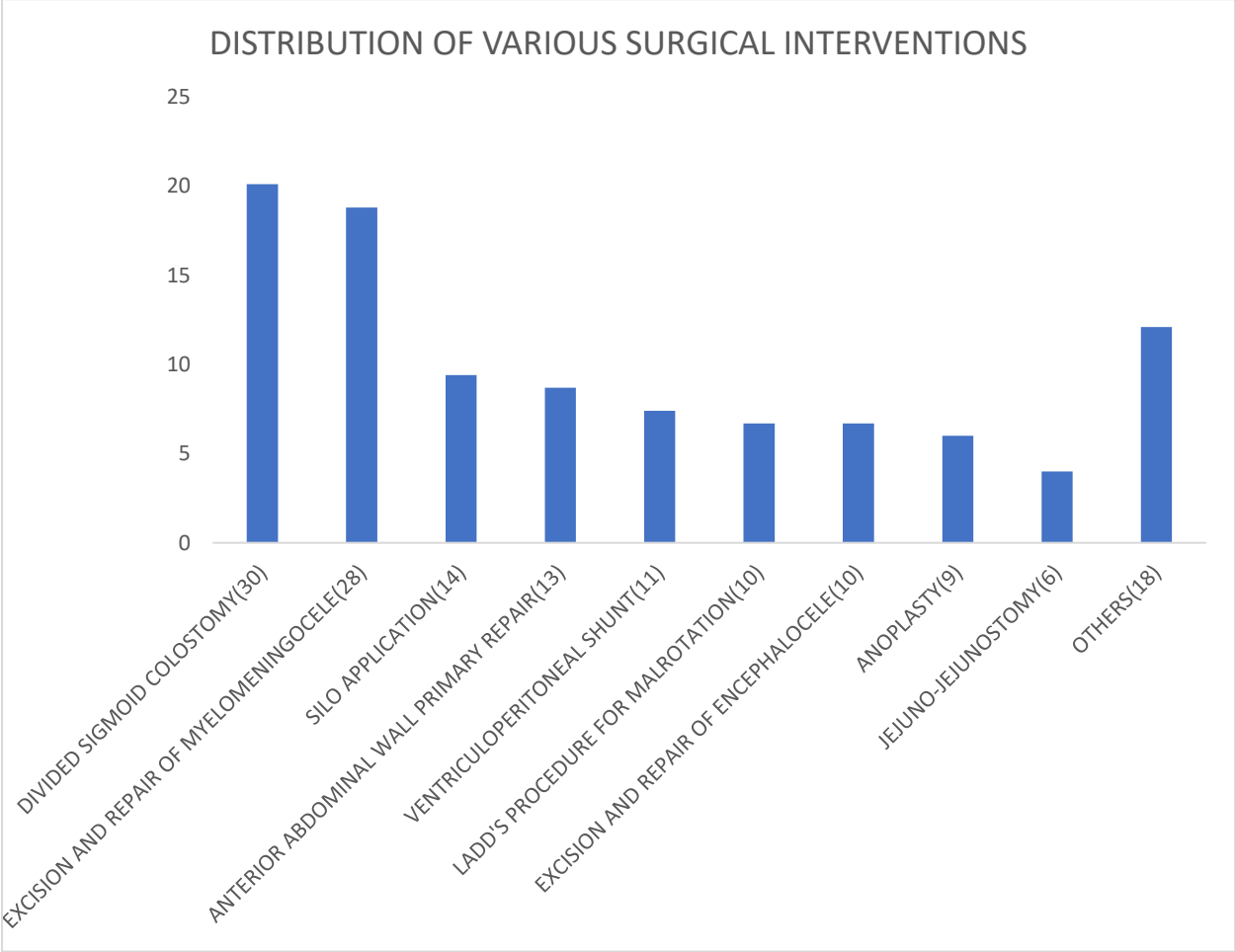

Figure 4 shows the various complications encountered during management. Sepsis accounted for majority (43.4%) of the management complications and seconded (22.6%) by hypothermia.

Figure 4: Distribution of various complications during management

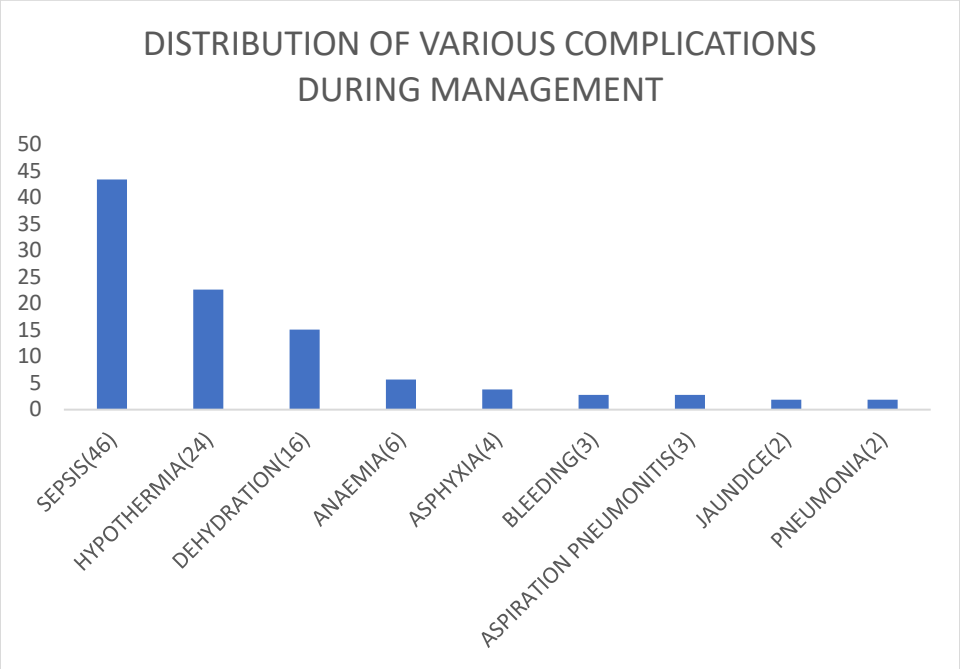

Table 5 shows the various neonatal and maternal predictors of management complications. The significant predictors of management complications were the **gestational age** [OR 0.259;95%CI(0112-0.597), **p=0.001**], **associated congenital malformations** [OR 2.687;95%CI(1.161-6.216), **p=0.017**], and **weight** [OR 0.259;95%CI(0.112-0.597), **p=0.001**].

Table 5: Predictors of management complications

		Associated complications					
			No	Yes	Odd Ratio	Confidence interval	p-value
1	Age at presentation	<48 hrs	129	36	1.367	0.805-2.320	0.246
		≥48 hrs	97	37			
2	Gender	Male	142	48	0.880	0.506-1.532	0.652
		Female	84	25			
3	**Associated congenital malformation**	No	212	62	2.687	1.161-6.216	**0.017**
		Yes	14	11			
4	**Weight**	<2.5Kg	12	13	0.259	0.112-0.597	**0.001**
		≥2.5Kg	214	60			
5	Advanced maternal age(>35 yrs)	No	205	67	0.874	0.339-2.257	0.781
		Yes	21	6			
6	Primiparity	No	167	54	1.004	0.550-1.832	0.984
		Yes	59	19			
7	Teenage pregnancy	No	216	72	3.333	0.419-26.492	0.228
		Yes	10	1			
8	**Gestational age**	Preterm	12	13	0.259	0.112-0.597	**0.001**
		Term	214	60			
9	Grand multiparity (≥5)	No	185	63	1.396	0.661-2.950	0.380
		Yes	41	10			

Table 6 shows neonatal and maternal predictors of surgical neonatal mortality. The significant predictors of surgical neonatal mortality were **gestational age** [OR 0.242;95%CI(0.104-0.561), **p= 0.000**], **associated congenital malformations** [OR 2.346;95%CI(0.983-5.598), **p=0.049**], **weight** [OR 0.242;95%CI(0.104-0.561) **p=0.000**], **prematurity** [OR 0.512;95%CI(0.282-0.931), **p=0.027**], **associated complications** [OR

38.768;95%CI(18.079-83.133), **p=0.000**], **associated sepsis** [OR 10.020;95%CI(5.007-20.049), **p=0.000**], and **hypothermia** [OR 27.738;95%CI(9.026-85.241), **p=0.000**].

Table 6: Predictors of mortality

			Management outcome				p-value
			Alive	Dead	Odd Ratio	Confidence Interval	
1	Age at presentation	<48 hrs	124	41	0.562	0.313-1.008	0.052
		≥48 hrs	113	21			
2	Gender	Male	150	40	0.948	0.529-1.700	0.858
		Female	87	22			
3	**Gestational age**	Preterm	13	12	0.242	0.104-0.561	**0.000**
		Term	224	50			
4	**Associated congenital malformation**	Yes	16	9	2.346	0.983-5.598	**0.049**
		No	221	53			
5	**Weight**	<2.5Kg	13	12	0.242	0.104-0.561	**0.000**
		≥2.5Kg	224	50			
6	Advanced maternal age(>35yrs)	Yes	20	7	1.381	0.556-3.431	0.486
		No	217	55			
7	Teenage pregnancy(<20 yrs)	Yes	8	3	0.687	0.177-2.670	0.586
		No	229	59			
8	**Primiparity**	Yes	55	23	0.512	0.282-0.931	**0.027**
		No	182	39			
9	Grand multiparity(>5)	Yes	45	6	2.188	0.887-5.393	0.083
		No	192	56			
10	**Associated complications**	Yes	23	50	38.768	18.079-83.133	**0.000**
		No	214	12			
11	**Associated sepsis**	No	219	34	10.020	5.007-20.049	**0.000**
		Yes	18	28			
12	**Associated hypothermia**	No	233	42	27.738	9.026-85.241	**0.000**
		Yes	4	20			

IV. DISCUSION

Neonatal surgical pathologies are a global disease burden. They contribute significantly to neonatal morbidity and mortality[1]. In our study, neonatal surgical admissions accounted for 11.6% of the total neonatal admissions. This falls within the range of 6.2% to 12.8% reported in previous studies by Opara et al in Port-Harcourt Nigeria, Samuel et al in Abia Nigeria and Ali Ada et al in Lamorde Niger republic[3,4,14]. However, as high as one-third of the total admissions have been reported by Maniraguha et al in Kigali, Rwanda[9]. Also, as low as 4.6% of the total neonatal admissions was reported by Virupakshappa et al in Bangalore, India[16]. A male dominance of M:F=1.74:1 was observed in our study. This is similar to previous studies by Ilori et al in Uyo Nigeria,Prasad et al Pradesh India,Shitaye et al in Addis Ababa Ethopia, Ali Ada et al in Lamorde Niger, Gangopadhyay in Varanasi India and Prasad et al in Pradesh India[13,14,15,16]. The high prevalence of congenital

malformations in males, the vulnerability of the male neonates during the neonatal period (biological survival of girls) and the cultural practices where there is preference to the care of male children who will serve as heirs to the family and keep the family name as speculated by Ike et al in Ibadan, Nigeria could account for the male dominance[7]. However, equal M:F ratio of 1.1:1 was demonstrated in a study by Abdul-mumin et al in Ghana[2]. The mean age of presentation observed from our study was 92.144hours. This is similar to studies by Maniraguha in Kigali, Rwanda[1]. However, this is in contrast to lower mean age of presentation of 47.5 hours reported by Ilori et al in Uyo, Nigeria[17]. Also, as high as 199.2 hours was reported by Prasad et al in Pradesh India and Kart in Isparta Turkey[11,13]. Majority (55.2%) of our neonates presented early within 48 hours and also 40.5% within 24 hours. This is more than the 26.9% presenting within 24 hours observed by Ike et al in Ibadan Nigeria[7]. Preterm neonates were observed in 8.4% of the neonates. This is similar to the 8.5% reported by Ali Ada et al in Lamorde Niger republic[14]. However, 31%,54.8%.64.2% and 64.7% were reported by Das et al in Madhya India, Ike et al in Ibadan Nigeria, Hassan et al in Dhaka Bangladesh and Chukwubuike et al in Enugu Nigeria respectively[6,7,8,18]. The mean weight of 2.9414Kg was observed from the study. This is similar to studies by Omid in Niger Republic and Prasad in India[13,19]. However, mean weight as low as 2.0Kg was reported in studies by Saggers et al in Johannesburg South Africa, Gangopadhyay et al in India, Das et al in Madhya India, and Virupakshappa et al in Bangalore India[5,9,18]. Our study observed low birth weight (<2.5Kg) in 8.4% of the neonates. Studies by Omid et al in Lamorde Niger Republic and Abdul-mumin et al in Ghana reported low birth weight in 28.3% and 34.1% of the surgical neonates respectively[2,19]. The few preterm and low birth weight observed in our study could be due to healthy lifestyle, adequate nutrition and effective antenatal care. We observed from our study that congenital malformations were the major (95.7%) neonatal surgical pathologies. This is similar to most studies by Shitaye et al in Addis Ababa Ethopia, Gangopadhay et al in Varanasi India, Ali Ada et al in Lamorde Niger Republic and Abdul-mumin et al in Ghana[2,5,14,15]. The gastrointestinal system was observed from our study to be the predominant (55.0%) system involved with the surgical pathologies seconded (33.0%) by the central nervous system. This is similar to studies by Abdul-mumin et al in Ghana, Gangopadhyay in Varanasi India, Shitaye in Addis Ababa Ethopia, Opara in Port-Harcourt Nigeria and Aiwanlehi in Benin city Nigeria[2,3,5,12,15,19]. Poor feeding, vomiting and abdominal distension are serious symptoms that need immediate medical attention. This could explain the dominance of the gastrointestinal pathologies recorded in the study. Neural tube defects result predominantly from maternal folic acid deficiency. Poor maternal folic acid reserves from recurrent pregnancy loss and low birth intervals, genetic factors and low consumption of folic acid has been observed. Associated congenital malformations were observed in 8.4% of our neonates. This is similar to studies by Samuel et al in Abia Nigeria[4]. However, this is in contrast to lower values of 1.5% and 4.3% reported by Opara et al in Port-Harcourt Nigeria and Gangopadhyay et al in India respectively[3,5]. Also, as high as 15.1% was reported by Ali Ada et al in Lamorde Niger Republic[14]. The mean maternal age of 27.75 years was observed from the study. This similar to studies by Saggers et al in Johannesburg South Africa[9]. Teenage pregnancy was observed in 3.7% of the mothers. Elderly mothers were observed in 9.0% of the mothers in the study. The study by Das et al in Madhya India reported that advanced maternal age was associated with poor management outcome[18]. The mean maternal parity of 2.95 was observed from the study and majority (56.2%) of the women were within the parity of 2-4. This similar to the study by Ali Ada in Lamorde Niger Republic[14]. Primiparity and grand multiparity were observed in 26.4% and 17.4% respectively in the study. Myelomeningocele was observed from the study to be the predominant (23.0%) surgical pathology seconded (12.5%) by omphalocele. This is contrary to different studies by Omid et al and Ali Ada et al both in Lamorde Niger Republic who demonstrated anorectal malformations and omphaloceles to account for majority of the neonatal surgical pathologies[14,19]. Surgical procedures were performed in 46.2% of the neonates in the study. This is similar to the study by Opara et al in Port-Harcourt Nigeria[3]. Lower surgical procedures were reported in the studies by Kart et al in Isparta Turkey and Gangopadhyay in Varanasi India[5,11]. As high as 67.7% of surgical procedures performed were reported in the study by Omid et al in Lamorde Niger Republic[19]. Divided sigmoid colostomy was the commonest (20.1%) surgical procedure performed in the study. This is similar to studies by Samuel et al in Abia, Nigeria, Ali Ada et al in Lamorde Niger Republic, Omid et al in Lamorde Niger Republic, Kart in Isparta Turkey and Chukwubuike et al in Enugu Nigeria[4,6,11,14,19]. However, this in in contrast to study by Gangopadhyay in Varanasi, India who demonstrated resection and anastomosis to be the commonest (27.7%) procedure[5]. Excision and repair of myelomeningocele was the second commonest (18.8%) procedure performed in the study. Management complications were observed in 24.4% of the neonates in the study. Sepsis was the predominant (43.4%) complication observed from the study. This is similar to studies by Prasad et al in Pradesh India, Gangopadhyay et al in Varanasi India and Samuel et al in Abia Nigeria[4,5,13]. Hypothermia was observed to be the second (22.6%) commonest complication. Correlation of the predictive risk factors of management complications were assessed. **Prematurity** [OR 0.259;95%CI(0.506-1.532), **p=0.001**], **associated congenital malformations** [OR 2.687;95%CI(1.161-6.216), **p=0.017**] and **low birth weight** [OR 0.259;95%CI(0.112-0.597), **p=0.001**] were statistically significant as predictors of management complications. The mortality rate of 20.7% was demonstrated from the study. This is similar to reported findings in the studies by Gangopadhyay et al in Varanasi India,Omid et al in Lamorde Niger Republic,Das in Madhya India and Opara et al in Port Harcourt Nigeria[3,5,18,19]. However, lower mortality rates have been reported by Samuel

et al in Abia Nigeria,Abdul-mumin in Ghana andKart in Isparta Turkey[2,4,11]. Also, higher mortality rates were reported in the studies by Ali Ada et al in Lamorde Niger Republic,Prasad et al in Pradesh India ,Maniraguha et al in Kigali Rwanda, and Ilori et al in Uyo Nigeria[1,13,14,17]. The causes of death observed from our study were multifactorial. This is similar to studies by most authors reported by Prasad et al in Pradesh, India[13]. The correlation of the predictive risk factors of mortality were assessed. **Prematurity** [OR 0.242;95%CI(0.104-0.561), **p=0.000**], **associated congenital malformations** [OR 2.346;95%CI(0.983-5.598), **p=0.049**], **low birth weight**[OR 0.242;95%CI(0.104-0.561), **p=0.000**], Primiparity [OR 0.512;95%CI(0.282-0.931), **p=0.027**], **management complications** [OR 38.768;95%CI18.079-83.133), **p=0.000**], **sepsis**[OR 10.020;95%CI(5.007-20.049), **p=0.000**] and **hypothermia** [OR 27.738;95%CI(9.026-85.241), **p=0.000**] were statistically significant predictors of mortality. The study by Ike et al in Ibadan Nigeria showed that the more the parity the better the care[7]. This is because those with less parity especially the primiparous women have challenges in the nursing care of the admitted neonates. This predisposes the neonates to undernutrition and the resultant complications. Sepsis was observed from our study to be the major cause of mortality. This similar to studies by Gangopadhyay in Varanasi India, Ali Ada et al in Lamorde Niger Republic, Hassan et al in Dhaka Bangladesh, Mallick et al in Riyadh Saudi Arabia and Kart et al in Isparta Turkey[5,8,11,14,20]. However, the study by Abdul-mumin et al in Ghana showed low birth weight to be most significant predictor of mortality[2]. Also studies by Das et al in Madhya India, Opara et al in Port-Harcourt Nigeria, Gagopadhyay et al in Varanasi India and Saggers et al in Johannesburg South Africa demonstrated prematurity to be the most significant contributor to neonatal mortality[3,5,9,18].

V. LIMITATION

The main limitation of this study, apart from it being a retrospective study, is the small sample number of patients involved and limited adequate facilities for optimal neonatal care. A larger volume prospective study will give a comprehensive insight into the burden of this neonates in our region.

VI. CONCLUSION

Our study showed that neonatal surgical admissions accounted for 11.6% of the total neonatal admissions. Congenital malformations were the major pathologies recorded. Myelomeningoceles were the predominant pathology observed but divided sigmoid colostomies were the commonest surgical procedure performed. Sepsis was the predominant complication observed. Prematurity, associated congenital malformations and low birth weight were the significant predictive risk factors for development of management complications. The predictive risk factors of mortality were multifactorial. Prematurity, associated congenital malformations, low birth weight, primiparity, associated complications, associated sepsis and associated hypothermia were the significant predictive risk factors of mortality.

LIMITATION

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