Paediatric Abdominal Tumors at Khartoum Teaching Hospital; Pattern and Clinical Profiles

Mr. Amir Abdalla Mohammadin[1]

Omer E. M. Khair[2],

Dr. Hassan. I. A[3].

1. Associate professor, Faculty of Medicine, Alneelain University, *amohammadain@neelain.edu.sd*
2. Professor of Paediatrics Surgery. ELribat University Hospital
3. General Surgeon, Alginaina Hospital

Abstract:

Objectives: The aim of this study was to determine the mode of presentations, clinical profile and the sensitivity of imaging in the abdominal tumors in paediatric and types of tumors.

Methods: This was a prospective and retrospective cross sectional study conducted in Khartoum Teaching Hospital in the period between April 2012 to April 2014. Variables studied included clinical presentations, imaging used for work up, types of abdominal tumors with regional distributions, and duration of symptoms.

Results: fifty-eight patients enrolled, males, 55.2 % (n=32), and females, 44.8 %(n=26), ages group range between (28 days-13 years) with mean 4.6 years. 51.7% from the center of Sudan, 27.6% from West, 15.5% from Gezira, and 5.2% from North. Most of them presented with abdominal mass and pain 89.7 %(n=52), fever 74.1% (n=43), anemia 77.6 %(n=45), four (6.9%) of them presented as acute abdomen (intussusceptions), two presented with mass and jaundice. Six presented with urine retention (10.3%). The duration of symptoms (15days - 3 months). The imaging used were, US&CT scan with sensitivity, 67.3% & 80.3%, respectively. Histologically: 91.1% malignant tumors, the rest were benign and two cases; (abdominal TB). Wilm's tumor 31%(n=18), lymphoma 27.6%(n=16), neuroblastoma 12.1%(n=7),Hepatoblastoma & teratoma 6.9%(n=4) for each, neuroectodermal 3.4%(n=2), adinocarcinoma, fibro sarcoma, rhabdomy-osarcoma and peutz-jegher 1.7%(n=1) for each. Two cases 3.4% were abdominal TB. about nineteen patients (32.8%) died shortly after starting workup (late presentation).

Conclusion: Abdominal mass in paediatric is serious conditions. Good evaluation, awareness with symptoms and signs with reliable imaging and histological investigations; are a corner stone for the early diagnosis and improvement of outcome.

***Key words*:** *Solid abdominal mass, Wilm's tumor, Neuroblastoma, Lymphoma*

Introduction:

An abdominal mass in a neonate, young child, or adolescent patients is something that every pediatrician needs to be wary of as these masses can indicate malignancy. General presentation varies depending on the underlying pathology of the abdominal mass[1].

The care of children with malignant solid tumors in sub-Saharan Africa is compromised by resource deficiencies that range from inadequate healthcare budgets and a paucity of appropriately trained personnel, to scarce laboratory facilities and inconsistent drug supplies. Patients face difficulties accessing healthcare, affording investigational and treatment protocols, and attending follow-up[2,3]. Children routinely present with advanced local and metastatic disease and many children cannot be offered any effective treatment[2,3].

In April 2000, physicians from France (led by Jean Lemerle) and Africa decided to work together in a joint effort to develop an infrastructure for paediatric cancer care in Africa[2,3].

A palpable mass in the abdomen of a child is a serious finding.

Golden CB and Feusner JH, found the most common abdominal malignancies diagnosed in the paediatric population include; neuroblastoma, Wilm's tumor, and hepatoblastoma, lymphoma, and germ cell tumors[4,5].

A five-years study by Hanif G reviewed the histopathological and demographic data of 264 intra-abdominal tumors in children under 16 years of age. He found Neuroblastoma was the most common tumor constituting 26.6% of all cases, followed by Wilm's tumor (25.1%). Others were Non-Hodgkin's lymphomas (15.5%), germ cell tumors and hepatoblastoma (9%) each, rhabdomyo-sarcoma (4.4%), hepatocellular carcinoma (1.4%), and miscellaneous (6%). Majority of the patients (77.2%) were under 5 years of age. The male to female ratio was 1.1:0.9[5,6].

In Sudan, the most available investigations are blood tests, ultrasound, CT scan and MRI. However, the definitive method is Tru-cut biopsy which safely provides an adequate specimen for pathologic review[7].

Methods:

This is a prospective, cross-sectional, hospital-based study conducted at Khartoum Teaching Hospital in the period " between" April 2012 to April 2014. The study recruited 56 children aged ≤ 14 years diagnosed with abdominal tumor. A predesigned questionnaire was used for data collection trough direct interview after obtaining permission from parents, the variables studied includes the personal data, mode of presentation, constitutional symptoms, duration of symptoms, family history, date of presentation, and regional distribution, part of abdomen involved (bowel, solid organs, others), imaging used for workup (US, CT, MRI) and types of histology performed (excision, incision, tru-cut) for confirmation of diagnosis and final diagnosis (types of tumors) and treatment received. Data were analyzed using computer program; the Statistical Package for Social Sciences System (SPSS). Chi-square test was used for corss-tabulation as well as the significant association was calculated at P-value <0.05.

Results:

Fifty-eight patients were enrolled in this study. Of the total number, 32 were male (55.2%) and 26 female (44.8%). Their ages range between (28 days to 13 years), mean ages were 4.6 years (std ± 3.4).

Regarding geographical distributions, thirty (51.7%) patients from the central part of the Sudan, sixteen (27.6%) from the West, nine (15.5%) from Gezira, three cases (5.2%) from the Northern part of Sudan, and no cases in this study group from the East.

The common presenting symptoms that include the following: Twenty patients (34.5%) presented with abdominal mass, thirty-two(55.2%) presented with abdominal mass and pain together,(so 89.7% presented with abdominal mass). four of patients(6.9%) presented as acute abdomen(an intussusceptions), two (3.4%)patient came with abdominal mass and jaundice, one(1.7%), (Table: 1). Other symptoms that associated with mass were urinary symptoms, in which six patients (10.3%) had episodes of urine retention. There are some constitutional symptoms such as fever, which found in forty-three (74.1%) of patients (Table: 1). The duration of symptoms range between 15 days to 3 months, mean 1.7 months, and (std± 0.73).

During clinical assessment, fifty-two (89.7%) had obvious abdominal masses. two with jaundice, Regarding blood investigation, forty-five of them (77.6%) were presented with anemia(Table:1) and received blood transfusions.

Concerning imaging investigation, forty-six (79.3%) of them under went abdominal ultra sound scanning (US), with sensitivity (67.4%), sensitive in (31) patients. And CT scan was done for Forty-seven (81%), with sensitivity (80.6%), sensitive in (38) patients, and only two patients (3.4%) had MRI, which sensitive in both cases.

Histological diagnosis was done for all patients, these include (incision, tru-cut, and excitional biopsy).

The final results of histological diagnoses were as following: malignancies (91.1%), the rest were benign and two cases; abdominal TB.

Concerning the types of tumors; eighteen patients (31%) were Wilm's tumor(Wt), sixteen (27.6%) lymphoma, seven(12.1%) neuroblastoma (NB), four(6.9%) hepatoblastoma(HB), four(6.9%) teratoma, two cases(3.4%) neuro-ectodermal tumors, others rare cases were adinocarcinoma of the small bowel, fibro-sarcoma, Rhabdomyosarcoma, and peutz-jegher syndrome, one case for each(1.7%). Two cases (3.4%) were diagnosed finally as abdominal tuberculosis (TB) (table 2).

Thirty-nine of them (67.2%) underwent surgery, and nineteen (32.8%) not. These were died during the workup and some just started neoadjuvant treatment (late presentation).

Table 1: Common symptoms and signs

Symptom	No (%)	Fever		Anemia		Urine retention	
		Yes	No	Yes	No	Yes	No
Abdominal mass	20 (34.5%)	11	9	11	9	4	16
Mass & pain	32 (55.2%)	27	5	32	0	2	30
Acute abdomen	4 (6.9%)	4	0	0	4	0	4
Mass & jaundice	2 (3.4%)	1	1	2	0	0	2
Total	58 (100%)	43	15	45	13	6	52

Table 2: Tumor distribution between genders and age groups:

Tumor	Number		Age(Years)		Total
	Male	Female	<5	> 5	
Wilm's tumor	8	10	13	5	18
Lymphoma	11	5	7	9	16
Hepatoblastoma	2	2	4	0	4
Neuroblastoma	6	1	5	2	7
Teratoma	1	3	3	1	4
Adenocarcinoma	1	0.0	0	1	1
Ptz	1	0.0	0	1	1
Ganglioneuroma	0.0	1	1	0	1
Neuroectodermal	0.0	2	2	0	2
Fibrosarcoma	0.0	1	0	1	1
Rabdomyosarcoma	1	0.0	1	0	1
Abdominal TB	1	1	0	2	2
Total	32	26	36	22	58
Percentage	55.2%	44.8%	62.1%	37.9%	100%

Discussion:

In this study fifty-eight (58) patients were included, majority of patients were in the age of 2-3 years, with of age.

Findings of the study revealed predomination of abdominal mass which reported in vast majority of patients (89.7%). However, most patients with abdominal mass complained of pain (55.2% 58) and less frequently there were cases of abdominal mass alone (34.5% out of 58). There are some constitutional symptoms such as fever which reported in most patients (74.1%), and loss of appetite.

These symptoms indicate the effect of complication, as some of patients presented late and this is similar to the study which reported that, the care of children with malignant solid tumors in sub-Saharan Africa is compromised by resource deficiencies that range from inadequate healthcare budgets and a paucity of appropriately trained personnel[4,5], also literature reviewed that, mostly presentation varies depending on the underlying pathology of the abdominal mass.

The studies of Malogolowkin and McKenna considered abdominal mass is one of the most common presenting signs of malignant solid tumors in children and should be noticed specially by family members[8,9]. Predomination of asymptomatic abdominal mass also reported by McHugh K in UK[10].

The reasons for delayed presentation in our study, were attributed to predomination of reporting painless abdominal mass, most of the patients came from remote areas where there

is scarcity of investigative facilities and absence of tertiary hospitals, some are immigrants reside in peripheries of Khartoum in addition to poor awareness towards health care among nearly all the mothers. Most of the abdominal masses in children (mainly Wilm's tumor) are detected by mothers during bathing their babies.

Late presentation has been indicated by a very frequent anemia which observed in most children (77.6%) all of them received blood. Ultrasound sensitivity was not satisfying as reported earlier in 1990-1998 by Bushra M M (67.3% vs. 92.3% respectively)[10]. On the other hand, the same study reported that, the sensitivity of CT scan in diagnosing abdominal masses in infants and children was (80.3%)[10].

As confirmatory method, biopsy revealed malignant tumour in vast majority of children (91.1) and few cases of benign condition (e.g. tuberculosis).

Among case of malignant tumour, nephroblastoma was the predominant, followed by lymphoma and neuroblastoma (31%,27.6% and 12.1% respectively). In comparison with an eight years study in Sudan; the number of tumor now increased with predomination of Wilm's tumor, instead of lymphoma as reported previously in the study of Abuidris DO, et al [11].

Our findings also similar to that done by Rai AT and Moazam F. of 53 patients between the ages of 1 and 18 years, with malignant abdominal tumors seen between 1987 and 1993 were reviewed. Wilm's tumor was the most common tumor constituting 28.3% of all cases. The others included Non-Hodgkin's lymphomas (20.8%) and neuroblastomas (11.3%)[12].

Recommendations

Since paediatric abdominal tumours are increasing recently, we recommend the following:

- Improvement of heath education for mothers to be aware about early symptoms and signs of abdominal mass.
- Health personnel must be aware to examine the abdomen carefully for any reason in order not to miss abnormalities.
- Protocol and guideline for abdominal tumours management in children should be adopted, and multidisciplinary team should be established. Including; paediatric surgeons, radiologist, pathologist and oncologist .
- including cell type, degree of differentiation, histochimisteryand tumour marckers are appropriate for better management and outcome.

- Finally, tumour registry should be resumed, for documentation and evaluation to know the outcome and the epidemiology of tumours to define accusative factors,

References:

1. Riad M, Rahhal, Ahmad CE, et al. A Child with an Abdominal Mass. *Pediatric Rounds* 2006; 37– 42.
2. Hadley LG , Rouma BS, Saad-Eldin Y. Challenge of pediatric oncology in Africa. *Semin Pediatr Surg* 2012; 21(2):136-141.
3. Mohamed H A, Fousseyni B, Hussein CL. Challenges for paediatric oncology in Africa. *The Lancet Oncology* 2013; 14(4): 279 – 281.
4. Golden CB, Feusner JH. Malignant abdominal masses in children: Quick guide to evaluation and diagnosis. *PediatrClin North Am* 2002; 49(6):1369-92.
5. Hanif G. Intra-abdominal tumors in children. *J Coll Physicians Surg Pak* 2004; 14(8):478-480.
6. Armand E, Brodeur, Garrett M, et al. Abdominal Masses in Children: Neuroblastoma, Wilms tumor, and others. *Pediatr Rev* 1991; 12:196-206.
7. Cost NG, Granberg CF, Schlomer BJ, et al. Tru-Cut renal mass biopsy for diagnosing Wilms tumor. *Urol J* 2013; 10(1):780-783.
8. Malogolowkin, MH, Quinn, JJ, Steuber, CP, et, al. Clinical assessment and differential diagnosis of the child with suspected cancer. In: Principles and Practice of Pediatric Oncology, 5th, Pizzo, P, Poplack, DG (Eds), Lippincott Williams & Wilkins, Philadelphia 2006. p.145.
9. McKenna RJ, Schwinn CP, Soong KY, Higinbotham NL. Sarcoma of the osteogenic series (osteosarcoma, fibrosarcoma, chondrosarcoma, parosteal osteogenic sarcoma and sarcomata arising in abnormal bones). *J Bone Joint Surg* 1966; 48A:1.
10. McHugh K. Renal and adrenal tumors in children. Cancer Imaging. 2007; 7(1): 41–51.
11. Abuidris DO, Elimam ME, Nugud FM, Elgaili EM, Ahmed ME, Arora RS. Wilms tumor in Sudan. *Pediatr Blood Cancer*. 2008 Jun;50(6):1135-7. doi: 10.1002/pbc.21547.
12. Rai AT, Moazam F. Malignant abdominal tumors in children. *JPMA.* 1996;8:168–171.