Original Article

Wilms' tumor different histological patterns observed in local children of Pakistan

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Objective: To describe the different histological patterns of Wilm's tumor in local children of Pakistan.

Methodology: Biopsies from fresh nephrectomy specimens and paraffin embedded blocks from different hospitals of Lahore were studied.

Results: Out of 50 patients, 66% were males and 34% were females, with male: female ratio of 2:1. Mean age was 4±2.01 years. The most common clinical presentation was abdominal mass, pain and hematuria. Most common site of tumor was left kidney (68%). No bilateral tumor was found. Most common histological subtype was triphasic (56%) followed by monophasic (only blastemal;38%), biphasic (6%) and teratoid variant of wilm's tumor (2%) cases. 21 cases were limited to stage I (42%), 12 progressing in stage II (24%). However stage III had only 9 (18%) cases and 8 in stage IV (16%). There was no case in stage V.

Conclusion: Wilm's tumor is a common childhood malignancy in Pakistan with most common triphasic histological pattern with predominant blastema component and most frequently patients were limited to stage 1. (Rawal Med J 201;41:197-199).

Key words: Wilm's tumor, Histological subtype, teratoid variant.

INTRODUCTION

Wilms' tumor is the most common intra-abdominal malignancy in childhood and represents approximately 6% of all pediatric cancers, affecting about 1 in 10,000 children.[1] Approximately 75% occur in children who are less than 5 years of age, with a peak incidence at 2-3 years of age.[2] Male to female ratio is 1.4:1.[3] It is a genetically heterogeneous neoplasm and may be inherited or occur sporadically.[4] Genetic studies have identified tumor suppressor genes that are known to play an important role in the normal development of the urogenital tract for example the WT1 gene at the 11p13 locus, and the WT2 gene at the 11p15 locus.[5] Inactivation of these genes appears to be an early genetic event in the development of Wilms' tumor.

The classic clinical presentation of Wilms' tumor is in the form of an abdominal mass felt by the mother when handling the child. Hematuria and pain are rare. Hypertension is also present, but in a minority of the cases and the most common histological subtype is triphasic.[3] The objective of this study was to describe the morphological characters of Wilms' tumor in local children of Pakistan.

METHODOLOGY

It was a descriptive study conducted in the Department of Morbid Anatomy and Histopathology, University of Health Sciences, Lahore. The study was completed in 9 months from November 2014 to July 2015. A total of 50 patients of Wilms' tumor of both gender were included in the study. Patients were examined and clinical data was recorded. Biopsies from fresh nephrectomy specimens and paraffin embedded blocks were collected from different local hospitals of Lahore. Data was analyzed using SPSS version 20.

RESULTS

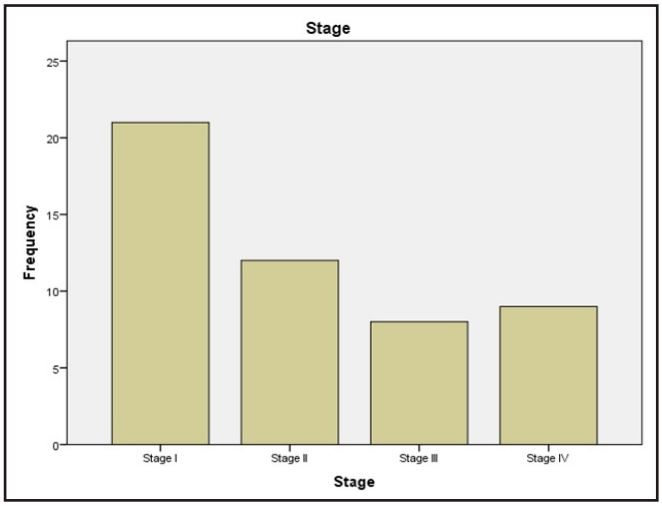
A total of 50 cases of Wilms' tumor were included in the study. Age ranged from 1 year to 10 years (mean 4±2.01). Out of these 50 patients, 33 (66%) were males and 17 (34%) were females. The male to female ratio was 2:1. The most common clinical presentation was abdominal mass and pain in 29 (58%) and hematuria in 18 (36%) cases. All the tumors were unilateral. Among the unilateral tumors, 34 (68%) were from left kidney and 16 (32%) were from right kidney.

Table 1. Microscopic features of Wilm's tumor.

		Microscopic features			Total
		Monophasic	Biphasic	Triphasic	
Gender	Male	16	2	15	33
	female	3	1	13	17
Total		19	3	28	50

Most common histological subtype was triphasic (n=28; 56%) followed by monophasic (only blastemal) in 19 (38%), biphasic in 3 (6%) and teratoid variant of Wilms' tumor in one (2%) case (Table 1). Stage I was limited to 21 cases (42%), 12 progressing in stage II (24%). However, stage III had only 9 (18%) cases and 8 were in stage IV (16%) (Fig.1). There was no case in stage V. Only one case of teratoid variant of Wilms' tumor was seen with triphasic pattern and predominant blastema component. More than 50% of tumor was comprised of malignant cartilage. Blastemal component was predominant in the study, especially in the male patients when compared to females. Out of total 50 cases, 29 (58%) were of intermediate risk and 19 (38%) of high risk, whereas 2 (4%) were of low risk.

Fig. 1. Showing that most of the patients were limited to the stage I.



The tumor necrosis was seen in 18 (36%) cases and necrosis was seen in high risk patients. Feature of anaplasia was seen in 21 (42%) cases. Focal anaplasia in 5 (10%) and diffuse anaplasia in 15 (30%) cases. out of 50, 27 (54%) cases were of favorable histology and 23 (46%) of unfavorable histology.

DISCUSSION

Wilms' tumor is one of the most common malignancy of the childhood.[6] Limited number of data has been published in Pakistan regarding Wilms' tumor or nephroblastoma. In Pakistan, a detailed study on the malignant abdominal tumors in children was carried out at Agha Khan University, Karachi and reported that the most common abdominal malignant tumor in children was Wilms' tumor.[9]

The mean age of patients was 4 years and age range was 2-5 years.[2] Male to female ratio was 2:1. Previous studies also show male predominance in Wilms' tumor.[3] Most common clinical presentation was the abdominal mass in all cases and pain in a few cases. All the tumors in present study were unilateral, no bilateral tumor was found. Most common side of tumor origin was left kidney and findings are in agreement with a previous study.[3] Most common histological subtype in our study was triphasic (56%) with blastema predominance and then monophasic (38%). In monophasic only blastema component was found. A previous study also showed that the most common histological subtype was triphasic.[3]

In the present study, out of 50 cases, 58% were of intermediate risk, 38% of high risk and 4% were of low risk. These findings are similar to a previous study.[7] In our study, most of the patients were found to be limited to stage I (40%). While 24% limited to stage II, 18% to stage III and 16 % limited to stage IV. No case limited to stage V was diagnosed. Stage 1 tumors were encountered most frequently in our study, which is in agreement with Soyemi et al.[3]

The tumor necrosis was seen in 36% cases and necrosis was seen in high risk patients. Presence of feature of anaplasia in Wilms' tumor is associated with poor clinical outcome of the patient.[7] In current study, anaplasia was seen in 42% cases, focal anaplasia in 12% and diffuse anaplasia in 30% cases. out of 50 cases, 27 (54%) cases were of favorable histology and 23 (46%) of unfavorable histology.

Fernandes et al in 1988, described that the teratoid variant of the Wilms' tumor is one of the rare histological variant in which there is heterologous components like glial tissue, bone, cartilage, muscle or adipose tissue are present, that constitute about 50% of the total tumor.[8] In the present study, only

one case of teratoid variant of Wilms' tumor was diagnosed with typical triphasic pattern comprising of epithelial, blastemal and stromal component. Blastemal component was predominant again. 50% tumor was comprised of malignant cartilage and there was diffuse anaplasia.

CONCLUSION

In local children of Pakistan, the most common histological pattern of Wilms' tumor was triphasic with predominant blastema component with or without feature of anaplasia. Most patients were found to be limited to stage 1 and of intermediate risk. Wilms' tumor was found more common between the ages of 1 and 10 years with male predominance. Most common site of tumor origin was left kidney. No case of bilateral Wilms' tumor was seen.

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