

PATTERN OF SURGICAL DISEASE IN NEONATES : STUDY FROM A TERTIARY CARE CENTER



Surgery

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ABSTRACT

INTRODUCTION - Neonatal diseases requiring surgical intervention do account for a significant number. The leading causes are congenital anomalies, surgical infections, and trauma. Congenital malformations are structural defects of prenatal origin that result from defective embryogenesis, develop in approximately 3% of newborns and have been estimated to lead to 15% of perinatal mortality in India. The incidence of surgical emergency in neonate range from 1 to 4 per 100 births.

AIM- This study aimed to determine the disease patterns of neonates requiring surgical intervention admitted to the Department of Paediatric Surgery, NRS Medical College and Hospital, Kolkata from 2017 to 2020.

METHODS:- Retrospective analysis of data of all neonates admitted after being referred from various primary and secondary health care centers, during the study period were reviewed and analysed for age at presentation, sex, religion, clinical features, birth weight, and diagnosis encountered during the hospitalization. These neonatal problems were classified as congenital and acquired surgical diseases.

RESULTS- Patients requiring surgical intervention were 2370 during this term at the institute. Patients presenting after first day of life constituted 69.03%. The population constituted 68.06% male patients 30.89% females and 1.06% belonged to undetermined gender who later underwent karyotyping. Patients that were below 2.5 kg at the time of presentation consisted of 50.67% of the population. Congenital abnormalities accounted for over 80% of all neonatal surgical conditions. Acquired diseases were found in 10.25% in our study population. The most common surgical conditions in the newborn involve the gastrointestinal tract 62.52%.

CONCLUSION- This small group of patients in the neonatal age group is in need of more attention due to the growing surgical problems in them. This study is a notification for the need for increased care in our health sector for these patients in the neonatal age group. From the rarest of the rare like parasitic twin to the hundreds of gastrointestinal anomalies like the anorectal malformations that require surgical attention, the neonates have it all.

KEYWORDS

Neonates, Congenital Anomalies, Surgical Conditions, Anorectal Malformation

INTRODUCTION

The field of Paediatric Surgery was formed as a separate branch within the realms of General Surgery due to the unique features of diseases that affect the neonates and because of the fact that physiological responses of body are different both in qualitative and quantitative aspect from the adult.[1]

Neonatal diseases requiring surgical intervention do account for a significant percentage. The most common causes considered till date are congenital anomalies, surgical infections and trauma.[2] Congenital malformations are defined as structural defects of prenatal origin that result from defective embryogenesis. It occurs in approximately 3% of newborns and have been estimated to cause upto 15% of perinatal mortality in India [3]. The incidence of surgical emergency in neonate ranges from 1 to 4 per 100 births.[4] Very less information is available about the burden of neonatal surgical conditions on the overall neonatal mortality. Many diseases of the neonates that can be treated by surgery. If not recognized and treated may lead to the death of the infant within a few days after birth.

The number of births affected by congenital anomalies in India is not known due to lack of national birth defects surveillance. The need for this data arises as currently there is very less data on the impact of congenital anomaly affecting pregnancies or births on health service utilization, for either termination of pregnancy due to detection of a fetal anomaly or for neonatal intensive care services or to derive estimates of the number of children born with disabling conditions.

Medical and rehabilitative services for affected neonates through government health services are limited in India in the present situation. This results in significant increased expenditure for families specially for those that belong to low socioeconomic level [5,6]. Data on the magnitude of congenital anomalies are also needed as some of these conditions can be prevented

through primary care interventions targeted towards women in the preconception and antenatal periods [7]. Strategies that target the prevention of births affected by congenital anomalies also target the shared risk factors for other adverse pregnancy outcomes which effectively aims at reduction of congenital anomalies, and improving pregnancy outcome [8].

It is necessary to understand the burden of these diseases and their trend by regular analysis of data available in the Neonatal surgical unit. This will also help us to know the relative incidence of these neonatal surgical illnesses which is currently unavailable for our developing nation.

METHODS

Analysis was done to determine the disease patterns of patients admitted to the Department of Paediatric Surgery, NRS Medical College and Hospital, Kolkata from February 2017 to February 2020. 2370 patients were studied during this period.

Data collected includes age at presentation, sex, religion, clinical features, body weight, and diagnosis encountered during the hospitalization. These neonatal problems were classified as congenital and acquired surgical diseases. Confirmed diagnosis as documented in the case record was obtained.

INCLUSION CRITERIA - Neonatal age was confirmed that is less than 28 days.

EXCLUSION CRITERIA- Neonates who were admitted but died before surgery or who required surgery at neonatal stage but left before surgery.

RESULTS

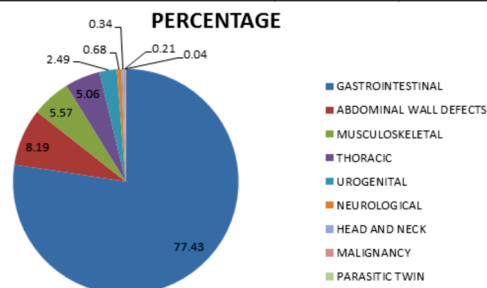
Total number of neonates with surgical diseases operated under the Department of Paediatric Surgery, NRS Medical College and Hospital, Kolkata from 2017 to 2020 were 2370.

Table 1: Demographic Profile Of Patients

FEATURES	NO OF PATIENTS	PERCENTAGE
1. AGE AT PRESENTATION		
1 DAY	568	23.97
>1 DAY - <20 DAYS	1636	69.03
>20 DAYS – 28 DAYS	166	7.00
2. GENDER		
MALE	1613	68.06
FEMALE	732	30.89
OTHERS	25	1.05
3.RELIGION		
HINDU	1382	58.31
MUSLIM	987	41.65
OTHERS	1	00.04
4.BODY WEIGHT		
<1KG	9	00.38
1-2 KG	602	25.40
2-2.5KG	590	24.89
>2.5 KG	1169	49.32
5.ETIOLOGY		
CONGENITAL	243	10.25
ACQUIRED	2127	89.75

Table 2 : Cases According To System Involved

	SYSTEM INVOLVED	NO. OF PATIENTS	PERCENTAGE
1	GASTROINTESTINAL	1835	77.43
2	THORACIC	120	5.06
3	ABDOMINAL WALL DEFECTS	194	8.19
4	SKIN AND CONNECTIVE TISSUE	132	5.57
5	UROGENITAL	59	2.49
6	NEUROLOGICAL	16	0.68
7	HEAD AND NECK	8	0.34
8	MALIGNANCY	5	0.21
9	PARASITIC TWIN	1	0.04

**Figure 1: Cases According To System Involved****Table 3: Types Of Anomalies**

S.NO	DISEASE	NO. OF PATIENTS
A.	GASTROINTESTINAL	
1	ANORECTAL MALFORMATION	680
2	TRACHEOESOPHAGEAL FISTULA	211
3	HIRSCHSPRUNG'S DISEASE	200
4	INTESTINAL PERFORATION	118
5	MALROTATION	109
6	ILEAL ATRESIA	102
7	DUODENAL ATRESIA	89
8	JEJUNAL ATRESIA	77
9	JEJUNOILEAL ATRESIA	57
10	MECONIUM ILEUS	57
11	IHPS	39
12	CLOACAL EXSTROPHY	26
13	MECONIUM CYSTIC PERITONITIS	15
14	OBSTRUCTED INGUINAL HERNIA	9
15	COLONIC ATRESIA	9
16	ANNULAR PANCREAS	9
17	MISCELLANEOUS	28
B.	ABDOMINAL WALL DEFECTS	

1	GASTROSCHISIS	119
2	OMPHALOCELE	24
3	UMBILICAL CORD HERNIA	51
C	MUSCULOSKELETAL	
1	ABSCESS	118
2	CELLULITIS	6
3	NECROTISING FASCITIS	4
4	CONG. AMNIOTIC BANDS	2
5	POLYDACTYLY	1
6	GANGRENE FINGER	1
D	THORACIC	
1	CONGENITAL DIAPHRAGMMATIC HERNIA	107
2	EVENTRATION	9
3	PLEURAL EFFUSION	4
E	UROGENITAL	
1	POSTERIOR URETHRAL VALVE	48
2	TORSION TESTIS	4
3	HYDROMETROCOLPOS	3
4	OVARIAN CYST	3
5	URETHRAL ATRESIA	1
F	NEUROLOGICAL	
1	MENINGOMYELOCELE	16
G	HEAD AND NECK	
1	CYSTIC HYGROMA	3
2	ORAL MASS	5

DISCUSSION

We have studied neonates who required surgical management over the span of 3 years. 2370 patients underwent surgical intervention during this term. On an average in one year 790 neonatal surgeries were undertaken in our department. Kim in 1990 reported 74 neonatal surgical emergency per year.[9] Alder Hey hospital Liver pool reported 663 neonatal surgeries in six years which is 110 per year [10]. Yadav showed 76 neonatal surgical emergencies per year.[2]

Most of the children that is 69.03% presented after first day of life in our study. In study by Yadav et al at Jabalpur maximum patients that is 69.4% neonates were brought to hospital within first seven days of life. 48.4% cases were hospitalized within 72 hours of life so all studies carried out at Jabalpur revealed that three fourth patients of anorectal malformation attended hospital within 72 hours of life.[2] In study by Ugwu RO in Nigeria the range of age on admission was 30 minutes to 27 days.[11]

68.06% patients were males 30.89% females and 1.06% belonged to undetermined gender who later underwent karyotyping. In study by Virupakshappa PM et al at Bangalore male to female ratio was 1.7:1.[12] Overall male female ratio observed in study by P. Yadav et al was 1.4:1 male female ratio in various groups. Out of the total 1374 patients in study by Arushi et al 60.5% were males while only 39.5% of them were females [13] Male predominance is clearly seen in patients with neonatal surgical causes. We included religion in our study as certain religion have predominance of congenital diseases due to consanguineous marriages. 58.31% patients were Hindus and 41.65% patients were Muslims.

50.67% of patients were below 2.5kg body weight at the time of presentation. Range of body weight in our study group was 650 gm-4100gm. In study by Virupakshappa PM et al mean birth weight of the babies was 2200gm and range was 1000 to 4000gm requiring surgical intervention. In study by Ugwu RO the mean weight was in the range of 900 gm to 5600 g.

Congenital abnormalities accounted for over 80% of all neonatal surgical conditions. 89.75% congenital disease was found to require surgery in our study. This was similar to the findings in other studies [14]. 10.25% acquired diseases also constitute our study.

The most common surgical conditions in the newborn involve the gastrointestinal tract.[15] In our study similar results were seen with 62.52% patients presenting with gastrointestinal anomalies. Anorectal malformation was the most common

congenital disease encountered in the study. Similar results were found in study by Seth et al.[4] Such results were also found in a study in Nigeria by Ugwu RO et al. Tracheoesophageal fistula presented with second highest condition of gastrointestinal malformations (11.5%) in our study. Virupakshappa PM et al found this disease to be present in 8.2% of their study population. Seth et al found 8% of them in their study group.

Hirschsprung's disease follows next in the list after anorectal malformation. Intestinal perforation was also a common presentation for gastrointestinal surgical conditions. Causes included necrotising enterocolitis, midgut volvulus, Meckels' diverticulum perforation. Small bowel atresia also formed a significant part of gastrointestinal anomaly.

Some conditions like thermal burn over the abdomen of a neonate due to electric warmer leading to multiple perforation of the bowel also lead to emergency surgery at our Department. Perineal tear during delivery was found in two patients. In an acute abdominal condition leading to exploratory laparotomy revealed hemoperitoneum with liver laceration. Abdominal masses, Meckels' band obstruction, pyloric atresia and patent vitellointestinal duct were operated upon.

Abdominal wall defects (8.2%) followed the list after gastrointestinal anomalies which consisted of gastroschisis, omphalocele and umbilical cord hernia. Lukman O Abdur-Rahman et al. showed in their study that omphalocele and gastroschisis together constituted 2.4% of the total neonatal surgical diseases operated in Nigeria.[16] Rosemary O Ugwu had 14.2% patients of anterior abdominal wall defect in neonates.

Thoracic malformations included Congenital diaphragmatic hernia and Eventration of diaphragm. Chest radiographs were diagnostic in most of the thoracic anomalies. Congenital diaphragmatic hernia was the most common thoracic anomaly. Congenital diaphragmatic hernia and eventration consists of 4.9% of the total conditions that required surgical management in neonates. Virupakshappa PM et al found the percentage of Congenital diaphragmatic hernia and eventration to be 8.9%. Respiratory emergency observed in 13.7% cases by P.Yadav et al.

Skin disorders consists of 5.57% of the total diseases that required surgical intervention at neonatal stage. Most of them were acquired in neonatal period. Diseases included abscess, cellulitis and necrotising fasciitis. Streptococcus and Staphylococcus species are the most common causes of skin and soft tissue infections in the pediatric age group. It is generally caused by local invasion after defect or injury to the skin. It can even be caused by hematogenous spread in neonates and the immunosuppressed.[17]

Congenital diseases in this section included congenital bands and polydactyly.

Urogenital anomalies consists of posterior urethral valve as the most common anomaly. Other congenital anomalies include hydrometrocolpos, urethral atresia and large ovarian cysts. Acquired disease included testicular torsion. Renal disorders consists of 3.1% of total surgical disorders in study by Virupakshappa PM et al

Neurological disorders included meningocele. Virupakshappa PM et al found 6.1% patients with neurological disorders. In study by P. Yadav et al found these anomalies to be 9.4%.

Head and neck anomalies included cystic hygromas, oral masses of multiple types arising from gum, hard palate or lip. Malignancy included sacrococcygeal teratoma. One case of parasitic twin was dealt with in the neonatal period.

CONCLUSION

We have tried to study the burden of surgical cases in the neonatal age group in a referral center of West Bengal. This tells us about the wide range of cases that the neonatal group patients do turn up with. This small group of patients is in need of more attention due to the growing surgical problems in them. This study is a notification for the need for increased care in our health sector. From the rarest of the rare to the hundreds of gastrointestinal anomalies that require surgical attention, the neonates have it all. There might be many newer aspects that have

still to be discovered in the surgical diseases of the neonates.

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