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Research Article

The Socio-Economic Impact of Typhoid Intestinal Perforation in Children in a Developing Country

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Abstract

Background: Typhoid intestinal perforation is a common cause of post-operative wound complications and occurs in various severities, which often lead to serious financial crisis due to the prolonged and high demanding course of management.

Aim: This study is to review the socio-economic burden of management of typhoid post-operative wound complications in children in a low income country.

Materials and Methods: It's a 7-year retrospective study of 95 children aged ≤ 15-years with typhoid intestinal perforation, reviewing the patients' home location, family size, parents' occupations; post-operative wound complications of typhoid intestinal perforation and their cost of treatments, length of hospital stay and the role of the social intervention programmes of the hospital.

Results: Eighty-one (85.3%) parents are manual workers, 6(6.3%) junior civil servants, 3(3.2%) are businessman, policeman, and a retired civil servant respectively, while (5.3%) children are orphans. Sixty-seven 67(70.5) patients had various grades of postoperative wound complications, out of which 10(14.9%) died and 57(80.1%) were subsequently managed out of whom 17(29.8%) were re-operated. The overall increase in treatment due to management of post-operative wound complications was 69.4% average of about 135.16 USD, ranged 100.98-169.34 USD as a result of re-operations, secondary wound closures, wound dressing items and bed fees, while about 91.13USD, and ranged 89.40-95.16USD spend by patients without post-operative wound complications on just and bed fee.

Conclusion: Management of typhoid post-operative wound complications is a huge economic burden to be completely left for patients and their relatives alone to handle.

Keywords: Cost of treatment; Post-operative wound complications; Typhoid intestinal perforation

Introduction

Typhoid intestinal perforation a common household disease is still a prevalent surgical infection in children in developing countries, contribute to major surgical morbidities and mortalities in them [1,2]. This is because poverty, improper waste handling and lack of adequate portable drinking water are still major basic social amenity issues, especially in Sub Saharan Africa where there is high civil conflicts and natural disasters, in addition to high population explosion and rural to urban migrations [3,4]. These factors have allowed typhoid intestinal perforation to remain a serious health burden in children in most developing countries, accounting for majority of the many emergency surgeries in them and, contributing significantly to their morbidity and mortality [5,6]. This is in addition to the huge economic burden in its management, especially in the face of serious post-operative complications like enterocutaneous fistulae, wound dehiscence, and intra-abdominal abscesses that often leads to prolonged and protracted period of management, thus leading to serious financial crisis [7]. That is further worsen by the patient's poor social status, lack of health insurance cover and out of pocket payment system in most of the hospitals in developing countries unlike in developed societies [8].

Our study is aim at evaluating the economic burden of treatment of typhoid post-operative wound complications in children in a developing country, and the place of social intervention programme in their treatment.

Materials and Methods

In a retrospective study of 95 confirmed cases of typhoid intestinal perforation in children aged ≤ 15 years from June 2010-May 2016, we analyzed their home location, family size, parents' occupation; the post-operative wound complications, and their cost of treatment, length of hospital stay, and the role played by the poppers fund scheme. During the study period, the average exchange rate was about Naira 406 to a United States Dollar (USD). We also analyzed the intra operative findings and the procedures performed. Diagnosis of typhoid intestinal perforation was made from clinical features, plain abdominal X-ray, and intra operatively.

Results

In the 7-years review, there were 47 (49.5%) boys and 48 (50.5%) girls. Their mean age is about 8.87±2.96 years, ranged (4 -15) years, and the mean hospital stay was 21.5±16.1, ranged (2-114) days. There were more 31(31.6%) cases of typhoid perforation amongst children aged 6-7 years old (Figure 1), probably hygienic eating habit is poor amongst them.

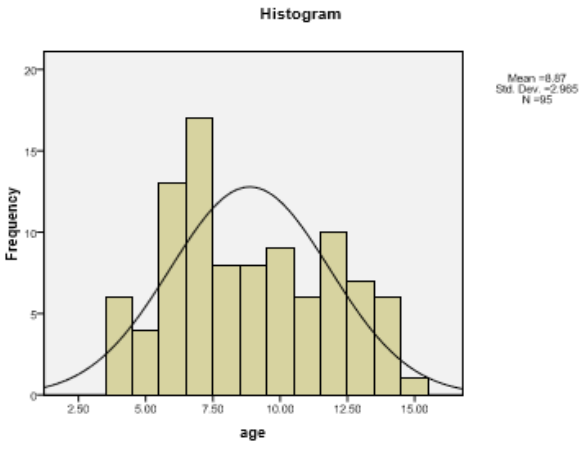

Figure 1: Graph depicting age of the study population. 36.1% of the cases were between 6 and 7 years, followed by those of 12 years (10.6%).

A large 81(85.3%) percent of the parents were self-employed low income manual workers (Figure 2). The rest were: 6 (6.3%) junior civil servants and 3(3.2%) policeman, businessman and a retired civil servant respectively, while 5(5.3%) children are orphans. Sixty-five (68.4%) children reside in high densely populated neighbourhoods, while the remaining 30 (31.6%) resides in the Government Reserved Areas (G.R.A) which has low population and good sanitation and water supply. The average family size is about 7.22±2.10 children per family and majority about 73(76.8%) of them are from such large families. While about 24 (25.3%) families had at least 8 children each, 21(22.1%) had 7, and 10(10.5%) had 9 and 6 children respectively (Figure 3).

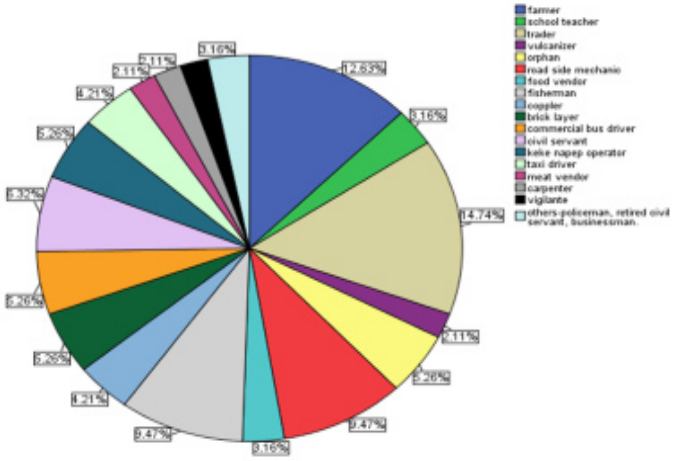

Figure 2: Distribution of the occupational status of the patient's parents'; economic status of parents.

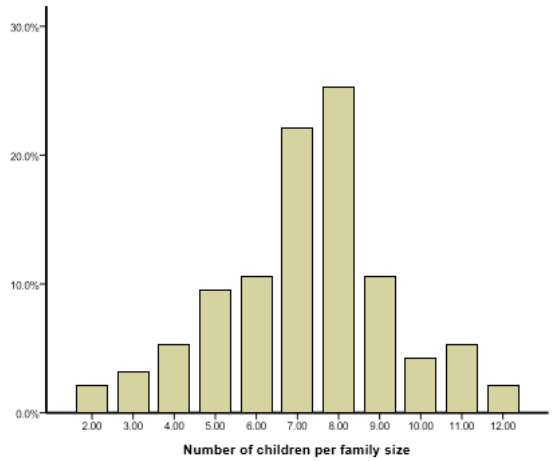

Figure 3: An estimate of family size according to number of children in the family.

All the cases had exploratory laparotomy at a subsidized fee for children with surgical emergency of 86.21USD, under general anaesthesia without muscle paralysis after adequate volume resuscitation. Seventy-eight (82.1%) patients had single intestinal perforations each, 12(12.6%) had two, and 5(5.3%) had more than two. In terms of procedure performed 44(46.3%) patients had

simple closure, 39(40.1%) had segmental resection, 8(8.4) had resection with ileo-ileal anastomosis, and 4(4.2%) had limited right hemi-colectomy with ileo-colic anastomosis.

About 67(70.5%) patients developed various grades of post-operative wound complications, out of whom 10(14.9) eventually died of sepsis and 57(85.1%) were subsequently managed, which included 17(29.8%) re-operations. Overall there were 25(43.9%) patients with superficial SSIs, 19(33.3%) deep incisional SSIs, 9(15.8%) enterocutaneous fistulae and 4(7.0%) complete burst abdomens received various categories of treatments for post-operative wound complications which were just wound dressing with normal saline and honey, secondary wound closures and re-operations.

The extra treatments and increased length of hospital stays resulted in average spending of about 135.16 USD, ranged 100.98-169.34 USD in them which is about 69.4% increase in cost of treatment, while only about 91.13USD, ranged 89.40-95.16USD was expended by patients without complications. The average cost expenditure on wound dressing items per patient is shown in table 1.

An estimate of spending on post-operative wound dressing and secondary wound closures (USD)	Frequency (%)
15.32	14(20.9)
17.24	7(10.4)
19.70	5(7.4)
19.89	4(5.9)
22.46	8(11.9)
24.78	3(4.5)
24.96	5(7.4)
27.17	2(2.9)
29.85	8(11.9)
48.95	11(16.4)
250.32	67(100.0)

Table 1: Shows the estimate of average individual patients' spending on dressing items and secondary wound closures due to Typhoid Intestinal Perforation (TIP) surgical site infections.

About 49 (86.0%) of these patients had some serious financial crisis due to the increase demand of treatment and were assisted by the poppers scheme with funds which help with the cost of re-operations in some and wound dressing items

Discussion

Typhoid perforation is one of the most frequent causes of post-operative wound complications in developing countries [9], and it occurs in such severity that it is seldom difficult to manage them without leading to financial crisis especially in systems in which patients pay for health services from their pockets due to limited health insurance. And unfortunately it is the less privileged amongst us, who often cannot cope with any form of financially demanding treatment that suffers most from typhoid perforation and is serious related post-operative wound complications [10]. Some of these patients that do not complain of financial difficulty are the ones with less serious types of the post-operative wound complications like superficial surgical site infections that may not be financially demanding or are being cared for by collective members of the family. Otherwise, financial challenges are common in the management of typhoid post-operative wound complications especially in the face of serious ones like enterocutaneous fistulae and wound dehiscence [11]. Because these serious post-operative wound complications often requires re-operations, therefore, leading to additional spending in their treatments [12]. Such finding was also observed in about 49(73.1%) patients in our report with enterocutaneous fistulae, deep incisional surgical site infections, and burst abdomens who also had serious financial challenges during management, and had to be assisted from the poppers fund with cost of re-operations, secondary wound closures and dressing materials [13].

Finally, our public hospitals need to put up an alternative intervention rescue plans like the poppers fund scheme for the less privileged with chronic health conditions, who cannot afford expensive and demanding treatments. Such coffers can be serviced by the wealthy, politicians and donor agencies and it should have more than one signatory for accountability. Otherwise wise, a large multicenter, inter and intra-regional collaborative studies on the socioeconomic burden of children with surgical infections like typhoid perforation is also necessary to raise awareness towards a subsidised health service for less privileged children by our governments. Even though there will be variability in data interpretation due to differences in currency exchange rates and hospital finance structure; the need to report the socioeconomic burden of typhoid perforation especially in Africa is long overdue due to its still high prevalence [14]. A study on such issue should also be clear and specific and interpretation of its results should not be difficult amongst decision makers. Just like our report was focused on the cost of re-operations, secondary wound closures and wound dressing items in management of typhoid post-operative wound complications was clear, without divulging into the cost of anti-biotic treatments, intravenous fluids, blood transfusions, investigations, intensive care stay, feeding, and readmissions which we believe will lead to complexity and confusion in understanding our report. Because if the variables are segregated it will make understanding the problem of post-operative wound complications clear and easy., especially when appealing for financial assistance on behalf of these patients. This was how were able to get the poppers fund committee to understand our challenges and got funds released for second surgery, secondary wound closures and dressing items.

To minimise bias, in data interpretation, we relied on

the billing unit for records of all the payments made for the re-operations, secondary wound closures, dressing items and length of hospital stays. This is in addition to the patients' case notes, the ward procedure book for grades of wound complications and list of dressing items and duration of wound dressing.

Conclusion

Without doubt typhoid intestinal perforation is a common and it's also the common cause of surgical infection in children from developing countries which leads to serious socioeconomic burden that is so huge to be totally left in the hands of the patients and their relatives.

Acknowledgments

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