



EPIDEMIOLOGY OF PEDIATRIC SURGICAL CONDITIONS OBSERVED IN A RURAL TERTIARY CARE HOSPITAL

Paediatrics

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ABSTRACT

Background: Little is known about the surgical conditions affecting the Pediatric population in developing countries. Data on the spectrum of surgical diseases and the burden of Pediatric surgical diseases on health systems are lacking. In this article we describe the epidemiology of Pediatric surgical diseases observed in our rural tertiary care hospital. **Methods:** We retrospectively reviewed the records of all children (0–14 years) admitted to the Pediatric ICU from January 2020 to October 2022. We also reviewed the records of all the patients admitted to the Neonatal ICU and among them we selected the ones in which a surgical diagnosis was present. Four hundred fifty three children were admitted to Pediatric ICU and four hundred and sixty six babies were admitted to neonatal ICU during the study period. **Results:** 453 children were admitted to pediatric ICU of which 183 were surgical cases and 466 babies were admitted to NICU of which 2 were surgical cases. Males were 122 (66%) and females were 63 (34%). Largest number 114 (62%) of patients were in the age group 0-5 years followed by 6-10 years age group 53 (28%). The highest number of admissions were for the OMFS; cleft lip 44(24%), cleft palate 25(14%), followed by genitourinary system which included hydrocele 11(6%) and inguinal hernia 11(6%), undescended testis 6(3%), hypospadias 5(2.7%) followed by Neurosurgery cases which included hydrocephalus 11(6%), and subdural hematoma 2(1%). GI conditions were acute appendicitis with appendicular perforation 10(5.4%), cholelithiasis 3(1.6%) and small bowel obstruction 2(1%) **Conclusion:** Surgical conditions are important part of pediatric and neonatal care. Management of congenital surgical condition is important to decrease infant and under five mortality and other comorbidities as well. In developing countries, surgical care for children should be considered an important part of child health programs.

KEYWORDS

Pediatric surgery, Neonatal surgery OMFS- Oral and maxillofacial surgery

INTRODUCTION

India with over 1.4 billion population has 400 million children now under 14 years of age. Over 23 million babies are born in India each year and over 6 million die soon after birth. Almost 40% babies are premature and less than 2.5 kg in weight. About 2% babies are born with congenital malformations, of these 0.01% are serious and require urgent surgical intervention if they are to survive. About 1.72 million babies would die each year under 1-year of age in India alone. This presents a huge clinical workload of various surgical disorders to be treated in childhood.¹

According to recent estimates, 5 billion people, mostly in low- and middle-income (LMIC) countries, lack access to safe and affordable surgery², and surgical diseases can account for up to 32% of the global disease burden.³

Children's surgical needs are fundamentally different from adults.^{4,5} The majority of surgical cases which disproportionately affect children include congenital anomalies and injuries. The infrastructure, workforce, and resources needed for Pediatric surgical treatment are distinct from those needed for adults.⁶

Surgical care is not considered an essential component of most child health programs. Strategies for enhancing Pediatric surgical care should be evidence-based, affordable, and focus on helping as many children as possible. The best way of achieving policy change is to show that Pediatric surgical conditions are a serious public health problem.

MATERIALS AND METHODS

Study Design:

We retrospectively reviewed the records of all children (0–14 years) admitted to the pediatric ICU and Neonatal ICU in Dr. Pinnamaneni Siddhartha institute of medical sciences & RF hospital

Study Duration: January 2020 to October 2022

Inclusion criteria:

All patients admitted to NICU and PICU with surgical conditions were included in the study

Exclusion criteria:

Patients who took discharge against medical advice were excluded from the study

1) Data collection

We retrospectively reviewed the records of all children (0–14 years) admitted to the pediatric ICU from January 2020 to October 2022. For each admission we recorded medical record number, patient's name, dates of admission and discharge, sex, age group, area of residence, principal and secondary diagnosis procedures performed and outcome. Postoperative complications, duration of stay, revision surgeries if any were recorded.

We also reviewed the records of all patients admitted to the Neonatal ICU in the above period and among them we selected the ones in which a surgical diagnosis was present. Patients were followed from the time of admission to discharge.

2) Statistical Analysis

The data so collected were entered in excel sheet. Data was analyzed in Microsoft excel software. Data was analyzed in the form of mean, range and percentages.

RESULTS

Four hundred fifty three children were admitted to Pediatric ICU during the study period, of which one hundred eighty three were surgical cases. Four hundred and sixty six babies were admitted to neonatal ICU during the study period of which two surgical cases were noted

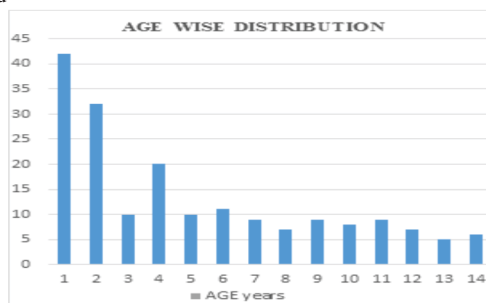


Fig 1: Distribution of patients according to age groups

Table 1: Distribution of patients according to age groups

Age group	No of patients	percentage
0 to 5 years	114	62%
6 to 10 years	53	28%
11 to 14 years	18	10%

Males were 122 (66%) and females were 63 (34%). Largest number 114 (62%) of patients were in the age group 0-5 years followed by 6-10 years age group 53 (28%).

The highest number of admissions were for the OMFS, followed by genitourinary system and central nervous system.

Most common OMFS cases are cleft lip 44(24%), cleft palate 25(14%) Genitourinary conditions accounted for 45 of 185 patients, hydrocele 11(6%) and inguinal hernia 11(6%) was the most common, followed by undescended testis 6(3), hypospadias 5 (2.7%)

Most common gastro-intestinal condition was appendicitis with perforation 10(5.4%)

There were 19 patients with CNS diseases. Out of them 11 (6%) patients had hydrocephalus) and 2 patients had subdural hematoma. The average length of stay was 7 days. Total 185 patients were discharged after treatment with no mortalities.

Table 2: Causes of Pediatric & Neonatal surgical admissions

	No of Admissions	Male	Female
SURGICAL CONDITIONS	76 41% of surgical cases	56(74%)	20(26%)
Hydrocele	11(6%)	11(100%)	0
Inguinal hernia	11(6%)	7(64%)	4(36%)
Appendicitis with appendicular perforation	10(5.4%)	6(60%)	4(40%)
Undescended testis	6(3.2%)	6(100%)	0
Hypospadias	5(2.7%)	5(100%)	0
Abscess	5(2.7%)	2(50%)	2(50%)
Anal verge stenosis/fistula	4(2.1%)	2(50%)	2(50%)
Rectal polyp	4(2.1%)	2(50%)	2(50%)
Cholelithiasis	3(1.6%)	3(100%)	0
Hydronephrosis	2(1%)	2(100%)	0
Small bowel obstruction	1(0.5%)	0	1(100%)
Vitello intestinal duct remnant	2(1%)	1(50%)	1(50%)
Hamartoma	2(1%)	1(50%)	1(50%)
Cyst at ileocecal junction	1(0.5%)	0	1(100%)
Enterocutaneous fistula	1(0.5%)	1(100%)	0
Pyloric stenosis	1(0.5%)	1(100%)	0
Tracheo esophageal fistula	1(0.5%)	0	1(100%)
Goitre	1(0.5%)	1(100%)	0
Eventration of left diaphragm	1(0.5%)	1(100%)	0
Dermoid	1(0.5%)	1(100%)	0
Vestibular anus	1(0.5%)	0	1(100%)
Circumcision	1(0.5%)	1(100%)	0
Necrotizing enterocolitis	1(0.5%)	1(100%)	0

Table 3: Oral and maxillofacial surgery cases

	Admissions	Male	Female
OMFS CASES	90 49% of surgical cases	54(60%)	36(40%)
Cleft lip	44 (24%)	25(56%)	19(44%)
Cleft palate	25 (14%)	14(56%)	11(44%)
Cleft lip with cleft palate	13 (7%)	8(62%)	5(38%)
Cleft alveolus	4 (2%)	4(100%)	0

Palatal fistula	2 (1%)	2(100%)	0
Secondary vermilion defect	2 (1%)	1(50%)	1(50%)

Table 4: Neurosurgery cases

	Admission	Male	Female
Neurosurgery cases	19 10% of surgical cases	12(63%)	7(37%)
Hydrocephalus	11(6%)	6(55%)	5(45%)
Head injury with fracture	2(1%)	2(100%)	0
Sub dural hematoma	2(1%)	2(100%)	0
Astrocytoma	1(0.5%)	0	1(100%)
Arachnoid cyst	1(0.5%)	1(100%)	0
Moya moya disease	1(0.5%)	0	1(100%)
Medulloblastoma	1(0.5%)	0	1(100%)

DISCUSSION

A wide spectrum of surgical conditions affects Indian children. The study results offer insight into the surgical conditions that mostly affect children living in this area.

Primary care can only succeed if supported by an early, efficient and reliable referral system with an infrastructure extending from the primary to the tertiary level, so that pediatric surgical conditions can be treated effectively. Children have distinct surgical conditions and have unique anesthetic challenges. Each child has special perioperative needs which requires a careful postoperative monitoring.

919 children were admitted to PICU and NICU in the above study period. Surgical cases constituted 20% of ICU admissions in our hospital.

The male to female ratio was 1.9:1, this may be due to male patients admitting with genitourinary problems. In a study by Doumi et al⁸ the male to female ratio was 2.5:1

Majority of the patients, fell into four major diagnostic categories - OMFS 90 (49%), followed by genitourinary system 45(24%), central nervous system 19(10%) and gastro intestinal system 17(9%) In our study, these four diagnostic categories accounted for almost 92% of pediatric surgical admissions.

Congenital anomalies were the commonest causes of admission in our study. OMFS cases accounted most of pediatric surgery cases which included cleft lip 44(24%), cleft palate 25(14%), cleft alveolus 4(2%).

Orofacial clefts that are all together, either cleft lip alone or cleft lip along with cleft palate, are considered to be the most typical congenital anomalies of the head and neck at birth.⁹

The estimated incidence of cleft lip and cleft palate, in India is 1 in every 781 live births. The orofacial cleft prevalence is 0.41 per thousand births, as revealed in Indian hospital-based research, is consistent with that of a similar survey conducted in Africa, both being developing nations.¹⁰

These defects not only leads to altered appearance, defective speech, improper hearing, retarded growth of the baby but also deranged psychosocial well-being and disrupted social integration of the parents and family members.⁹

Surgery is the mainstay of treatment for cleft lip repair, which is generally performed between 2 – 3 months of age. However, palate closure is undertaken during 6 - 12 months of age of baby.

Genitourinary conditions accounted second most common for 45 of 185 patients, hydrocele 11(6%) and inguinal hernia 11(6%) was the most common, followed by undescended testis 6(3), hypospadias 5(2.7%), anal verge stenosis 4(2%), rectal polyp 4(2%). Cases with urogenital anomalies were mainly pre-school and school boys with hydrocele and undescended testes discovered by parents.

Neurosurgery cases were the third major category, 19 of 185 patients including 11 (6%) patients had hydrocephalus, and 2 patients had subdural hematoma.

Gastro intestinal conditions were 17 of 185 cases including acute appendicitis with appendicular perforation 10(5.4%), cholelithiasis

3(1.6%), small bowel obstruction and Necrotizing enterocolitis. Major causes of surgical infection were acute appendicitis and its complications in 53.8% of cases, seen at the age of school children usually in late presentations and often misdiagnosed at primary health care settings.⁸

Limitations:

This study was conducted in the tertiary care hospital and it does not reflect true burden of pediatric surgical problems in the community. It needs large community based study to assess true burden of congenital and acquired pediatric surgical problems. Pediatric Trauma cases are excluded in this study.

CONCLUSION

Surgical conditions are important part of pediatric and neonatal care. Management of congenital surgical condition is important to decrease infant and under five mortality and other comorbidities.

Hence, we concluded significant improvement has been achieved in the outcome of Pediatric surgery over the few years. This development has to continue further to achieve parity with international standards. Early recognition, risk stratification of the baby and timely referral to higher Pediatric surgery units is the way forward.

Prenatal counselling should be an essential component of Pediatric surgical practice and should be ensured in the training programme. Healthcare structure, access to Pediatric surgery may account for these differences.

Pediatric surgery should be a child-centered service, has child-friendly facilities with neonatal intensive care units and pediatric anaesthetic support.¹¹ Surgical care should be an essential component of child health programmes in developing countries.

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