

ORIGINAL ARTICLE

PROFILE OF CONGENITAL SURGICAL ANOMALIES IN NEONATES ADMITTED TO TERTIARY CARE NEONATAL INTENSIVE CARE UNIT OF SAURASHTRA REGION

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ABSTRACT

Background: Congenital surgical anomaly is a major indication for admission of a neonate to an intensive care unit. Profile of surgical conditions is variable by system affecting the neonate and outcomes of the individual conditions depending upon treatment and post surgical facilities. This study was undertaken to highlight the surgical conditions, their burden and their prognosis encountered in our newborn care unit.

Methodology: This study is a cross sectional study. All information was collected from the case records of all neonates admitted in newborn care unit of our centre between 1st April, 2011 and 31st October, 2014 with congenital surgical conditions and the following information extracted: surgical condition, age, sex, maturity, birth weight, its treatment and outcome, and other associated features were studied.

Result: A total of 9213 neonates were admitted in the study period, of which 328 neonates (3.6%) had surgical conditions. Surgery was performed in 225 neonates. Commonest congenital surgical condition was of gastrointestinal tract (GIT). Commonest GIT anomalies were tracheo-oesophageal fistula (28.6%), intestinal obstruction (23.7%), anorectal malformation (17.9%), and omphalocele (7%). The overall mortality in neonates with congenital surgical condition in this study was 51.2%. Significantly, more deaths occurred in preterm than in term neonates ($P = 0.00003$) and low birth weight babies more than normal weight ($p=0.0002$).

Conclusion: High mortality is found in neonates suffering from surgical conditions. Commonest anomaly includes conditions of Gastrointestinal tract. Prematurity and low birth weight is a significant factor associated with high mortality.

Keywords: Neonate, surgical anomalies, congenital

INTRODUCTION

Neonatal surgical conditions are important causes for neonatal mortality and morbidities. Outcome and burden is variable from disease to disease and facility to facility. Surgical neonates are a subclass of patients having wide differences in physiology, anatomy, diseases, immunity and response to the stress, as compared to older patients.

Though paediatric and neonatal surgery has made great strides globally in many centres, including ours, the surgical emergencies are first diagnosed by the neonatologists and paediatricians. Not only the neonatologists make the preliminary diagnoses but also help in stabilizing these neonates for a successful surgical intervention. In a developing country like ours, resource crunch in regard to manpower, money and machines dictates avoiding duplication of services within the same hospital. No wonder the neonatologists have often even offered to manage the

patients post operatively. There is a better outcome in surgical neonates when they are in safe hands of expert paediatric surgeon and neonatal intensivist.

In developed countries, outcome of neonatal surgical cases is favourable because of availability of antenatal diagnosis, improved surgical skills and technologies, sophisticated neonatal intensive care unit, availability of total parenteral nutrition and adequate staff. In developing countries, however, neonatal surgery is still fraught with a lot of problems including late presentation and lack of medical facilities and human resources, thereby, making newborn surgery to be associated with unacceptably high morbidity and mortality.

The aim of this study was to provide information on clinical profile of congenital surgical problems and to highlight their burden and prognosis in our newborn intensive care unit in Saurashtra region.

METHODOLOGY

This is a cross sectional study, in which a retrospective analysis of all case records of neonates with a surgical problem admitted to level III NICU of a tertiary health care referral centre between 1st April, 2011 and 31st October, 2014 was studied. Institutional ethical committee clearance was obtained before starting the study. Patients with any acquired form of surgical conditions (like abscess, NEC) were excluded from the study.

Surgical cases are handled by paediatric surgeons and paediatrician. Case notes and admission records in newborn unit were used to extract the following information: Sex, age at presentation, date of admission, maturity, surgical condition, treatment and prognosis (outcome of the management). Data was entered in an Excel spread sheet and analysed using Epi Info version 3.5.1. Categorical data were analysed using the Chi-square test and a *P*-value ≤ 0.05 was regarded as significant.

RESULTS

A total of 9213 neonates were admitted within the study. 328 (3.6%) had surgical condition. General characteristics of these neonates are shown in Table 1.

Table 1: General characteristics of the neonates with surgical conditions

Variables	Admitted No. (%)
Total admission	9213
Neonates with surgical conditions	328(3.6)
Male	196(59.8)
Female	132(40.2)
Death	168(51.2)
Intramural	53(16.2)
Extramural	275 (83.8)
Low birthweight	185(56.4)
Normal birth weight	143(43.6)
Preterm	130 (65.6)
Term	198 (60.4)

Out of these 196 (59.8%) were males and 132 (40.2%) were females. Average age on admission was 5days (Range 1 day to 30 days). The average birth weight was 2.4 kg (Range 1.1kg to 4.0kg). Out of 185 neonates with low birth weight with surgical conditions 111(60.1%) died which was statistically significant (*P* =0.00003). Out of 130 premature neonates 85(65.3%) died which was statistically significant (*P* = 0.0002).

Following table-2 shows neonates which presented with the following surgical conditions and their outcome.

TABLE 2: Neonates with surgical conditions and outcome

System Involved	Surgical Condition	Admission (N=328)	Survival (%)	Expired (%)	Dama (%)	Refer (%)
Lower GI System	Intestinal Obstruction	78	35(44.8)	31(39.7)	9(11.5)	3(3.84)
	Imperforate Anus	63	32(50.7)	22(34.9)	8(12.7)	1(1.6)
	Inguinal Hernia	2	1(50)	-	1(50)	-
	Intestinal Malformation	1	-	1(100)	-	-
	Microcolon	1	1(100)	-	-	-
	Total	145	69(47.6)	54(37.2)	18(12.4)	4(2.8)
Upper GI System	Tracheosophageal Fistula	94	9(9.6)	67(71.2)	12(12.7)	6(6.3)
	Atresia Of Upper Gi Tract	14	2(14.2)	10(71.4)	2(14.2)	-
	Diaphragmatic Hernia	17	1(5.9)	15(88.2)	-	1(5.9)
	Pyloric Stenosis	3	-	-	3(100)	-
	Total	128	12(9.3)	92(71.8)	17(13.2)	7(5.4)
Anterior Abdominal Wall Defect	Omphalocele	23	2(8.7)	12(52.1)	7(30.4)	2(8.7)
	Gastrochiasis	6	-	4(66.6)	2(33.3)	-
	Umbilical Hernia	5	2(40)	2(40)	1(20)	-
	Extrophy Of Bladder	1	1(100)	-	-	-
	Total	35	5(14.2)	18(51.4)	10(28.5)	2(5.7)
CNS System	Hydrocephalus	7	-	3(42.8)	2(28.6)	2(28.6)
	Spina Bifida	5	-	-	1(20)	4(80)
	Meningomyelocele	3	-	-	1(33.3)	2(66.6)
	Total	15	-	3(20)	4(26.6)	8(53.3)
Genito Urinary System	Hypospadias	3	-	-	3(100)	-
	Posterier Urethral Valve	1	-	-	-	1(100)
	Scrotal Teratoma	1	-	1(100)	-	-
	Total	5	-	1(20)	3(60)	1(20)

(DAMA discharged against medical advice)

The most common system involved in neonates presenting with congenital surgical conditions was gastrointestinal tract (GIT). Commonest GIT anomalies were tracheo-oesophageal fistula (28.6%), intestinal obstruction (23.7%), anorectal malformation (17.9%), and omphalocele (7%). The commonest surgical interventions were laparotomy, intestinal resection and anastomosis, colostomy and closure of abdominal wall defect.

Table 3 shows management and outcome of all neonates admitted with surgical condition.

Table 3:. Management and outcome of neonatal surgical cases

Intervention	No (%)	Male (%)	Female (%)	Discharge (%)	Died (%)	Dama (%)	Refer (%)
Surgery performed	225 (68.5)	127 (56.4)	98(43.6)	86(38.2)	131(58.2)	7(3.1)	1(3.1)
No surgery	103(31.4)	69(67.0)	34(33.0)	0	37(35.9)	45(43.7)	21(20.4)
Total	328	196	132	86	168	52	22

DISCUSSION AND CONCLUSION

In our study 3.6% of the NICU admissions were due to neonatal surgical conditions. It was higher than 3.0% reported in a study by Shija JK in Tanzania.¹, however, the study was over 3and1/2 year period as against the present study that was over an 8-year period In a study by Ugwu RO in Nigeria, this incidence was 6.2%.²

The most common surgical conditions in the newborn involve the gastrointestinal tract.³In our study GIT anomalies were (56.9%), whereas in the study by Ugwu RO in Nigeria (43.7%).²

The mortality in neonates with surgical condition in this study was 51.2%. Other authors had earlier reported lower mortalities ranging from 30.5% to 42.3%.^{4,5,6,7} A higher mortality of 53.6% is reported in another study.⁸

Significantly, more deaths occurred in preterm babies and low birth babies. Mortality generally is known to be higher in preterm babies because of the immaturity of all physiologic functions and other multiple confounding factors.

Major limitation of our study was that it was a retrospective case based study, and not all the detailed information pertaining to cases could be extracted from the records.

Lower GI anomalies are common making a major part of congenital surgical anomalies in neonates, followed by upper GI anomalies. Survival of neonates

The table-2 above shows better outcome with patients with lower GIT involvement in patients having anorectal malformation followed by intestinal obstruction. Poor outcome and expiry seen in neonates with intestinal malformation, diaphragmatic hernia, tracheo-oesophageal fistula, GI atresia, gastrochiasis. It was observed that major surgeries involving laparotomy and lengthy and complex procedures had poor outcome.

having surgical anomalies varies according to profile of anomalies with better outcomes in the patients of lower GI tract anomalies. Prematurity and low birth weight are important risk factors for poor outcomes in neonates with surgical anomalies.

REFERENCES:

1. Shija JK. Neonatal surgical problems in Dar-es-Salaam, Tanzania. *Med J Zambia* 1977;11:139-43
2. Ugwu RO, Eneh AU. Mortality in the special care baby unit of University of Port Harcourt Teaching Hospital, Port Harcourt, Nigeria: Why and when do newborns die? *Niger J Paediatr* 2008;35:75-81.
3. White RD. Surgical emergencies In: Roberts KB, editor. *Manual of clinical problems in Paediatrics*. 5th ed. Lippincott Williams and Wilkins Publishers; 2000. p. 275-81.
4. Osifo OD, Ovuani ME. The prevalence, patterns, and causes of deaths of surgical neonates at two African referral pediatric surgical centers. *Ann Pediatr Surg* 2009;5:194-9.
5. Ameh EA, Dogo PM, Nmadu PI. Emergency neonatal surgery in a developing country. *Pediatr Surg Int* 2001;17:448-51
6. Momoh JT. Exomphalos: Management problems in the tropics. *Ann Trop Paediatr* 1982;2:73-8
7. Adeyemi D. Neonatal intestinal obstruction in a developing tropical country: Patterns, problems, and prognosis. *J Trop Pediatr* 1989;35:66-70
8. Sowande OA, Ogundoyin OO, Adejuyigbe O. Pattern and factors affecting management outcome of neonatal emergency surgery in Ile-Ife, Nigeria. *Surg Pract* 2007;11:71