

Retrospective Study Pattern of Pediatric Surgical Conditions Outcome in a Tertiary Care Center

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Abstract: ***Aim:** The study was conducted to describe the pattern of presentation and outcome of paediatric surgery patients seeking care in a tertiary care centre in south India. **Methods:** A cross sectional descriptive retrospective study was conducted among paediatric surgery patients admitted for in-patient care in a tertiary care hospital in south India. The study was conducted from June 2023 to June 2024. All patients admitted for in-patient care were included. Clinical data was extracted from case file of the patients. **Results:** The study included total of 60 participants. The study showed that around 69% of the participants were below five years age. Majority of the participants were males (57%). In total 53% of the participants were suffering from acquired health conditions compared to 47% who were suffering from congenital health conditions. Around 97% of the individuals were treated and discharged to home and remaining 3% were referred to other appropriate specialities. The median duration of hospital stay was five days with interquartile range of three to seven days. **Conclusion:** Male predominance present in paediatric surgery patients. Both congenital and acquired conditions had almost equal contribution. Around 97% got discharged to home with median hospital stay of about 5 days.*

Keywords: Congenital anomalies, hospitalisation, Paediatric surgery

1. Introduction

Low- and middle-income countries (LMICs) bear a disproportionate burden of unmet surgical needs. A study conducted in four LMICs (Uganda, Sierra Leone, Nepal and Rwanda) 19% of children aged 0-18 requiring surgical care, and 62% experiencing unmet needs.¹ Nearly about five billion people not having access to surgical treatment in LMICs.^{2,4} WHO's 63rd Health Assembly report has mentioned that 3,03,000 new-borns died within four weeks of life globally due to congenital anomalies.⁵ The global shortage of paediatric surgeons, particularly in developing countries, perpetuates this crisis. India's ratio of 0.28 paediatric surgeons per 100,000 population falls significantly short of the American Paediatric Surgical Association's recommended minimum.⁶

Untreated surgical conditions in children can have devastating consequences, including lifelong disability or mortality.^{2,7} Paediatric surgery patients comprise a distinct group with specific needs and outcomes. The field of paediatric surgery encompasses a broad spectrum of conditions, from congenital anomalies to acute injuries. Effective management of these patients requires a comprehensive understanding of their clinical presentation, treatment outcomes, and factors influencing their recovery, as they present a unique set of challenges due to their varying ages, developmental stages, and diverse range of conditions.

The common surgical conditions in paediatric age groups are due to congenital anomalies and leading cause of mortality.⁵ Apart from being the leading cause of mortality, these conditions can lead to lifelong disabilities affecting families, society and health system.² In the last 50 years there are numerous innovations in diagnosis and management of congenital anomalies.^{8,9} We are witnessing up to 90% success in treating complex congenital anomalies in this era.^{8,9} If the accessibility to all these newer technologies provided in LMICs with adequate quantity we can substantially reduce long term morbidity and mortality. There is need to generate

evidence on pattern of presentation and outcome of paediatric surgery patients to help the policy makers to plan and provide services adequately. Therefore we conducted a study to describe the pattern of presentation and outcome of paediatric surgery patients seeking care in a tertiary care centre in south India.

2. Methods

Study design and setting: A cross sectional descriptive retrospective study was conducted among paediatric surgery patients admitted for in-patient care in a tertiary care hospital in south India. The study was conducted from June 2023 to June 2024

Sampling and sample size: All the patients admitted for in-patient care in department of paediatric surgery at the time of data collection were included in the study. Total of 60 patients were provided with in-patient care during data collection period and all of them were included in the study.

Study procedure: Data regarding clinical characteristics were also extracted from the case files of the participants.

Statistical procedure: The data were entered in the Microsoft Excel and analysed using STATA v14. Continuous variables were expressed as median with inter quartile range (IQR). Categorical variables were expressed as proportions. Outcome of the participants were expressed as proportion as only two types of outcomes were observed.

Ethical Concerns: The study was approved by Institute Ethics committee for human studies. Participants were recruited only after obtaining consent.

3. Results

The study had included total of 60 patients. The median age of the participants was 365 days, with an interquartile range (IQR) of 22 to 1,980 days. The age distribution was as

follows: 16 patients (27%) were 0–28 days old, 16 patients (27%) were between 29 days and 1 year, 9 patients (15%) were between 2–4 years, 17 patients (28%) were between 5–13 years, and 2 patients (3%) were aged 14–16 years. Among the study participants, 26 patients (43%) were female, while 34 patients (57%) were male. Demographic details given in Table 1.

Table 1: Demographic characteristics of the study participants (N=60)

| Characteristics | Categories | Frequency (%) N=60 |
|---------------------------|----------------|-----------------------|
| Age in days, median (IQR) | | 365 (22, 1980) |
| Categories of age | 0-28 days | 16 (27%) |
| | 29 days-1 year | 16 (27%) |
| | 2-4 years | 9 (15%) |
| | 5-13 years | 17 (28%) |
| | 14-16 years | 2 (3%) |
| Gender | Female | 26 (43%) |
| | Male | 34 (57%) |

Off the total participants 28 (47%) children were suffering from congenital health conditions, and 32 (53%) children were suffering from acquired conditions. The participants were suffering from various diseases, including undescended testis (10 cases, 17%), abscess (7 cases, 12%), phimosis (7 case, 12%), appendicitis (6 cases, 10%), trauma (6 cases, 10%), burns (4 cases, 7%), cleft palate (4 cases, 7%), hydronephrosis (2 cases, 3%), intussusception (1 case, 2%), meatal stenosis (1 case, 2%), necrotizing enterocolitis (1 case, 2%), prepatellar bursitis (1 case, 2%), pyloric stenosis (1 case,

2%), tracheoesophageal fistula (TEF) (1 case, 2%), and tongue tie (1 case, 2%). Details given in Table 2.

Table 2: Clinical characteristics of the study participants (N=60)

| Characteristics | Categories | Frequency (%) N=60 |
|-----------------------------|------------------------|-----------------------|
| Nature of Health Conditions | Congenital | 28 (47%) |
| | Acquired | 32 (53%) |
| Diagnosis | Undescended testis | 10 (17%) |
| | Abscess | 7 (12%) |
| | Phimosis | 7 (12%) |
| | Appendicitis | 6 (10%) |
| | Trauma | 6 (10%) |
| | Burns | 4 (7%) |
| | Cleft palate | 4 (7%) |
| | NEC | 4 (7%) |
| | Tongue tie | 4 (7%) |
| | Hydro-ureteronephrosis | 2 (3%) |
| | Intussusception | 2 (3%) |
| | Meatal stenosis | 1 (2%) |
| | Pre patellar bursitis | 1 (2%) |
| | Pyloric stenosis | 1 (2%) |
| | TEF | 1 (2%) |
| | Undescended testis | 10 (17%) |

We were able to witness good outcome with minimal duration of hospital stay. The median duration of hospital stay was 5 days, with an IQR of 3 to 7 days (Fig 1). At discharge, 56 patients (93%) were discharged home, while 4 patients (7%) were referred for further care from other specialities (Fig 3). Among the referred cases 2 each among male and female (Fig 2).

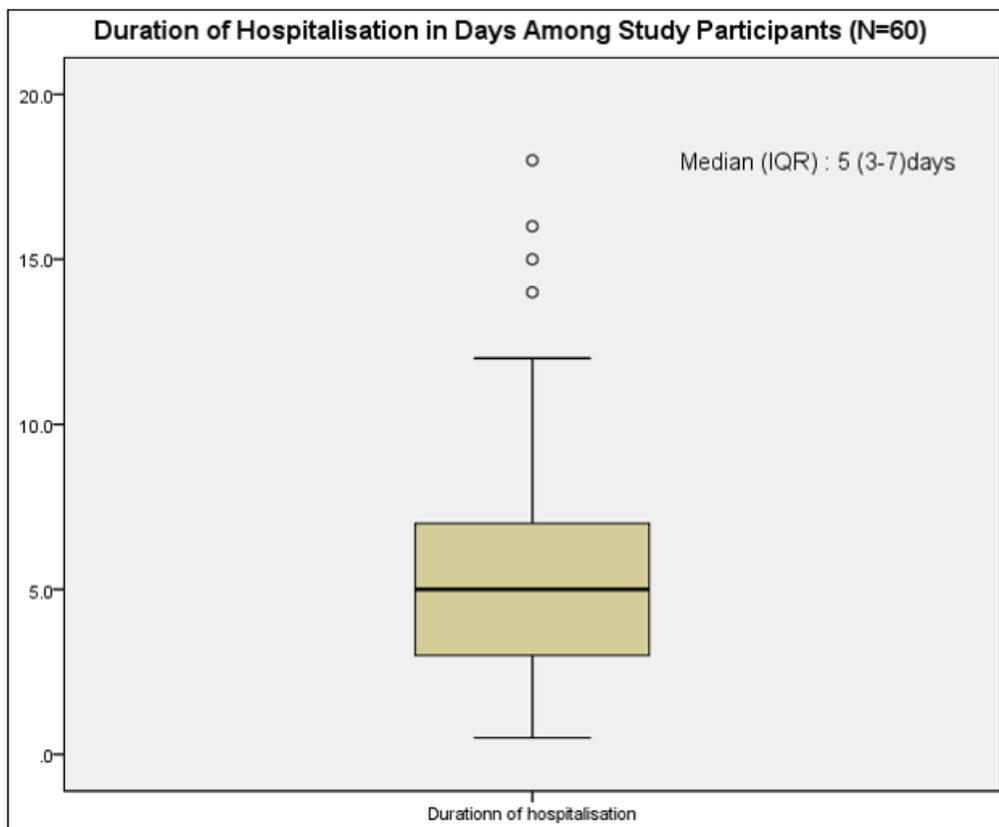


Figure 1: Duration of hospital stay among study participant (N=60)

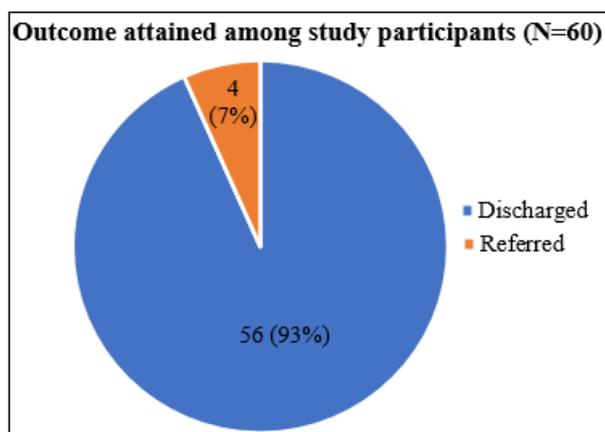
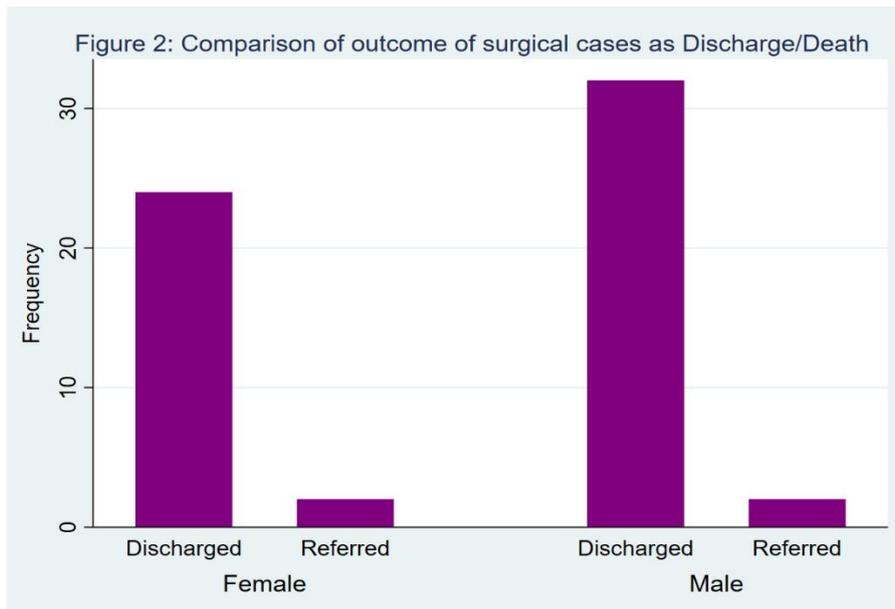


Figure 3: Clinical outcome among study participant (N=60)

4. Discussion

The current study was conducted to describe the pattern of presentation of the paediatric surgery patients and outcome attained after receiving in-patient care from department of paediatric surgery. It is important to know about the pattern of presentation to plan and prioritise the care for the patients.

The study showed that around 69% of the participants were below five year age. Majority of the participants were males (57%). In total 53% of the participants were suffering from acquired health conditions compared to 47% who were suffering from congenital health conditions. Around 97% of the individuals were treated and discharged to home and remaining 3% were referred to other appropriate specialities which were not primarily in purview of paediatric surgery.

Majority of the study participants were in the under-five age group which could be due to general surgeons providing surgical care as the age of the patient increase. It may be also due to diagnosis of congenital conditions at this stage. Kaur G et al also had reported similar findings in their study where majority of the participants were below age of four year.¹⁰

In the current study majority of the participants were males (57%) which may be due to prevalent male urogenital

conditions. In the current study most common diagnosis was undescended testis which would support the male dominance further. Kaur G et al and Doumi et al also had reported male predominance in their studies.^{10,11}

In our study it is observed that 53% of the participants were suffering from acquired health conditions. Even though commonest diagnosis observed was undescended testis which is congenital condition, overall acquired health conditions were had major share in the case presentation to department of paediatric surgery. This finding was contrast to the finding shown in literature where it has reported that congenital anomalies are the most common conditions presented to paediatric surgeons.¹¹⁻¹⁴ Other health conditions reported in the current study were abscess (7 cases, 12%), phimosis (7 case, 12%), appendicitis (6 cases, 10%), trauma (6 cases, 10%), burns (4 cases, 7%), cleft palate (4 cases, 7%), hydronephrosis (2 cases, 3%), intussusception (1 case, 2%), meatal stenosis (1 case, 2%), necrotizing enterocolitis (1 case, 2%), prepatellar bursitis (1 case, 2%), pyloric stenosis (1 case, 2%), tracheoesophageal fistula (TEF) (1 case, 2%), and tongue tie (1 case, 2%). We could notice that cases with infection were at the top of the chart among acquired health conditions followed by trauma. Kaur G et al also reported that around 31%v of the acquired conditions were abscess which required simple procedure which is similar to our study findings.¹¹ Among congenital anomalies reported in the current study, undescended testis is the most common condition followed by phimosis. Agarwal A et al.¹⁵ had mentioned that the most common anomalies were neural tube defects, of about 24.3% of the participants, followed by ano-rectal malformation in 20.7% of participants, and then tetralogy of Fallot (TOF) in 20% participants.

The median duration of hospital stay in the current study was five days with IQR of three to seven days. The study conducted by Temesgen Firomsa., et al.¹⁶ reported the average length of hospital stay as 4.3 days. A study by Peiffer et al.¹⁷ to determine predictors of poor postoperative outcome, length of hospital stay was reported to be 3.0 days. J.S. Karpelowsky et al.¹⁸ has mentioned that the median length of hospital stay

in their study participants was 4 days. The findings were almost similar among all the studies.

In the present study around 97% were discharged to home and 3% were referred to other specialities. Kaur G et al¹¹ also reported that 97.4% were discharged to home and 2.6% of mortality. However in our study there was no mortality reported, with similar success rate reported by Kaur G et al.¹¹ It shows that care provided by paediatric surgeons could significantly improve the outcome among paediatric surgery patients. These findings advocates for improving facilities to provide paediatric surgical care. Policy makers should consider these findings while budgeting for health services and also while designing health related education courses.

5. Limitations of the Study

The study was conducted in hospital and included only who got admitted to our centre. These findings may not be true representative of burden in the community. As the study was conducted in tertiary care centre, many of the minor surgical conditions wouldn't have been reported in the study findings, as they would have been treated in secondary care centres.

6. Recommendation

There is a need of population based study to understand the true burden of the surgical conditions in paediatric age group and unmet need. Paediatric surgery care should be provided in all tertiary care centre to improve the outcome.

7. Conclusion

Male predominance present in paediatric surgery patients. Both congenital and acquired surgical conditions had almost equal contribution. Around 97% got discharged to home with median hospital stay of about 5 days.

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