

PAEDIATRIC SURGICAL MORTALITIES: PRIMARY CAUSES OF DEATH IN A RURAL TERTIARY HOSPITAL IN SOUTH-SOUTH NIGERIA

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ABSTRACT

Background: The knowledge of the primary causes of death in a particular practice locality can influence health systems interventions for better outcome among paediatric surgical patients. This formed the basis of this study.

Methods: This study was a cross-sectional study in which all paediatric surgical (0 – 17 years) mortalities from August 2016 to April 2022 in Irrua Specialist Teaching Hospital (ISTH) were reviewed. The categorical variables were analysed as frequencies and proportions, and presented in tables.

Results: Sixty-one mortalities were recorded for paediatric surgery patients during the period of review. Thirty-six (59.0%) of the patients were males while 25 (41.0%) were females. The paediatric surgical mortalities constituted 15.4% of all childhood deaths (61 of 396 childhood deaths) in the period of study. Of the 13,952 children admitted in the hospital during the period, the percentage of paediatric surgery mortalities is 0.4%. Injuries/accidents (18, 29.5%), Congenital disorders (16, 26.2%), Gastrointestinal diseases (9, 14.8%), Cancers (9, 14.8%), Surgical infections (8, 13.1%) and Cardiac diseases (1, 1.6%) are the commonest primary causes of paediatric surgical deaths in this centre.

Conclusion: Policy makers in this senatorial district should be guided by the observed common primary causes of death in decision making as regards the necessary investment in paediatric surgical care relevant to improve outcomes.

Keywords: Paediatric surgery, Primary cause of death.

INTRODUCTION

The knowledge of the primary causes of death in a particular practice locality can influence health systems interventions for better outcome among paediatric surgical patients.¹ Many factors have been postulated to contribute to the higher mortality rate recorded among children managed for paediatric surgical conditions in third world countries.²⁻⁵ Factors that increase mortality risk include neonatal age, pre-existing conditions, delayed presentation, emergency surgery, multiple procedures, malnutrition, lack of adequate intensive care amongst others.²⁻⁵

The commonly reported primary causes of death in paediatric surgical practice

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include sepsis, especially in post-operative patients, congenital anomalies like Tracheoesophageal fistula (TEF)/ Esophageal atresia (EA), Gastroschisis, and Intestinal atresia.

Others are surgical and post-operative complications, intestinal/anastomosis failure, hypovolemia, peritonitis, notably

from perforated viscus, respiratory failure, and complications from conditions like obstructed inguinal hernias.²⁻⁵

The assessment of the pattern and the primary causes of death will help to identify the indicators of poor outcomes in order to improve overall outcomes in paediatric surgical cases, hence the need for this study.

MEHODS

This study was a cross-sectional study in which all paediatric surgical (0 – 17 years) mortalities from August 2016 to April 2022 in Irrua Specialist Teaching Hospital (ISTH) were reviewed. ISTH, a tertiary health facility located in a rural setting, is situated in Irrua, the administrative headquarters of Esan Central Local Government Area of Edo State, Nigeria.⁶ It is a 434-bed hospital with medical and surgical wards.

Data collected included demographic characteristics, primary cause of death and

managing unit for each patient. The categorical variables were analysed as frequencies, and proportions and presented in tables.

RESULTS

Sixty-one mortalities were recorded for paediatric surgery patients during the period of review. Thirty-six (59.0%) of the patients were males while 25 (41.0%) were females. The paediatric surgical mortalities constituted 15.4% of all childhood deaths (61 of 396 childhood deaths) in the period of study. Of the 13,952 children admitted in the hospital during the period, the percentage of paediatric surgery mortalities is 0.4%.

The age and sex distribution of the patients is shown in Table 1. The primary causes of death are shown in Table 2 while mortalities recorded in each managing units are shown in Table 3. Figure 1 shows the primary causes of death in each age group.

Table 1: Age and sex distribution of paediatric surgery mortalities

Age group	Male	Female
Neonate 0 – 28 days	11	13
Infant >1mth – 12mth	4	2
Toddler >1yr – 3yrs	2	0
Preschool >3yrs – 5yrs	2	1
School >5yrs – 12yrs	8	4
Adolesct >12yrs – 17yrs	9	5
TOTAL	36	25

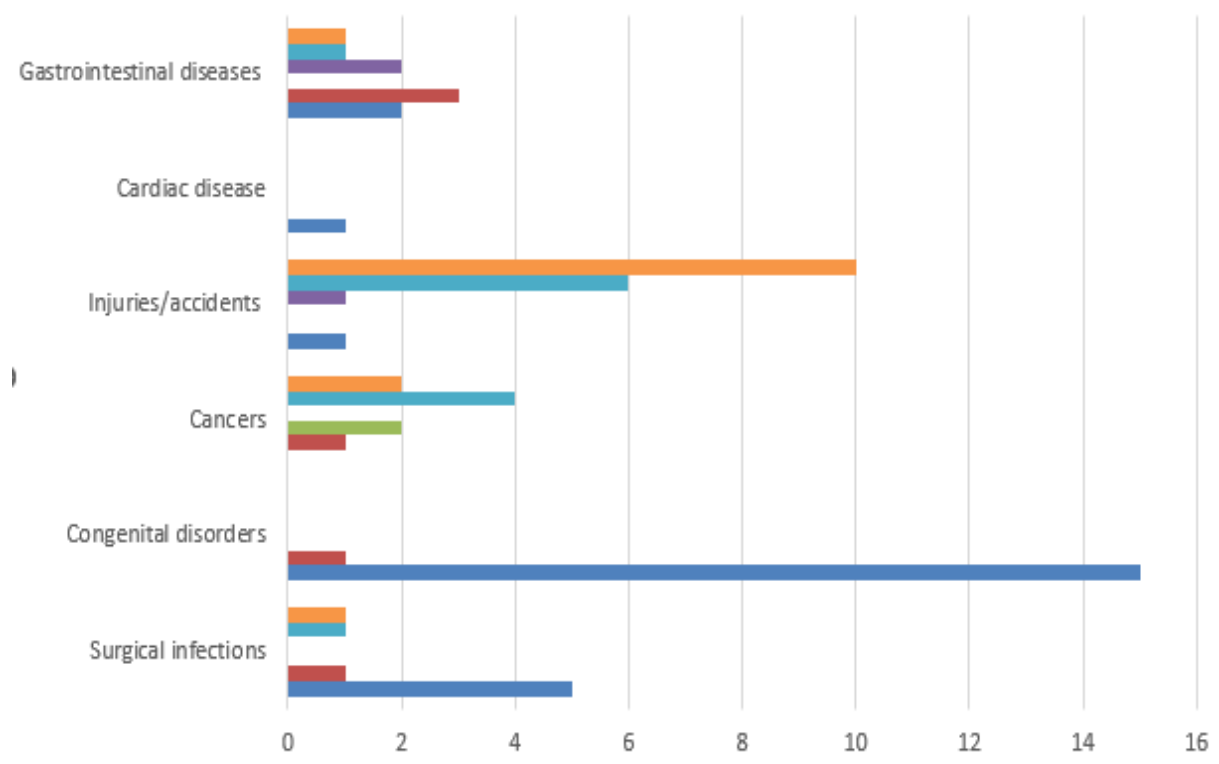
Table 2: Primary causes of death by gender distribution

Category	Male	Female
Surgical infections	4	4
Congenital disorders	8	8
Cancers	6	3

Injuries/accidents	13	5
Cardiac disease	0	1
Gastrointestinal diseases	5	4
TOTAL	36	25

Table 3: Mortalities recorded in each managing units

Managing Unit	Number of deaths recorded
Neonatology	24
Neurosurgery	17
Trauma	15
Cardiothoracic	4
Gastroenterology	17
Plastic Surgery	8
Oncology	7
Orthopedics	2
ENT	1



KEY	
	Neonate
	Infant
	Toddler
	Pre-school Child
	School Child
	Adolescent

Figure 1: Primary causes of death in each age group

DISCUSSION

Adequate organisation and investment in paediatric surgical care are generally expected to reduce mortality and morbidity in paediatric surgical practice in any part of the world; much more in the rural setting.^{1,3} It thus becomes very important to know the common primary causes of death in the rural setting as this will influence the necessary investment in paediatric surgical care relevant to improve outcomes.^{1,3}

The 61 paediatric surgical mortalities recorded during the period of study constituted 15.4% of all the 396 childhood deaths. This poses a significant challenge and shows that paediatric surgical mortalities are a key, but not the dominant, contributor to overall childhood deaths in the centre. In a study on mortality by admission diagnosis in children 1-60 months of age admitted to a tertiary care government hospital in Malawi, Choi et al reported that the highest mortality rates by diagnosis were found in children with surgical conditions.⁷ Generally, various reports have shown that childhood mortality rates are still quite high in lower-middle-income countries (LMICs), especially in parts of Africa and south Asia.^{2,4,8-13}

More male deaths (36, 59.0%) were recorded in the period of study. This can be explained by the fact that injuries/accidents were the commonest primary cause of death in the study and boys are more likely to be involved because of their more adventurous nature. Chowdhury et al in their study on Mortality from Surgical Conditions in Children in Bangladesh recorded Male to female ratio of 1.95:1 which is comparable to the finding in this study.¹³ However, Gharavifard et al reported that females were more likely than males to die after an operation (52.8%).¹⁴

Among all the paediatric age group stratifications, neonates had the highest number of deaths (24, 39.3%). This is a common report in almost all studies on paediatric surgical mortalities.^{3,5,9,12,13,15,16} The high mortality rates among neonates have been attributed to factors like delay in presentation, delay in making diagnosis of surgical conditions, delay in the provision of care once at a medical facility, inadequate facilities, limited and inexperienced manpower.^{12,13,15-18} The adolescent age group (14, 23%) was second to the neonatal age group in terms of number of deaths. This is likely due to the fact that adolescents were involved in injuries/accidents more than other age groups. Many authorities have reported injuries/accidents as the commonest cause of death among the adolescent age group.¹⁹⁻²²

Injuries/accidents were the commonest primary cause of death in the study, followed by congenital disorders. The study carried out by Choi et al in 2020 revealed similar findings regarding the primary causes of death among children. Their report showed that the majority of paediatric surgical deaths are due to injuries, followed by congenital conditions, tumours and abdominal conditions.²³ Globally, prematurity and congenital anomalies are more commonly associated with mortality in paediatric surgery.²⁴ However, some available regional data show that neonatal/infant age group and emergency surgeries are the main predictors of mortality, while the most frequent direct cause of death is said to be sepsis, particularly in neonates and infants.^{3,4,25}

Apart from the neonatology unit (24, 39.3%), significant paediatric surgical deaths were recorded in Neurosurgery unit (17, 27.9%), Gastroenterology unit (17, 27.9%) and Trauma unit (15, 24.6%). Most of the cases in Neurosurgery and Trauma units were as a result of injuries/accidents.

In conclusion, this study demonstrated that, in descending order, Injuries/accidents, Congenital disorders, Gastrointestinal diseases, Cancers, Surgical infections and Cardiac diseases are the commonest primary causes of paediatric surgical deaths in this centre. Policy makers in this senatorial district should thus be guided in decision making as regards the necessary investment in paediatric surgical care relevant to improve outcomes.

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