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Abdominal masses in children: A 10-Year Review

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Abstract

Background: Some childhood diseases present with abdominal masses alone or with other constitutional symptoms. The knowledge of the common causes of abdominal masses in children can assist in developing a protocol of management by clinicians.

Objective: To describe the aetiology and presentation of abdominal masses in children.

Methods: The hospital records of all cases of intra-abdominal masses in children managed between May 1998 and April 2008 were retrieved for analysis. Socio-demographic and clinical data were obtained and analysed using simple descriptive statistics.

Results: A total of 93 children were included while those without clinical, radiological and intra-operative evidence of intra-abdominal masses were excluded from the study. There were 49 males (52.7%) and 44 (47.3%) females with male-to-female ratio of 1.1:1. The children were aged 1 day to 14 years; 15 (16.1%) were aged <3 years while 23 (24.7%), 27 (29%) and 14 (15.1%) each were aged 3-6 years, >6-9 years, >9-12 years and >12-14 years. The most common cause of abdominal masses was appendiceal mass/abscess in 29%, followed by hydronephrosis in 22.6% and nephroblastoma in 16.11%. The most common symptoms included abdominal pain (86.0%), fever (46.2%), vomiting (40.9%) and abdominal distension (32.2%). The mortality rate was 13%.

Conclusion: Non-malignant conditions were mostly responsible for abdominal masses in children while abdominal pain, fever and vomiting were the leading presentations of abdominal masses in children.

Key words: *Abdominal masses, Appendiceal mass, Children, Malignancy.*

Introduction

Abdominal masses are palpable masses that are located anterior to the paraspinous muscles anywhere within the intra-abdominal cavity. [1] The true incidence of abdominal masses is unknown and there is paucity of information from the literature regarding the relative frequency with which specific diseases present with abdominal masses. In the light of the large number of conditions that can give rise to an abdominal mass, the task of arriving at a specific diagnosis could be difficult. [2]

The discovery of an abdominal mass in a child is a cause for clinical concern because of the possibility of an underlying malignancy. [3] In addition, even non-malignant conditions can pose serious problems when adjacent structures such as nerves, blood vessels and loops of bowels are compressed by the growing masses.

The scope of the evaluation of a child with an abdominal mass involves a myriad of clinical assessments. The diagnostic possibilities considered depend, to some extent, on the age, gender, geographical location of the patient, location of the mass, and the presence or absence of associated symptoms. The determination of the organ or tissue of origin of the mass can narrow down the diagnostic possibilities considerably. [4] Abdominal masses represent a common mode of presentation of both intra-abdominal and extra-abdominal disorders in children but the management could be hindered by diagnostic

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challenges caused by the obscurity of the aetiologies. Identifying the specific aetiology and the clinical presentation of abdominal masses in our environment would facilitate appropriate management of children with abdominal masses.

Therefore, this study aimed to describe the aetiologies and clinical presentations of abdominal masses among children in a tertiary health institution in Sagamu, a semi-urban city, located in south-west Nigeria.

Methods

This is a 10-year retrospective study of children managed for abdominal masses between May 1998 and April 2008 at the Olabisi Onabanjo University Teaching Hospital, Sagamu, Ogun State.

Inclusion Criteria: Only children aged 1 day to 14 years at the last birthday, patients with clinical, radiological or intra-operative evidences of intra-abdominal masses were included in the study.

The hospital records of children who were diagnosed with intra-abdominal masses were retrieved from the Health Information Management department of the hospital for analysis. The clinical diagnoses were reached through a detailed analysis of the clinical history, physical examination and laboratory investigations which included full blood count, electrolytes, urea and creatinine, urinalysis and radiological investigations such as plain abdominal X-Ray, abdominal ultrasonogahpy, intravenous urogram, barium meal and barium enema.

Other relevant information retrieved from the case records included demographic data, duration of symptoms (in weeks) prior to presentation, site of mass, presence of constitutional symptoms and information obtained at surgery. The data generated were analyzed and the findings are presented in proportions, percentages and with relevant graphical illustrations.

Results

One hundred and seventy-eight children with abdominal masses were managed during the study period. However, 126 hospital records were retrieved for data collection. Out of 126, 93 patients met the inclusion criteria. The distribution according to age showed modal representation at the age >6 – 9 years and declined thereafter as shown in Figure 1. There were 49 (52.7%) males and 44 (47.3%) females with a male-to-female ratio of 1.1:1.

Aetiologies and clinical presentations

The causes of abdominal masses included appendiceal mass/abscess 27 (27; 29%), hydronephrosis (21; 22.6%), nephroblastoma (15; 16.1%), intussusception (9; 9.7%), distended bladder (7; 7.5%), ovarian cyst (4; 4.3%), retroperitoneal haematoma (secondary to blunt abdominal injury) (3; 3.2%), faecal mass (3; 3.2%), neuroblastoma (2; 2.2%) and mesenteric cyst (2; 2.2%). Abdominal masses of urinary tract origin were recorded among 43 (46.2%) children (Figure 2). The masses were non-malignant in 76 (81.7%) cases while they were malignant in 17 (18.3%) cases.

The clinical features included abdominal pain (80; 86%), fever (43; 46.2%), vomiting (38; 40.9%), abdominal distension (30; 32.2%), cough (15; 16.1%), difficulty in breathing (12; 13%), dysuria (10; 10.8%) and haematuria (10; 10.8%).

Outcome of care

The modalities of management were based on the pattern of aetiologies as well as the clinical presentations. Twelve (12.5%) patients died among whom were 5 (41.6%) with nephroblastoma, 3 (25.0%) with appendiceal abscess, 2 (16.7%) with intussusception and 2 (16.7%) with neuroblastoma.

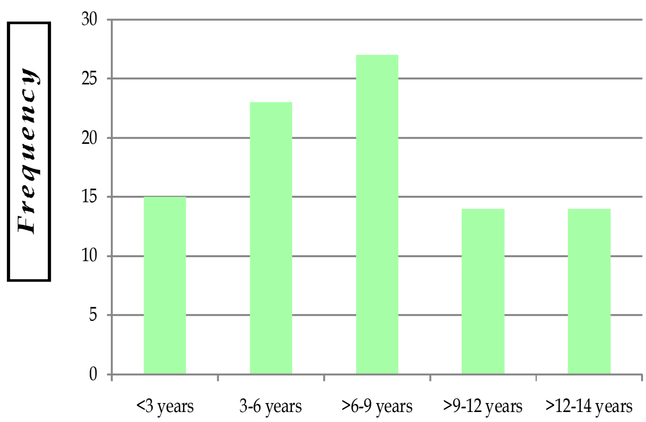

Figure 1 Age distribution of 93 children with abdominal masses

Discussion

A variety of malignant and non-malignant conditions are classified as abdominal masses. Their common attribute in most cases, is the lack of specific clinical features which may help with early diagnosis. In our study, most of the abdominal masses occurred in children aged 3 to 8 years but studies from other centres showed that abdominal masses occurred more frequently among neonates and infants. [5-7]

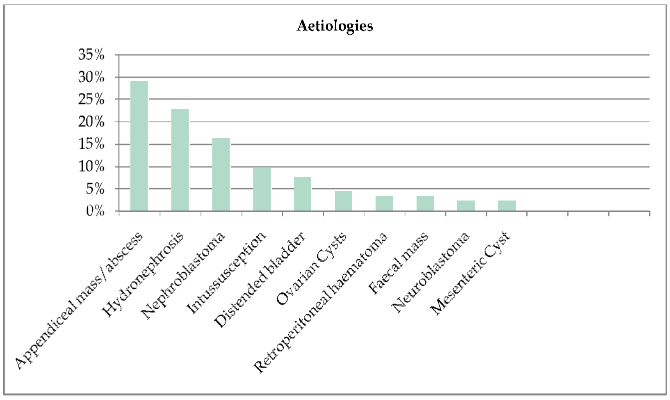

Figure 2- Aetiologies of abdominal masses in children

The difference in age incidence may be explained by differences in the time of presentation in the hospital. While abdominal masses are more likely to be identified much earlier in life in the developed world, most of the cases tend to present in the developing world late when the abdominal masses are already symptomatic and advanced. [8] The males were more frequently affected than females in the present study. This pattern was similar to the report of other researchers. [4,9] However, Cano and Ruiz reported a female preponderance in their study. [10]

Some authors had reported malignant conditions accounting for about 40% of paediatric abdominal masses [3] whereas non-malignant lesions accounted for the majority (81.7%) of the cases reported in the present study. In a related study, Nam and his colleagues reported the preponderance of non-malignant conditions as the causes of abdominal masses. [11] On the other hand, Osifo and co-workers [8] and Nwako [12] in separate studies reported Wilm's tumor (Nephroblastoma) and Tropical Splenomegaly Syndrome as the dominant causes of abdominal masses in children in their respective centres in Nigeria.

Among the Caucasians, neuroblastoma and nephroblastoma have been reported to be the most common malignant paediatric abdominal masses in most of the reports. [3,9,10] In the present study, appendiceal mass/abscess accounted for the majority of disease conditions presenting with abdominal masses in children. The presentation of acute appendicitis with abdominal mass or abscess had also been previously reported by other authors. [13,14] Masses of renal origin accounted for 46.2% of all the masses reported in the present study. This appreciable contribution of the renal system to abdominal masses in children has also been observed by other researchers. [2, 9]

Although some abdominal masses may be incidental findings in otherwise healthy children, many abdominal masses may be associated with symptoms such as vomiting, jaundice, pain, fever or those suggestive of bowel or genitourinary obstructions. The latter serve as important clinical pointers to possible clinical diagnosis. The clinical features associated with abdominal masses in the present study included abdominal pain (86.0%), fever (46.2%), vomiting, abdominal distension, cough, difficulty in breathing, dysuria and haematuria depending on the site, origin and characteristics of the masses. This pattern of features is similar to the findings of other workers. [8, 15]

The spectrum of ancillary investigations deployed for diagnostic purposes in the present study (including full blood count with differential leucocytes count, serum electrolytes, blood urea and creatinine and urinalysis, plain abdominal x-ray, abdominal ultrasonography, intravenous urogram and barium studies) was similar to diagnostic modalities used in other centres. [16,17] Abdominal ultrasonography in particular is a non-invasive imaging modality that aids in diagnosis without the potentially damaging effects of ionizing radiation and has proved very useful and reliable in the diagnosis of paediatric abdominal masses. [18, 19] Computed tomography scan and magnetic resonance imaging are, perhaps, more relevant because of their use in further characterization and staging of malignant paediatric abdominal masses.[20] The patients were managed as indicated and the treatment offered included initial resuscitation, exploratory laparotomy and excisional or incisional biopsy as required, chemotherapy and radiotherapy, when indicated. The mortality observed in our study was 13.0%.

Conclusion

Understanding the common aetiologies and the mode of presentation of paediatric abdominal masses in our environment would enhance early diagnosis, prompt treatment and good outcome. The majority of paediatric abdominal masses in Sagamu were non-malignant conditions.

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