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HISTOPATHOLOGICAL SPECTRUM OF PAEDIATRIC RENAL TUMORS: A 10 YEAR STUDY.

Pathology

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ABSTRACT

The primary kidney tumours represented approximately 7% of all paediatric malignancies. Nearly 90% of them are Wilms tumors (WT). Most renal tumours present with non-specific features of an abdominal mass, usually detected incidentally by parents or care takers. This was a hospital based 10 year study to analyse the histological spectrum of paediatric renal tumors. Of 184 patients 38 (20.6%) patients belonged to paediatric age group. Histopathologically the patients were diagnosed as WT (n=29; 76.4%), and non-WT (n=9; 23.6%). The most frequently observed symptoms were abdominal mass followed by pain and hematuria.

KEYWORDS

Wilms tumor, CMN, SIOP, NWTSG.

INTRODUCTION:

The primary kidney tumours represented approximately 7% of all paediatric malignancies in the age group up to 15 years and 4.4% of all cancers in children and adults under the age of 20 years [1]. Nearly 90% of them are Wilms tumors (WT)[2], followed by renal cell carcinoma (3-5%), mesoblastic nephroma (3%), renal clear cell sarcoma, rhabdoid renal tumour (2%) and rarely mixed genesis tumours (2%) [3]. Most renal tumours present with non-specific features of an abdominal mass, usually detected incidentally by parents or care takers, although other symptoms and signs may occur, including abdominal pain, haematuria and hypertension [4]. Increased interest is paid to accurate histological diagnosis and tumour stage detection of paediatric kidney tumours, because the treatment and prognosis of patients significantly differ depending on the morphological type of tumour diagnosed. A detailed and meticulous histopathologic examination of tumour nephrectomy specimens is essential to establish histologic type and to record accepted histopathological prognostic determinants i.e. tumour size, histologic subtype, nuclear grade, and stage in cases of malignant renal neoplasms [5]. Globally their research is carried out within the framework of large research groups, the most significant of which are the National Wilms Tumour Study Group / NWTSG in the USA and International Society of Paediatric Oncology / SIOP Study Group in Europe [6].

MATERIAL AND METHODS:

It was a 10 year study conducted in the department of pathology Sher-I-Kashmir Institute of Medical Sciences (SKIMS), Srinagar from June 2002 to May 2012. For this study, the cases of renal tumors were searched from records maintained in the said department. The required clinical details were sought from the medical records department. Corresponding slides were collected and re-evaluated for the confirmation of diagnosis. Paediatric age group was defined as ≤ 18 years of age. The patients with diagnosis based on histopathological analysis of trucut biopsy, nephron-sparing surgery (NSS) or nephrectomy specimens, were included in the study.

Results: The study includes 184 cases of renal tumors reported in the Department of pathology at Sheri-Kashmir Institute of Medical Sciences (SKIMS) Srinagar Kashmir during the 10 year period. Of 184 patients 38 (20.6%) patients belonged to paediatric age group. Histopathologically the patients were diagnosed as WT (n=29; 76.4%), and non-WT (n=9; 23.6%) (Table-1). Cases with bilateral renal tumors were either WT (n=2) or renal angiomyolipoma secondary to tuberousclerosis (n=1). WT and non-WT did not differ as for gender of the patients (p=0.63). Median age of the patients with WT was statistically significantly lower than that of non-WT patients (32.3±18.05 vs. 76.63±64.21 months, p<0.05). The most frequently observed symptoms were abdominal mass followed by pain and hematuria. Tumor was incidentally found in 2 patients (Table-2). Distribution of all patients according to stages were as follows: Stages I (n=10; 26.3%), II (n=15; 39.4%), III (n=9; 23.6%), and IV (n=4; 10.5%). All cases diagnosed as WT were treated according to 2001 SIOP WT protocol, and 26 (68.4%) patients received radiotherapy.

Table- 1: Tumor histopathology

Tumor types	n	%
Wilms tumor	29	76.4%
Congenital mesoblastic nephroma	4	10.6%
Renal cell carcinoma	3	7.8%
Angiomyolipoma	1	2.6%
Clear cell sarcoma	1	2.6%
Total	38	100%

Table-2: Chief presenting complaint

Symptom	n	%
Abdominal mass	25	65.7%
Abdominal pain, hematuria	6	15.7%
Abdominal pain	5	13.2%
Incidental	2	5.3%

DISCUSSION:

Renal tumors constitute a heterogeneous group of neoplasm's distinguishable histologically and cytogenetically. Classification of renal cell carcinoma is important from the treatment and prognosis point of view as well as for understanding of histogenesis. The kidneys are affected by various types of malignant tumours, 99 percent of renal neoplasms are malignant; Wilms tumour[7]. Wilms tumor (fig-1) in other terms, nephroblastoma is the most frequently seen solid renal tumor during childhood [8]. In our study we also found wilms tumor to be the commonest childhood tumor (76.4%) followed by congenital mesoblastic nephroma (10.6%) (fig-2) and renal cell carcinoma (7.8%), which is in accordance with the world literature. About 5-10% of the children with diagnosis of WT synchronous or metachronous bilateral tumors have been observed [9]. In our study, all of bilateral tumors were synchronous tumors with a detection rate of 7.8% which was in accordance with the literature. Unlike adults, the most frequently observed symptoms in paediatric patients are abdominal mass, and swelling, followed by abdominal pain, hematuria, fever, and hypertension [10]. In our study more than half of the cases (65.7%) presented with chief complaint of abdominal mass. World literature demonstrates that majority of the paediatric renal tumors are diagnosed in patients younger than 5 years of age, and most of the cases diagnosed as WT belong to the age range of 3-4 years [11]. In our study WT was diagnosed earlier than non-WTs, mean age of all cases was 32.3±18.05 vs 76.63±64.21 months respectively. Non-WT seen in paediatric patients belongs to a heterogenous group, they have different

malignancy potentials, treatment responses, and mortality rates. In a study conducted by Miniati et al [12], congenital mesoblastic nephroma (CMN) ranked on top among the non-WT group which was in accordance with our study. In USA and Europe different treatment modalities have been used in management of renal tumors of the paediatric age [8]. Despite different treatment protocols, overall survival rates exceed 90%. In Europe preoperative chemotherapy is performed based on SIOP protocol. However in the USA firstly surgery, then chemotherapy are applied according to National Wilms Tumour Study Group/Children's Oncology Group (NWTSG/ COG protocol).

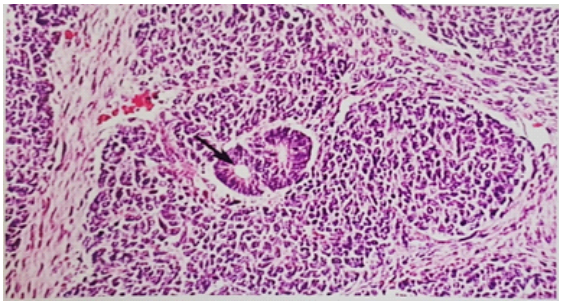

Fig-1: Histology of wilms tumor showing epithelial differentiation in the form of tubule with well defined lumen (arrow).

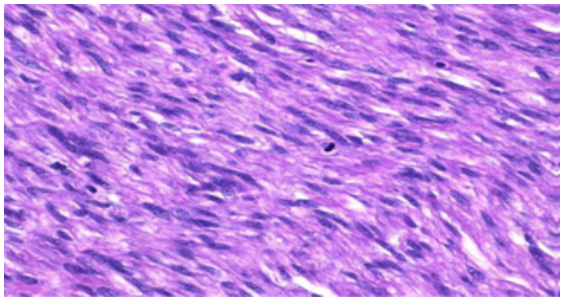

Fig-2: Photomicrograph showing proliferation of spindle cells with acidophilic fibrillary cytoplasm. [Congenital mesoblastic nephroma]

CONCLUSION:

From our study we conclude that WT is the commonest childhood renal tumor. Substantial number of Non- WT cases were also seen among which CMN was commonest followed by Renal cell carcinoma. The commonest presenting symptom was abdominal mass followed by abdominal pain and hematuria.

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