

ORIGINAL ARTICLE

PEDIATRICS SURGICAL ADMISSIONS AND PROCEDURES: A FIVE-YEAR EXPERIENCE AT TIKUR ANBESSA SPECIALIZED HOSPITAL IN ADDIS ABABA

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ABSTRACT

Background: Children develop distinct surgical conditions, present unique anesthetics challenges and have special peri-operative need. Childhood surgical diseases are as common in the developing world as they are in developed countries. Available evidence shows that Sub-Saharan Africa has the highest unmet need for surgical care, constituting 41 million cases per year, 29% of the world's unmet need. It is estimated that 2.6 million children are born with a congenital anomaly in Sub-Saharan Africa each year. To date there has been limited data published on pediatrics surgery from this region. In Ethiopia, there is insufficient data on pediatric surgical conditions.

Objective : The primary aim of this study was to describe the burden of pediatric surgical disease at a referral hospital and assess if there is any change in the admission pattern and scale of service.

Methods: This was a cross-sectional study with retrospective data collection on general pediatrics surgical patients (< 13yrs.), who had surgery done in Tikur Anbessa Specialized Hospital (TASH) in Addis Ababa.. Children who had undergone surgery during between September 1, 2012 and August 31, 2017 were included in the study. The required data was entered onto and analysis using the Statistical Software for Social Sciences (SPSS) version 23 and analyzed.

Results: A total of 4,538 pediatrics patients were admitted and operated. Their age ranged from 12 hours to 13 years with median (IQR) age of 48(12 -96) months. Out of this, neonates accounts for 734 (16.2%), infants for 808 (17.8%), children one-five years of age 1,741 (38.4%) and above age of five years 1,255 (27.7%). Male: Female (M:F) ratio was 2.2:1. Of all cases, 2,737 (60.3%) were emergency and 1801(39.7%) were elective cases. Congenital conditions were the leading indication for admission and procedure accounting for 2,158 (47.6%), followed by trauma, which accounted for 970 (21.4%).

Discussion: We found that congenital anomalies were still the most common group of pediatrics condition that required surgery in our setting. There was a significant increase in the number of foreign body ingestion and aspiration compared to previous reports in studies. Intussusception is still among the top 10 causes of surgical procedures despite introduction of hydrostatic reduction in the past three years.

Conclusion: The study has shown that there is still a high burden of pediatrics surgical conditions in our setting and congenital anomalies are on the rise. Stakeholders and policy makers need to take this into account when national surgical plans are designed.

Key words: Pediatrics surgery, Patterns of Admissions, Procedures, Ethiopia, Global surgery

INTRODUCTION

Children develop distinct surgical conditions, present unique anesthetics challenges and have special pre-operative need. The consequences of pediatric surgical conditions may be life long since they affect children at critical times during growth and development. Childhood surgical diseases are as common in the developing world as they are in developed countries. Injuries, congenital anomalies and surgical infections are the most common surgical problems that affect African children, and these conditions pose a major health threat to children. (1,2)

Available evidence shows that Sub-Saharan Africa (SSA) has the highest unmet need in surgical care in the world, which stands at 41 million cases per year constituting 29% of the world's unmet need.

Nine percent of the global surgical burden of disease is attributable to congenital anomalies (3).

It is estimated that 2.6 million children are born with a congenital anomaly in SSA each year (3,4). To date, there has been limited data published on pediatrics surgery in SSA. The majority of published data were single institutional studies and many with limited numbers. In Ethiopia, as in other Sub-Saharan Africa countries, there is insufficient data on pediatric surgical conditions.

Tikur Anbessa Specialized Hospital (TASH) is a tertiary teaching hospital located in the capital of the country, Addis Ababa. It is one of the few specialized hospital in the country providing pediatrics surgical services and it is the only public hospital providing specialized pediatrics surgical service.

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It provides general medical services for the local populations and for referred patients from all parts of the country.

The pediatrics surgery unit is under the department of surgery in the School of Medicine of Addis Ababa University. Currently there are seven pediatrics surgeons, two pediatrics surgery fellows and 16 pediatrics surgery residents under training. There are forty beds allocated for pediatrics surgery in the hospital.

There are two reports on pediatrics surgical admissions and procedure from our hospital. The first was done 20 years ago and the later one 11 years back. In this study, we aim to describe the burden of pediatric surgical disease at TASH and intend to see if there is any change in the admission pattern and volume of procedures done. We describe demographics, admission diagnoses and different epidemiological data.

PATIENTS AND METHODS

This was a cross-sectional study with data collected retrospective on pediatrics surgical patients (< 13years of age), who had surgery done in TASH between September 1, 2012 and August 31, 2017.

Children who had undergone surgery during the study period were included in this study. Data was collected from the operative log books.

Data including the socio-socio-demographic characteristics of the patients, admission diagnosis, operative procedures and other concomitant illnesses were obtained from the operative log book. It was then processed using SPSS version 23 and analyzed. All children who underwent general pediatric surgical intervention were included in the study.

Pediatric surgical cases who needed cardiac, orthopedic and neurosurgical intervention, ophthalmologic and plastic and reconstructive cases were excluded from the study. Minor out-patient general pediatrics surgery procedures were also not included in the study. A data extraction form designed for this purpose was used in data collection.

Ethical consideration: Data collection was undertaken after ethical clearance was obtained from the departmental IRB.

RESULTS

Pediatrics surgery service delivery over the five-year period is shown in Figure 1.

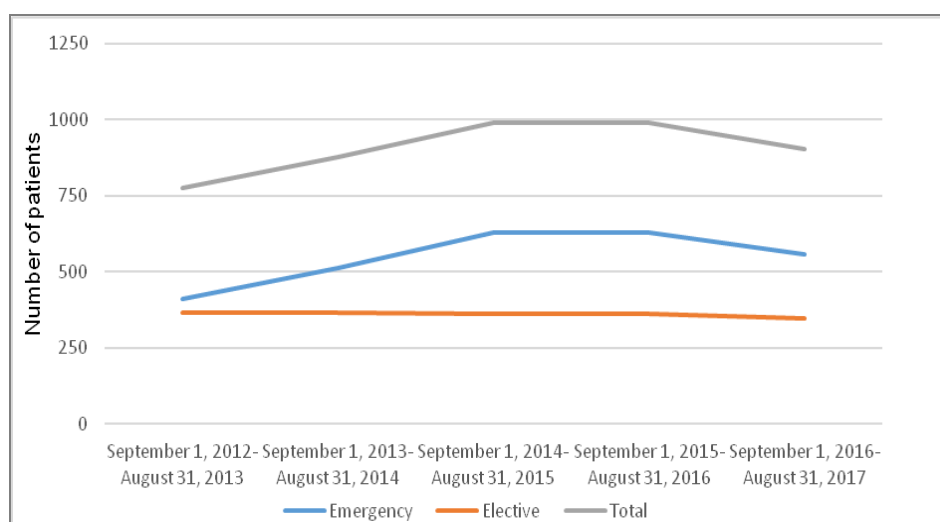


Figure 1: Pattern of pediatrics surgical procedures in Tikur Anbessa Specialized Hospital, Addis Ababa, September 1, 2012 and August 31, 2017.

The total number of pediatrics patients who were admitted and had surgical procedures done during the study period was 4,538. Their age ranged from 12 hours to 13 years with median (IQR) age of 48 (12-96) months. Neonates accounted for 734 (16.2%), infants for 808 (17.8%), children one to five years of age for 1741 (38.4%) and above age of five years for 1,255 (27.7%). Male: Female ratio was 2.2: 1.

Of all cases, 2,737(60.3%) were emergency and 1801 (39.7%) were elective cases. Congenital malformations were the leading indication for admission and procedure accounting for 2158 (47.6%) followed by trauma 970 (21.4%). Inflammatory conditions accounts for 639 (14.0%), infectious 264 (5.8%), tumor 213 (4.7%) and other surgical conditions were 294 (6.5%).

Gastrointestinal (GI) system was the commonest system affected and it was seen in 2,121 (46.73%) patients. The urinary system was involved in 878 (19.34%) of the patients. It was followed by respiratory system which accounts for 448 (9.87%) and musculoskeletal system which accounts for 306 (6.79%).

Anorectal malformation was leading congenital malformation in our setup. It accounted for 19% of gastrointestinal and 8.8% of general pediatrics surgical admissions. Hirshsprung disease was the second commonest cause of GI, comprising 296 (13.9%) of GI admissions and procedures. Appendicitis 316 (14.9%) and intussusception 187 (8.8%) were the two most common acquired emergency abdominal conditions requiring admission and intervention. (Table 1)

Ingested foreign body accounted for 10% of the admissions, while foreign body aspiration accounted for 7.9% of all surgical admissions. Hypospadias, 201 cases, was the leading urology condition that needed admission and had surgical procedures done. It accounted for 4.4% of the total pediatrics surgical admissions. It was followed by undescended testis (2.7%) and congenital obstructive posterior urethral membrane (COPUM) (2.5%) (Table 2).

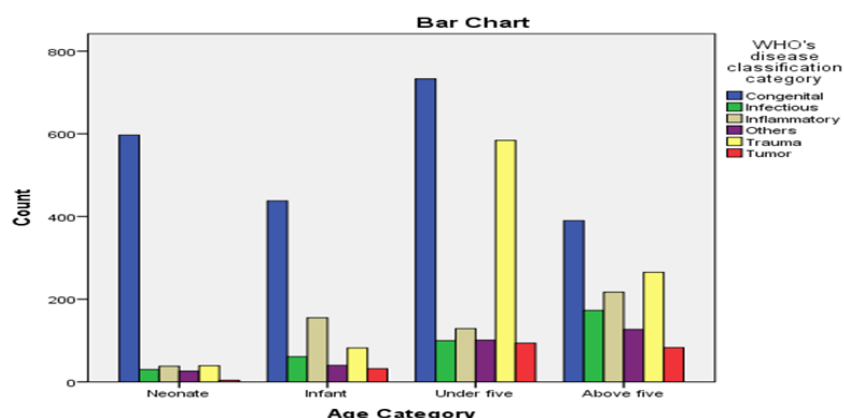


Figure 2: WHO disease classification and age category of patients in Tikur Anbessa Specialized Hospital, Addis Ababa, September 1, 2012 and August 31, 2017.

Table 1: Top ten congenital anomalies requiring surgical intervention in Tikur Anbessa Specialized Hospital, Addis Ababa, September 1, 2012 and August 31, 2017.

Diagnosis	Frequency	Percentage
1. Anorectal malformation	403	8.9%
2. Aganglionic megacolon	296	5.8%
3. Hypospadias	201	4.4%
4. Inguinal hernia	140	3.1%
5. Undescended testis	123	2.7%
6. EA with/without TEF	116	2.6%
7. IHPS*	144	2.6%
8. Congenital obstructive posterior urethral membrane	112	2.5%
9. Congenital abdominal wall defects	57	1.3%
10. Bladder exstrophy-epispadia complex	47	1.0%

EA (Esophageal atresia), TEF (Tracheoesophageal fistula), IHPS (Infantile hypertrophic pyloric stenosis), COPUM (Congenital obstructive posterior urethral membrane)

*IHPS is currently considered to be acquired disease, but since the pathophysiology of IHPS begins in utero we included under congenital anomalies.

Table 2: Common pediatric surgical admissions in Tikur Anbessa Specialized Hospital, Addis Ababa, September 1, 2012 and August 31, 2017.

Diagnosis	Frequency	Percentage
1. FBS	453	10.0%
2. Anorectal malformation	403	8.9%
3. FBA	360	7.9%
4. Appendicitis	316	6.9%
5. Aganglionic mega colon	296	5.8%
6. Hypospadias	201	4.4%
7. Intussusception	187	4.1%
8. Inguinal hernia	140	3.1%
9. Undescended testis	123	2.7%
10. IHPS	117	2.6%
11. EA with/without TEF	116	2.6%
12. COPUM	112	2.5%
13. UCF	88	1.9%
14. Congenital abdominal wall defects	57	1.3%
15. Wilms tumor	57	1.3%

FBS (Foreign body swallowing), FBA (Foreign body aspiration), IHPS (Infantile hypertrophic pyloric stenosis), EA (Esophageal atresia), TEF (Tracheoesophageal atresia), COPUM (Congenital obstructive posterior urethral membrane), UCF (Urethro-cutaneous fistula).

DISCUSSION

During the study period, 4,538 pediatric surgical patients were operated in TASH. General pediatrics surgery as a unit does not include pediatrics plastic surgery, pediatrics otolaryngology, pediatrics neurosurgery and pediatrics orthopedics surgery patients. Minor out-patient general pediatrics surgery procedures were also not included in the study. In the study done 10 years ago in our hospital included all pediatrics surgical procedures done in the hospital (5).

We found that congenital anomalies are still the most common group of pediatrics condition that requires surgery in our setting. This is similar to data from other developing countries. (1,2,6, 7). Anorectal malformation is the leading congenital anomalies in our setting accounting for 403 (8.9%) of the surgical admissions and procedures. In the previous study it accounts for 4% (243) of procedures (5). The percent increase might be due to general surgical conditions like appendicitis are widely handled in other hospital by general surgeons while neonatal surgeries and other infrequent complex low-volume pediatrics surgical procedures are only done in our hospital.

But there is also absolute increase in number which might be because of high population growth rate or increased health seeking behavior among our society.

Community based prevalence study must be done to know the actual prevalence and to understand the root causes of a rise in congenital anomaly in our country. (Figure 2)

During the period between 1990 and 2016, congenital anomalies increased from the seventh most common cause of death in children under 5 years of age, to the fifth most common (8). This increase places congenital anomalies ahead of HIV, tuberculosis (TB) and malaria as a cause of death among children under five years of age. However, efforts to focus the global health agenda on surgical diseases have been largely unsuccessful and have not received the same high-profile funding efforts exemplified by the Global Fund to fight AIDS, TB and malaria and the Gavi Vaccine Alliance (9,10). However, a study done in the United States showed that congenital anomalies are not among the major causes of top 20 admissions and procedures (11). The reason could be the country's birth rate which remains flat and growth of the 0- to 18-year-old pediatric population that continues at a slow 0.65% per year (12). Therefore, the absolute numbers of such index cases would be expected to increase at a similar slow rate.

Appendicitis is the leading causes of surgical admission and procedures in States (11). This was also seen in our setting in the previous studies (5).

In our study, acute appendicitis comprised only 6.9% of admissions, making it the fourth common cause of admission after foreign body swallow/aspirations and anorectal malformation. As we have mentioned earlier the reason could be as a result of the fact that appendicitis is being handled in all general hospitals in the country.

There was significant increase in number of foreign body ingestions and aspirations compared to previous studies. There were 813 cases of foreign body ingestions and aspirations during the study period. This was 2.5 times that of the previous report, which was 331 in the same setting (5). On the average, 163 cases of foreign body ingestions and aspirations are seen per year. This increase might be due to a new one-birr coin which was introduced five years back as the removed foreign body was mainly from the esophagus and it was found to be a one-birr coin. It was bigger in size and prone to stuck in esophagus than spontaneous passage. In our setting we remove foreign body using McGill forceps under laryngoscope since the foreign body stuck usually in the proximal part of the esophagus (13). In one of the studies done in a private health institution in Addis Ababa showed that flexible endoscopy was a very safe and efficient method of timely diagnosis and removal of ingested FBs in children and adults in trained hands to prevent life threatening complications (14).

Intussusception is still in the top 10 causes of surgical admissions and procedures despite introduction of hydrostatic reduction in the past three years (15). It accounted for 187 (4.1%) of admissions and procedures. This number only includes those cases of intussusception that needed laparotomy. This might be due to late presentation of our patients to health institution. The operative procedures ranges from manual reduction to extended colectomy.

In some of the studies from Sub-Saharan Africa shows that injuries are still the most common admission diagnosis accounting for 46.9% in Gambia and 51% in Malawi (1,16). (Table 2)

Blunt and penetrating trauma to the abdomen and chest is not a major cause of admissions in general pediatrics surgical unit in our setup. There were 113 cases of general pediatrics trauma that warrants admission in TASH during the study period. These accounts for 2.4% of all admissions. Out of this blunt trauma accounted for 81.4 % of all trauma cases. Trauma to the abdomen, chest and genitourinary system were 42, 35 and 36, respectively.

In the study, done a year back in our setting showed that trauma accounts for 5.3% of emergency pediatrics surgical admissions (17).

The delivery of safe, effective surgical care to children is a critical but neglected area within global surgical efforts (16) Recognizing the unmet need for surgical care in Ethiopia, the Federal Ministry of Health (FMOH) has pioneered innovative methodologies for surgical system development with Saving Lives through Safe Surgery (SaLTS). SaLTS is a national flagship initiative designed to improve access to safe, essential and emergency surgical and anesthesia care across all levels of the healthcare system. That is a good initiative to address the gaps of making surgical care accessible (18).

Conclusion and recommendation: There is still a high burden of pediatrics surgical conditions in our setting and congenital anomalies seem to be on the rise in our setting. Given this high burden of pediatrics surgical conditions in our hospital, we recommend that the pediatrics surgical services in the country needs to be expanded to address this unmet surgical demand.

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