

## **Perspectives on Paediatric Surgical Admissions at El Obeid Hospital, Western Sudan.**

El Bushra Ahmed Doumi\*.

### **Abstract:**

**Background:** Data on the burden of paediatric surgical diseases at Western Sudan are unknown.

**Objectives:** To determine the burden and pattern of childhood surgical problems presenting to a General Surgical Unit at Western Sudan.

**Patients and Methods:** The records of all children aged 15 years and below admitted to the University General Surgical Unit at El Obeid Hospital, Western Sudan over two years were studied. The mean age, gender, the clinical diagnosis and the outcomes of the management were determined.

**Results:** There were 574 patients. 410 (71.4%) were males. The mean age was 6.2 years  $\pm$  SD 4.7. Congenital anomalies, trauma, and surgical infections accounted for 40.2%, 32.3% and 24.9% respectively. Cancer was found in 1.9% of patients.

**Conclusions:** Many of the childhood surgical problems admitted to hospital are preventable if appropriate community measures are actively considered. There is a need for specialized paediatric surgery unit in the context of a children hospital, attached to or nearby the women hospital.

**Key words:** Congenital anomalies, childhood injuries, surgical infections.

In developing countries children constitute a major sector of the general population. Children require and certainly deserve the highest level of surgical care. For decades in Sudan and other developing countries general surgeons were doing a great job in rural areas regarding the management of paediatric surgical problems. They deserve to take a pride in their achievements, although they always need to define referral criteria.

The problems range from lack of awareness and late presentation, through shortage of relevant personnel and lack of equipments and facilities to poor financing. Many of the affected neonates and infants were further disadvantaged with illiterate parents, inadequate intrauterine nutrition, trans-placental infections, prematurity, poor obstetric care and complete absence of foetal medicine.

As the community develops, the burden of those problems needs to be outlined in order to plan for establishment of more specialized service in the future.

This study is focused to highlight the load of paediatric surgical diseases and their burden on the inpatient service in a general surgical unit at a rural setup in Western Sudan.

### **Patients and Methods:**

El Obeid Teaching Hospital is the main referral hospital for the Kordofan States of Western Sudan with a population of about 4.3 millions including 2.2 million children (5<sup>th</sup> Sudan Census, table No 4; 2008). The burden of childhood surgical disease management is taken over by general surgeons, due to the absence of paediatric surgical units.

In the current study the records of children aged 15 years and below who were cared for in the University General Surgical Unit during the period from January 2005 to December 2006 were studied. The data were analyzed for age, gender, clinical diagnosis and outcomes of management, using the SPSS PC packages version 11.5. The vision and observations of the author were briefly outlined.

### **Results:**

During the study period 574 children were admitted. 410 (71%) were males. The age

---

\* The University Surgical Department, El Obeid Teaching Hospital, Faculty of Medicine & Health Sciences, University of Kordofan, El Obeid, Sudan.  
Correspondence to: elbushradoumi@hotmail.com

ranged from one day to 15 years. The mean age was 6.2 years  $\pm$  SD 4.7. Neonates and infants were 112 patients (19.5%).

The clinical diagnoses were shown in table 1.

Table 1: Clinical Diagnosis. n=574

Clinical diagnosis	No (%)
Congenital anomalies	231(40.2)
Trauma	185(32.3)
Surgical infections	143(24.9)
Cancer	011(1.9)
Intestinal obstruction (Non congenital)	004(0.7)
Total	574(100)

The types of congenital anomalies were shown in table 2. All hernias were operated (79 cases of which 14 were obstructed). Cases with anterior abdominal wall defects were conserved. Hirschsprung's disease and ano-rectal malformations had temporary colostomies before being referred to paediatric surgery units.

Table 2: Congenital anomalies n=231(40.2%)

Clinical Diagnosis	No (%)
Hernia	79(34.2)
Gastrointestinal	63(27.3)
Neural tube defects	32(13.9)
Genito-urinary	16(6.9)
Abdominal wall defects	14(6.0)
ENT	11(4.8)
Musculoskeletal	06(2.6)
Neurovascular	06(2.6)
Lymphatic	04(1.7)
Total	231(100)

Patients with neural tube defects, hypospadias and ectopia vesica were also referred to higher centres; while children with cleft lips, pyloric stenosis, undescended testes and rectal polyps were operated locally. Two patients with duodenal atresia had bypass operations, one survived. Three neonates with jejunal atresia had resection and anastomoses all died post-operatively.

Common causes of trauma were limb fractures (39.5%), burns (20.5%) and head

injury (18.9%). Soft tissue injuries were 14.6% and snake bites were 6.5%. All trauma patients were successfully managed except for 6 cases of head injuries referred to neuro-surgery and other 4 cases with severe head injuries that died in our wards together with 5 cases of burns. The mortality rate in trauma patients was 4.9%.

Surgical infections accounted for 143 cases. Acute appendicitis was the commonest diagnosis (53.8%), followed by abscess and superficial cellulites (23.1%) and bone & joint infection (18.9%). Mycetoma foot and cervical lymph adenitis were 2.1% each. All cases of surgical infection were treated operatively or otherwise as indicated.

Cancer accounted for eleven cases (1.9%), which were ultimately referred to Oncology Centres. Most of the cases of intestinal obstruction were included within congenital anomalies. Two children with faecal impaction and two cases of adhesive intestinal obstruction (0.7%) were treated conservatively.

### Discussion:

There is growing evidence that childhood surgical conditions are common in developing countries and that poor care results in significant disabilities and deaths<sup>1</sup>. Children develop distinct surgical conditions present unique anaesthetic challenges and have special peri-operative needs<sup>1</sup>. In the last three decades specialized paediatric surgery practice and research has made survival and improved the quality of life to many malformations<sup>2</sup>. Yet, in Sudan such specialized service is not available except in limited centres at or nearby the capital.

The majority of our patients had congenital anomalies (40.2%), injuries (32.3%) and infections (29.9%); all accounting for 97.4% of surgical admissions. In a similar study from Tanzania childhood injuries were 46%, congenital anomalies were 26% and surgical infections were 25%; the three conditions accounting for 97% of all paediatric surgical admissions<sup>3</sup>. In a sub-urban tertiary hospital in Nigeria the three conditions accounted for 87.2% of surgical admissions<sup>4</sup>, compared to

85% in another West African community<sup>5</sup>. However, the cases described were the emergency problems that drew the attention of parents and do not reflect the whole spectrum of the entire situation. It is interesting to note in the various studies cancer was reported to range from 0.7 to 2%<sup>1, 3, 4</sup>.

In this study neonates and infants were 1/5<sup>th</sup> of surgical admissions (19.5%). That contributed to the high incidence of congenital anomalies (40.2%), of which Hirschsprung's disease, gut atresia, ano-rectal malformations and neural tubal defects (NTDs) were the most common. Most of the cases were either born on site, easily recognized or survived delay presentations<sup>6</sup>. Elsheikh and Ibrahim reported that the incidence of NTDs is the highest in Africa at Omdurman Maternity Hospital, probably due to maternal foliate deficiency on conception<sup>7</sup>. Various studies advocating the supplementation of foliate for women at child bearing age before conception to decrease its incidence were described in developing countries including Nigeria<sup>8</sup>, Jordan<sup>9</sup>, Saudi Arabia<sup>10</sup> and Iran<sup>11</sup>. Neonates require the highest level of surgical care, the quality of which is a measure of the quality of paediatric surgical service provided by any centre<sup>12</sup>. However, the effectiveness of the entire health care chain is mandatory for such achievability<sup>13</sup>.

Cases with uro-genital anomalies were mainly pre-school and school boys with undescended testes discovered by parents or presenting with complications like associated obstructed hernia or torsion. Those children were delivered by midwives at home and apparently they did not look for that anomaly at birth or perhaps some may had no knowledge about the condition at all. Similar observations in African communities were reported before<sup>14</sup>. Hypospadias (three cases) and ectopia vesica (one case) were rare presentations at school age, and were referred to paediatric urologists.

Trauma accounted for one third of the childhood surgical admissions. Limb fractures

were almost 40% of injuries due to domestic falls, whereas burns were 1/5<sup>th</sup> of cases and the majority of burns were scalds affecting toddlers while mothers were busy in another household activity. Head injuries were due to falls and road traffic accidents to pedestrians. Together limb fractures, burns, head injuries and soft tissue injuries accounted for 93.5% of the trauma case admissions, in comparison to 85% reported from Gambia<sup>15</sup>. In Iran half of the childhood injuries were due to falls, followed by road traffic accidents<sup>16</sup>. In Ghana the commonest childhood accidents were due to pedestrian injuries and falls<sup>17</sup>. Boys were more commonly injured than girls due to their participation in high-risk activities without parent's supervision. Some falls from animals and trees may indicate clues to the under reported child abuse in this community. Even treatable injuries may result in life-long disabilities, that injury prevention remains the most cost-effective method of addressing the problem of childhood trauma. Snake bites accounted for 6.5% of injuries, usually nomads and villagers but all the patients received ended at favorable outcomes.

Major causes of surgical infection were acute appendicitis and its complications in 53.8% of cases, seen at the age of school children usually in late presentations and often misdiagnosed at primary health care settings<sup>18</sup>. Soft tissue cellulites and abscesses were found in 23.1% of cases highly responsive to treatment, where as bone and joint infections were seen in 18.9% of cases. Similar pattern of childhood surgical infections in children was reported before<sup>5</sup>.

As hospital admission data can be a reasonable tool for assessing the epidemiology of disease within populations, the results of this study provide valuable insight into the surgical conditions that affect children in this community. Such information is necessary for assessing the burden of paediatric surgical diseases on the health system, the impact of surgical conditions on child health and for setting priorities to improve paediatric surgical care. Progress can

only occur if improving poor surgical care is recognized as a significant public health problem and considered as an essential component of child health programs<sup>19</sup>. Paediatric surgery should be a child-centered service, has child-friendly facilities with neonatal intensive care units and paediatric anaesthetic support<sup>20</sup>. The challenge remains in delivering effective paediatric surgical services in spite of the constraints on resources, and that service should facilitate teaching, training and relevant research. We hope that the recognition for establishment of a paediatric surgical unit in our hospital should draw the attention of local and federal health planners. It is not too expensive and not non-essential service<sup>21</sup>.

In conclusion; congenital anomalies, childhood injuries and surgical infections are the common causes of paediatric surgical admissions at a general surgical unit in El Obeid, Western Sudan. Many of these problems are preventable if appropriate community measures are actively considered. There is a need for specialized paediatric surgery unit in the context of a children hospital, attached to or nearby the women hospital.

## References:

1. Bickler SW, Rode H. Surgical services for children in developing countries. *Bull World Health Organ.* 2002; 80 (10): 829-825.
2. Ameh EA, Dauda MM, Nmadu PT. Paediatric surgical research and publications in a developing country setting. *Afr J Paediatr Surg.* 2008; 5(1): 3-7.
3. Mhando S, Young B, Lakhoo K. The scope of emergency paediatric surgery in Tanzania. *Pediatr Surg Int.* 2008; 24: 219-222.
4. Thanni LO, Shonubi AM, Akiode O. A retrospective of paediatric surgical admission in a sub-urban tertiary hospital. *West Afr J Med.* 2005; 24(1): 10-12.
5. Bickler SW, Sanno-Duanda B. Epidemiology of paediatric surgical admissions to a government referral hospital in Gambia. *Bull World Health Organ.* 2000. 78(11): 1330-1336.
6. Nandi B, Mungongo C, Lakhoo K. A comparison of neonatal surgical admissions between two linked surgical departments in Africa and Europe. *Pediatr Surg Int.* 2008; 24: 939-942.
7. Elsheikh GEA, Ibrahim SA. Neural Tube Defects in Omdurman Maternity Hospital, Sudan. *Khartoum Med J.* 2009; 2 (2): 185-190.
8. Uba AF, Isamade ES, Chirdan LB, Edino ST, Igun GO. Epidemiology of Neural Tube Defects in North Central Nigeria. *Afr J Paediatr Surg* 2004; 1(1): 16-19.
9. Aqrabawi E. Incidence of neural tube defects among neonates at King Hussein Medical Centre, Jordan. *Eastern Medit Health J.* 2005; 11(4): 819-823.
10. Majeed-Saidan MA. Neural Tube Defect and folic acid. *Saudi Med J.* 1994; 15(3): 204-206.
11. Golalipour MJ, Mobasheri E, Vakili MA, Keshtkar AA. Epidemiology of neural tube defects in northern Iran. *Eastern Medit Health J.* 2007; 13(3): 560-566.
12. Ameh EA. Challenges of Neonatal Surgery in Sub-Saharan Africa. *Afr J Paediatr Surg.* 2004; 1(1): 43-48.
13. Hadley GP. (Editorial). Perspectives on congenital abnormalities in the third world. *Afr J Paediatr Surg.* 2008; 5(2): 1-2.
14. David OO, Leykoretin E. Undescended testis in a developing country: A study of the management of 71 patients. *Afr J Paediatr Surg.* 2008; 5(1): 11-14.
15. Shen C, Sanno-Duanda B, Bickler SW. Pediatric trauma at a government referral hospital in the Gambia. *West Afr J Med.* 2003; 22(4): 287-290.
16. Karbakhsh M, Zargar M, Zarei MR, Khaji A. Childhood injuries in Tehran. *Turkish J Pediat.* 2008; 50: 317-325.
17. Abantanga FA, Mock CN. Childhood injuries in an urban area of Ghana: a hospital-based study of 677 cases. *Pediatr Surg Int.* 1998; 13: 515-518.
18. Doumi EA, Abdelrahman IH. Acute Appendicitis: Still a Missed Diagnosis in El Obeid, Western Sudan. *Sudan JMS.* 2007; 2(1): 7- 8.
19. Bickler SW, Telfer ML, Sanno-Duanda B. Need for paediatric surgery care in an urban area of Gambia. *Trop Doct.* 2003; 33(2): 91-94.
20. Madu PTN. Paediatric surgery in Nigeria: Past, present and future. *Afr J Paediat Surg.* 2009; 6 (2): 137-142. DOI: 10.4103/0189-6725.54787.
21. Mhando S, Lyamuya K, Lakhoo K. Challenges in developing paediatric surgery in Sub-Saharan Africa. *Pediatr Surg Int.* 2006; 22: 425-427.