

A Prospective Study on the Pattern of Pediatric Surgery Admission in a Tertiary Referral Hospital in Egypt

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Abstract

Background: The pattern of pediatric surgical admission at zonal hospital is poorly documented in developing countries. This poor documentation usually makes difficult to analyze the mortality, morbidity and factors affecting the outcomes of these surgical problems.

Aim of Study: The aim of this study is to analyze the pattern of admissions of children at the first decade of life at pediatric surgery units for elective and emergency cases at our referral hospital in one year duration.

Patients and Methods: This prospective study was including all admissions of children at the first decade of life into the pediatric surgical unit either elective or emergency cases from 1 st of January 2019 to 1 st of January 2020 at one of biggest referral hospital in Egypt. All data was collected from the individual patient medical records which obtained from pediatric surgery and emergency unit.

Results: The total admissions of children at the first decade of life to pediatric surgical wards at our referral hospital were 2575. The Emergency cases (1195 cases) were classified into traumatic and non-traumatic cases, While, elective and outpatient cases were 1380 (53.5%) and 580 of them presented with congenital anomalies. We classified our outcome into discharged (92.1 %), died (4%) and Discharged Against Medical Advice (DAMA).

Conclusions: Lack of data and poorly documented information affects proper monitoring of performance and outcome of pediatric surgical cases in developing countries. However, our mortality rate was lower than other studies in developing countries, the presence of specialized well trained staff and well equipped hospital for pediatric surgery will help in decreasing the mortality rate more and more.

Key Words: Pediatric surgery – Admission – Referral hospital.

Introduction

NOWADAYS, pediatric surgery has not only become an independent specialty but has evolved into a multidisciplinary field of medicine. In de-

veloped countries pediatric surgery should be well organized, having its own wards, manpower facilities and handles specific aspect of pediatric surgical pathology. So, the outcomes for the surgical care of children have benefitted dramatically as a result of advanced surgical techniques, parenteral nutrition, pediatric intensive care and pediatric anesthesia [1,2].

Congenital abnormalities, trauma and infection are the most common surgical diseases in children in Africa. However, Trauma is the leading cause of morbidity and mortality in African children. Also Malignancy remains one of the major causes of the death in children between the ages of 1-15 years [3].

However, the hospital pediatric surgical admission data is a valuable tool for assessing the epidemiology of diseases within populations. The Pattern of pediatric surgical admission at zonal hospital in many developing countries is poorly documented. So that, mortality, morbidity and factors affecting the outcomes were difficult for analysis despite many children with surgical illness have been managed at these levels [4,5].

Aim of the work:

The aim of this work is to analyze the pattern of admissions of children at the first decade of life at pediatric surgery units for elective and emergency cases at our referral hospital in one year duration.

List of Abbreviations:

TOF : Tracheo-Osophageal Fistula.
DAMA : Discharged Against Medical Advice.
SPSS : Statistical Package for Social Sciences.
IO : Intestinal Obstruction.

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Patients and Methods

This prospective study was conducted at the pediatric surgery unit and pediatric emergency unit at Tanta University Hospitals, one of biggest referral hospital in Egypt. The study site serves population of approximately 5 million persons.

Our study was including all admissions of children at the first decade of life into the pediatric surgical wards either elective or emergency cases from 1st of January 2019 to 1st of January 2020.

We excluded all patients aged more than 10 years old at admission and all pediatric cases admitted to the Orthopedic, ENT and Ophthalmology department either elective or emergency.

Data collection and analysis:

Data was collected from the individual patient medical records and patients' case files which obtained from pediatric surgery and emergency unit. The study Information included patients' age, sex, diagnosis, duration of hospital stay, type of procedure or surgical intervention and outcome defined as discharged home, transferred to the ward, discharged against medical advice or died. Diagnosis of the diseases was done by the attending doctors and residents based on the clinical features and available laboratory results.

The collected data were described with tables using SPSS version 15. Ethical approval was obtained from the surgical ethical committee (Ethical Committee No 1765 2020 Surgery). Privacy and confidentiality of all patients' information was maintained.

Results

Demographic data:

Total admissions of children at the first decade of life to pediatric surgical wards were 2575 during our study. Emergency cases were presented in 1195 patients (46.5%) while elective and outpatient cases were 1380 (53.5%). Children were divided into 5 age groups as presented in Table (1). The highest percentage of patients was in the second group from 1 year to 3 years (33.3%) with a male/female ratio of 2: 1.

Diagnosis:

The various diagnoses were grouped into 2 categories according to mode of admissions; Emergency and outpatient cases. Emergency cases were 1195 and were classified into traumatic and non-traumatic cases. Traumatic patients were 1079 out of 1195 emergency cases (42% of all admissions) with the commonest causes of injuries were head

trauma 403 cases (15.7% of all admissions) Fig. while non-traumatic patients were 116 out of 1195 emergency with the intestinal obstruction represented the most common cause of non-traumatic patients (3.6% of all admissions) Fig. (2), while appendicitis represented only (0.6% of all admissions).

Table (1): Demographic data.

Incidence	Elective and outpatient cases		Emergency cases	
	Number	Percent	Number	Percent
	1380	53.5	1195	46.5
	Groups		No. of patients	Percentage
Age at admission	1 day-1 year		683	26.5
	>1 year-3 years		860	33.3
	>3 years-5 years		486	18.9
	>5 years-7 years		290	11.2
	>7 years-10 years		256	9.9
	Male		Female	
	Number	Percent	Number	Percent
Sex	1720	66.8	855	33.2
Male/female ratio = 2/1				

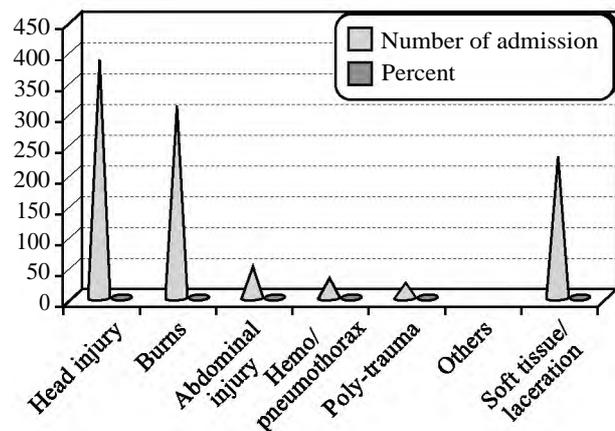


Fig. (1): Types of Traumatic admissions in Emergency Room.

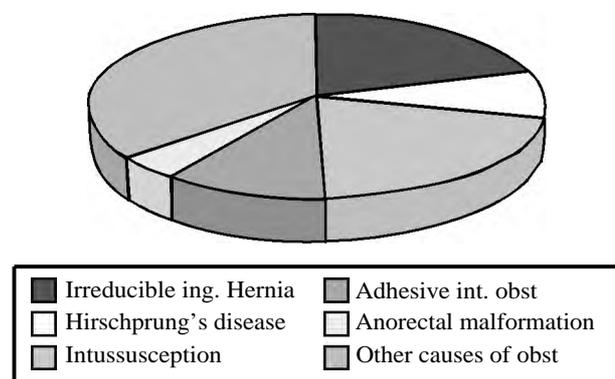


Fig. (2): Types of IO admissions in emergency room.

Outpatient presented in 1380 cases, 580 of them presented with congenital anomalies, the commonest congenital anomalies were Inguinal hernia 147 cases (5.7% of all admissions) Fig. (3). Surgical infections were the commonest cause of outpatient admission and second commonest cause of all admissions and accounting for (29.7% of all admissions) and Gastrointestinal conditions patient were 35 cases represented only in 1.3% of all admission.

Hospital stay:

Most of patients (1100 patients) were operated from 2 days to 7 days of admissions with 776 patients of them were operated within 24 hours of admission. Some operations (18 cases) were delayed for more than one week because some cases needed correction of electrolytes or laboratory results or due to chest infection. Conservative management only with no surgical intervention was required in 681 patients (26.4% of all admissions).

As regard post-operative hospital stay, out of 1894 cases, 1075 (56.8%) cases stayed only one day post operative, while only 145 (7.7%) cases stayed more than 7 days post operative because of post operative complications as hemorrhage, intestinal obstruction, wound infection or gastrointestinal anastmotic leak. Table (2).

Outcome:

Surgical admissions were 2575 cases, 1894 (73.6 %) cases were managed surgically while 681 (26.4 %) cases not operated, outcome was classified into discharged (91.1%), died (4%) and Discharged Against Medical Advice (DAMA) (4.9%). There were 104 cases died of all admissions either pre or post operative with mortality rate (4%). The distribution of pediatric surgical death was as follows: Trauma (83.7%), congenital anomalies (7.7%), intestinal obstruction (3.8%) and other causes (4.8%). Generally the mortality in pre or postoperative period was mainly due to sepsis, shock, respiratory distress or toxemia which could be due to delayed presentation. Table (3).

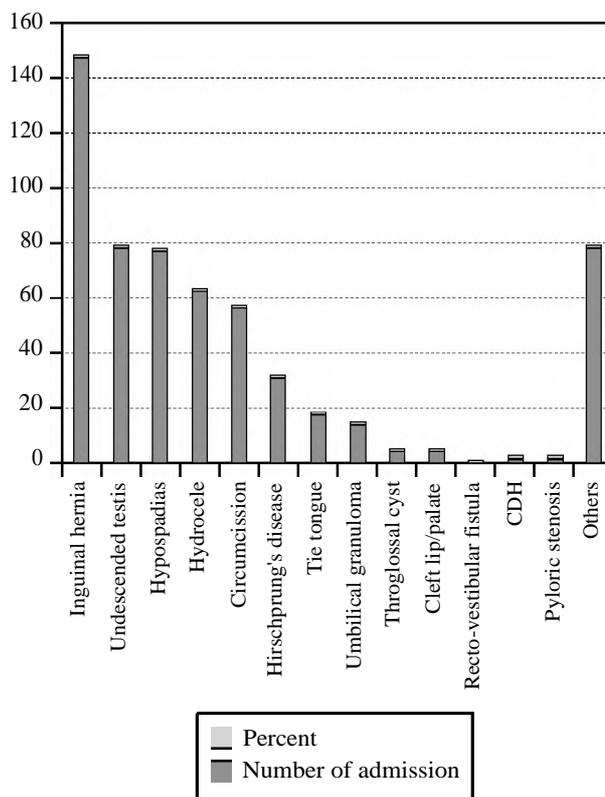


Fig. (3): Types of Congenital anomalies in Children admitted.

Table (2): Hospital stay.

Pre-operative hospital stay	Number	Percentage
1 day	776	30
2-7 days	1100	42.8
>7 days	18	0.8
Not operated	681	26.4
<i>Post-operative hospital stay:</i>		
1 day	1075	56.8
2-7 days	674	35.5
>7 days	145	7.7

Table (3): Outcome of all admissions.

Diagnosis	Surgical intervention N	Conservative treatment N	Outcome			Total N
			Discharged N	Died N	DAMA N	
Congenital Ing. Hernia	167	0	167	0	0	167
Hirschprung's disease	40	0	36	3	1	40
Undescended testis	78	0	76	0	2	78
Hypospadias	77	0	77	0	0	77
Anorectal Malformation	5	0	4	1	0	5
Thyroglossal cyst	5	0	5	0	0	5
Cleft lip/Palate	5	0	4	1	0	5
Umbilical granuloma	15	0	15	0	0	15
Tie tongue	18	0	18	0	0	18
Circumcision	57	0	57	0	0	57
Congenital Diaphragmatic hernia	3	0	3	0	0	3
Pyloric stenosis	4	0	3	1	0	4
TOF	3	0	2	1	0	3
Rectal prolapse	2	1	2	0	1	3
Sacrococcygeal teratoma	1	0	1	0	0	1
Appendicitis	16	0	16	0	0	16
Splenomegally	5	0	5	0	0	5
Intestinal obstruction	55	10	51	4	10	65
Abscess / cellulitis	490	22	512	0	0	512
Excision of mass	163	0	158	0	5	163
Burns	228	89	281	25	11	317
Head injury	253	150	343	53	7	403
Abdominal injury	51	7	46	5	7	58
Hemo / pneumothorax	28	3	24	4	3	31
Soft tissue injury/laceration	100	140	225	0	15	240
Others	25	259	241	5	38	284
Total	1894 (73.6%)	681 (26.4%)	2372 (92.1)	103 (4%)	100 (3.9%)	2575 (100%)

Discussion

The burden of pediatric surgical diseases in Egypt is not exactly known. There is poverty in population-based research and publications. This lack of data has negatively affected the adequate planning and delivery of pediatric surgical services [6].

Evaluation of pediatric surgery unit whether retrospectively or prospectively should be periodically carried out as information obtained from admissions data, which could give an insight into the existing services with aims of improving them. It would also help in defining priority areas which will help in planning disease preventive and intervention programs for the pediatric population [6,7].

Knowledge of the pattern of admissions into the pediatric surgery either traumatic or non-traumatic would provide valuable information on the progress of the preventive programs already in place. However, according to our knowledge a very little literatures discuss the pattern of surgical

admissions in pediatricsurgery in developing countries [7,8,9].

Our study was conducted on 2575 cases at the age of first decade of life admitted in Pediatric surgery Unit (either emergency or outpatient) of Tanta University Hospitals one of the biggest referral hospital in Egypt from 1st of January 2016 to 1st of January 2017, aiming to evaluate pattern of admissions including age, sex, diagnosis, types of surgical procedures and outcome.

In our study, we classified our patients into 5 age groups with most of our patients presented in the age group (1-3) years represented by 860 patients. Also, There was significant difference among the studied groups regarding age distribution and this result was matched with Eck C et al., [10] that revealed significant difference among the studied groups regarding age. However this age result was different from Tekle TT and Mollalegne TM, 2016 [4] regarding the age due to small number of patients included in their study. Also this result was different from that of Ambaye M and Tefera

M, [7] regarding the age because in their study age ranges between 7 days and 15 years. Also this result was different from that Kendig CE et al., 2014 [9] regarding the age because in their study age ranges between 1 day and 17 years.

In our study, emergency cases represented (46.5%) of all cases while elective and outpatient cases represented (53.5%) of all cases and this results was similar to result of Osifo OD, et al., 2010 [1] and different from that of Tekle TT and Mollalegne TM, [4] as in their study, emergency cases were predominating (73.1%) and elective cases were less common (26.2%).

Over all in our result the most common diagnostic categories were trauma (42%), surgical infection (29.7%), congenital anomalies (22.5%) and gastrointestinal problems (1.3%) and this result was matched with that of Stephen W and Sanno-Duanda B, 2000 [5] and Kendig CE et al., [9] as they recorded that, the most common diagnostic categories were injuries (46.9%), surgical infection (24.3%) and congenital anomalies (14.5%). However, Tekle TT and Mollalegne TM, [4] and Alagoa PJ and Gbobo I, [8] were different from our results because in their studies congenital anomalies were the most common cause of admissions (37.8%) followed by trauma (28.4%).

In our study head trauma was the leading diagnosis in category of trauma (15.7%) followed by burns (12.3%) and this result was matched with that of Tekle TT and Mollalegne TM, [4] as they showed that head trauma represented (13.4%) followed by burns (11.6%). However this result was different from that of Bradshaw CJ et al., [11] who stated in their study that, common injuries were laceration (30%), fractures (28%) then head injury (10%).

In our study Intestinal obstruction was the leading cause of non-traumatic admissions from emergency room. It was represented in 97 cases (3.6 %) of all cases , with death of 4 cases (3.8%) and this result was matched with Opara PI et al., [12], in their study in Southern Nigeria. They reported that, intestinal obstruction represented (15.9%) of all cases with mortality rate (5.3%) of all surgical admissions, also Memon MA et al., [13] reported that, intestinal obstruction represented (32.5%) of all admissions with mortality rate (16.6%). So they had much higher mortality rate and this may be due to sepsis, shock, respiratory distress, toxemia and delayed presentation. However we disagree with Alagoa PJ and Gbobo I, [8], who reported in their study that appendicitis (8%)

was the leading cause of gastrointestinal condition that admitted from emergency room. Also in Gambia Stephen W and Sanno-Duanda B, [5] reported that, intestinal obstruction represented (4.6%) of all cases with mortality rate (0.2%) of all surgical death.

In our study, the mean length of hospital stay was 4.7 days and there were significant difference among the studied groups regarding the duration of hospital stay post operatively and this result was matched with that of Tekle TT and Mollalegne TM, [4]. However this result was different from that of Alagoa PJ and Gbobo I, [8] as they reported that the mean duration of hospitalization was 8.6 ± 11.2 days. The shortest duration of hospital stay was 1 day while the longest duration was 90 days because of nosocomial sepsis and wound infection.

In our study, traumatic patients represented (42%) of all admissions with mortality rate (3.6%) of all surgical death. In Gambia Stephen W and Sanno-Duanda B, [5] reported that, Injuries were responsible for the largest number of admissions (46.9%) with mortality rate (48%) of all surgical death and this high mortality rate was due to burden of referral hospitals and lack of emergency management. However, in Malawi Kendig CE et al., [9] reported that, trauma represented (50.9%) of all admissions with mortality rate (2.4%) of all surgical death and this result was lower than ours.

Mortality rate (4%) in our study is lower than other results in developing countries as reported by Tekle TT and Mollalegne TM, [6], Kendig CE et al., Stephen W and Sanno-Duanda B, 2000, Opara PI et al., Sowande OA et al., and Osifo OD et al., [1,4,5,9,11,14] because our hospital is a big referral hospital that receive cases from the surrounding centers and rural hospitals, also well trained specialists in pediatric surgery unit is the main cause of this rate.

Generally, in developing countries, the overall mortality rate was high in both pre and post operatively. Some of these patients had been taken to herbalists and other alternative sources of treatment before presentation to hospital. This contributed to delays in presentation and worsening of the clinical outcome. Also, parental misconceptions of that newborns cannot withstand surgery, poor transportation system, lack or inadequate pre-transfer resuscitation and stabilization, lack of neonatal intensive care facilities is also likely to play significant role and contribute significantly to the mortality rate in these patients. Also inade-

quate compliance with standard practices in trauma care is associated with an increased risk of death in African countries.

Conclusions: Lack of data and poorly documented information affects proper monitoring of performance and outcome of pediatric surgical cases. Presence of specialized well trained staff nurses and well equipped hospital with neonatal intensive care with ventilator and nutritional support help in decreasing the mortality rate. Also, in traumatic cases further work is still needed to fully outline local issues in pediatric trauma prevention and management.

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دراسة مستقبلية حول نمط قبول الحالات السريرية في قسم جراحة الأطفال في مستشفى جامعة طنطا في مصر

تم إجراء هذه الدراسة لتقييم وتحليل نمط دخول الحالات إلى قسم جراحة الأطفال سواء كانت حالات إختيارية أو طارئة في مستشفى جامعة طنطا وذلك لأنه نحن نفتقر إلى بيانات محددة حول العدد، العمر، الجنس، التشخيص، أنواع التدخلات الجراحية ونتائج حالات جراحة الأطفال وذلك لتقديم حلول لتحسين الرعاية في المستقبل. وقد أجريت هذه الدراسة على ٢٥٧٥ مريضاً تم إدخالهم إلى مستشفى جامعة طنطا لوجود مشكلة جراحية أو تطورت مشكلة جراحية بعد الولادة. أجريت الدراسة لمدة سنة واحدة في الفترة ما بين ١ يناير ٢٠١٦ و ١ يناير ٢٠١٧.

تم جمع البيانات من السجلات الطبية للمريض وملفات حالة المرضى التي تم الحصول عليها من قسم جراحة الأطفال وقسم الطوارئ، وشملت الدراسة على معلومات عن أعمار المرضى والجنس والتشخيص وعدد أيام الإقامة في المستشفى وأنواع التدخل الجراحي ونتائج التدخل والتي تم تعريفها وتقسيمها إلى (الخروج للمنزل أو النقل إلى جناح أو الخروج ضد المشورة الطبية أو الوفاة).

وكان عدد الحالات الطارئة ١١٩٥ حالة بنسبة (٤٦.٥٪) من إجمالي الحالات وتم تقسيمها إلى حالات متعلقة بالإصابات الجراحية وحالات غير متعلقة بالإصابات الجراحية. كان عدد الحالات المتعلقة بالإصابات الجراحية ١٠٧٩ حالة، وكان الأكثر شيوعاً منها الإصابة بالرأس (١٥.٧٪) بينما الحروق (١٢.٣٪) ثم الإصابة بالبطن (٢.٣٪). كان عدد الحالات الغير متعلقة بالإصابات الجراحية ١١٦ حالة وتشمل إلتهاب الزائدة الودية ١٦ حالة (٠.٦٪)، الإنسداد المعوي ٩٧ حالة (٣.٨٪)، حالتين ضيق بالبواب وحالة واحدة تعاني من فتق خلقي بالحجاب الحاجز. بينما كان عدد حالات العيادة الخارجية ١٣٨٠ حالة بنسبة (٥٣.٥٪) وتشمل التشوهات الخلقية (٢٢.٥٪)، مشاكل الجهاز الهضمي (١.٣٪) والعدوى الجراحية (٢٩.٧٪).

كان هناك ١٠٤ حالة وفاة من مجموع حالات الدخول سواء قبل أو بعد العملية الجراحية بمعدل وفيات ٤٪. وتم توزيع أسباب الوفاة الجراحية للأطفال كما يلي: الإصابة (٨٣.٧٪) ثم التشوهات الخلقية (٧.٧٪) ثم الانسداد المعوي (٣.٨٪) وأسباب أخرى (٤.٨٪). وكان السبب الرئيسي للوفاة سواء قبل أو بعد التدخل الجراحي هو تعفن الدم، الصدمة، الضائقة التنفسية وتسمم الدم والتي قد تكون بسبب العرض المتأخر على المستشفى.