ISSN:2161-0681

Journal of Clinical & Experimental Pathology

Available online at: OMICS Publishing Group (www.omicsonline.org)

Digital Object Identifier: http://dx.doi.org/10.4172/2161-0681.1000146

Soyemi et al., J Clin Exp Pathol 2013, 3:3
http://dx.doi.org/10.4172/2161-0681.1000146

Clinical & Experimental Pathology

Research Article Open Access

Morphological Features of Wilms' Tumour in a Tertiary Health Care Institution: Our Findings

Soyemi SS[1]*, Osuoji RI[2], Faduyile FA[1], Sanni DA[1], Oyewole OO[1], Obafunwa JO[1] and Bankole MA[2]

[1]*Department of Pathology and Forensic Medicine, Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria*
[2]*Division of Paediatric Surgery, Department of surgery, Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria*

Abstract

Nephroblastoma or Wilms' tumour is the most common primary renal malignancy of childhood. Despite being a malignant tumour, a survival rate of over 90% is now seen today (compared to 30% in the thirties) and this resulted from the success of collaborative trials and the use of multimodal therapy. Black children have a 2.5 times increased incidence over their white counterparts and the sex ratio is approximately 1.0. It is also associated with a number of recognised syndromes. The most important prognostic indicators for Wilms' tumour are the histological subtype and the stage at presentation. Although, studies have been carried out on this tumour focussing on the clinical aspect, it is worthy of note that very little study has been done on the morphological features of this tumour in this centre and the country at large. The purpose of this study is therefore to look at the morphological patterns of Wilms' tumour seen in this centre and if possible determine whether a relationship exists between the size, position of the tumour and the histological subtype, and finally, if a particular histological subtype is age-related.

Patients and method: This is a retrospective study of the cases of Wilms' tumour seen in the division of paediatric surgery in our tertiary health care institution over a 5-year period i.e. (from Jan 2008 to Dec 2012). The nephrectomy samples of these patients were sent to the department of pathology and forensic medicine in the same institution. During grossing of the samples, adequate attention was paid to any obvious degenerative changes such as haemorrhage and necrosis. Where these changes were seen, they were recorded. The tumour sizes in the largest diameter and weights were also recorded. This was followed by histopathological reports which not only included the diagnosis, but also the histological types. These were all recorded in a pre-designed data form. The age at presentation in months and sex were also recorded in the form. All these were analysed using the statistical package for social science (SPSS) Software version 17.

Results: In this study, 44 patients had Wilms' tumour with males representing 26 (59.1%) while females accounted for 18 (40.9%) and a male to female ratio was 1.4:1. The ages of the patients ranged from 10 months to 8 years with mean age value of 4 ± 2.91. The mode as well as the median age was 3 years. 24 (54.5%) of the tumours were located on the left position while 20 (45.5%) were seen on the right side. Most of the tumours weighed between 501-1000 grams representing (40.9%). In terms of tumour volume, majority measured between 1001-2000 cm^3 accounting for (40.9%). Necrosis was observed in 95.5% of the cases. It is also worthy of note that all the tumours had areas of haemorrhage grossly, and 100% exhibiting triphasic histological pattern. This characterizes the classical WT. Bilateral or Synchronous tumour was not seen in this study.

Conclusion: The predominant histological pattern of Wilms' tumour in this centre is the triphasic pattern representing the classical wilm's tumour. It is most common in children between the ages of 1 and 5 years with average tumour weight of between 501 and 1000 gm. The bilateral (synchronous) or metachronous type of Wilms' tumour was not seen in this study.

Keywords: Wilms; Tumour; Favourable histology; Nephrectomy

Introduction

Nephroblastoma or Wilms' tumour is the most common primary renal malignancy of childhood [1]. This assertion can be corroborated by studies done in the sub-Saharan Africa by Ekense et al. [2,3] which showed that Wilms' tumour is the most common childhood malignancy in Sub-Saharan Africa. Despite being a malignant tumour, a survival rate of over 90% is now seen today (compared to 30% in the thirties) and this is an evidence of the success of collaborative trials and the use of multimodal therapy [4-6]. Generally, childhood renal tumours are largely of embryonic origin, with rapidity of growth and a better response to therapy [1]. Black children have a 2.5 times increased incidence over their white counterparts and the sex ratio is close to 1 [4]. Wilms' tumour is also associated with a number of recognised syndromes including WAGR, Beckwith-Wiedemann and Denys-Drash syndromes [1]. The most important prognostic indicator for Wilms' tumour is the histological subtype where it is known that epithelial predominant WT demonstrate a favourable prognosis. This pattern has been shown to have a low risk of recurrence [6]. A diffuse anaplastic feature signifies a poor prognosis, and such tumours tend to occur in an older subset of children [1]. Although, studies have been carried out on this tumour focusing on the clinical aspect, it is worthy of note, that very little study has been done on the morphological features of this tumour in this centre and the country at large. The purpose of this study is therefore, to look at in totality the morphological patterns of Wilms' tumour seen in this centre.

***Corresponding author:** Soyemi SS, Department of Pathology and Forensic Medicine, Lagos State University Teaching Hospital, Ikeja, Lagos, Nigeria, Tel: +234-8023286720; E-mail: soyemisunday@yahoo.com

Received August 28, 2013; **Accepted** October 14, 2013; **Published** October 17, 2013

Citation: Soyemi SS, Osuoji RI, Faduyile FA, Sanni DA, Oyewole OO, et al. (2013) Morphological Features of Wilms' Tumour in a Tertiary Health Care Institution: Our Findings. J Clin Exp Pathol 3: 146. doi:10.4172/2161-0681.1000146

Patients and Methods

This is a retrospective study of cases of Wilms' tumour seen in the division of paediatric surgery in our tertiary health care institution over a 5-year period i.e. from Jan 2008 to Dec 2012. This department currently has five paediatric surgeons, two of which were among the authors. Prior to embarking on this study, approvals from the department and the hospital (research and ethics committee) were obtained as per protocol.

The Nephrectomy samples of these patients were sent to the department of pathology and forensic medicine in the same institution. During grossing of the samples, adequate attention was paid to any obvious degenerative changes such as necrosis or cystic changes. Where these changes were seen, they were recorded. The tumour sizes in the largest diameter were also recorded. This was followed by histopathological reports which not only included the diagnosis, but also mentioned the histological type and the degree of anaplasia. The type of the tumour whether monophasic, biphasic or triphasic was also noted. These were all recorded in a pre-designed data form. All these were analysed using the statistical package for social science (SPSS) Software version 17.

Results

In this study group 44 patients had Wilm's tumour with males representing 26 (59.1%) while females accounted for 18 (40.9%) and a male to female ratio was 1.4:1. The ages of the patients range from 10 months to 12 years with mean age value of 4 ± 2.91. The mode as well as the median age was 3 years. 32 (72.7%) of the patients were in age group 1-5 years, 8 (18.2%) were in group 6-10 years while 2 (4.1%) were seen in patients below 1 year and above 10 years respectively.

Twenty four (54.5%) of the tumours were located on the left side while 20 (45.5%) were seen on the right side. An amazing observation was that 100% of patients aged between 6 and 10 years had their tumours on the right side (Table 2). Most of the tumours weighed between 501-1000 grams representing (40.9%) while 27.3% of the tumour weighed between 1001-1500 grams (Table 1). In terms of tumour volume, majority fell between 1001-2000 cm^3 accounting for (40.9%). Necrosis was observed in 95.5% of the cases. It is also worthy of note that all the tumours had areas of haemorrhage grossly, with all having favourable histology and 100% exhibiting triphasic pattern. Synchronous tumours were not seen in this study.

Discussion

Wilms' tumours are generally found in children between the ages of 2 and 4 years with median age for males and females of 37 and 43 months respectively [7]. This finding is in total agreement with the result of our work which revealed a median age of 36 months. The rarity of this tumour in neonatal period has also been documented by Hrabovsky et al. [8]. This is further corroborated by this study in which no single case of the tumour in the neonatal period was identified. About two-thirds of the cases under review were seen in 1-5 years age groups. This is also in comparable to previous work [7]. Although, this is not a clinical paper, however, survival statistics, rates of relapse and clinical stages can be seen in a previous retrospective study done in this centre by two of the authors of this manuscript.

We agree that neo-adjuvant chemotherapy may alter histological pattern, our patients did not have neo-adjuvant chemotherapy. All the patients had triphasic histological pattern. This histological type characterizes the Classic WT and none of the tumours showed anaplastic features.

Parameter	Number (%)
Sex	
Male	26 (59.1)
Female	18 (40.9)
Age category	
<1 year	2 (4.1)
1-5 years	32 (72.7)
6-10 years	8 (18.2)
11-15 years	2 (4.5)
Position of tumor	
Left	20 (45.5)
Right	24 (54.5)
Tumour weight (grams)	
<500	4 (9.1)
501-1000	18 (40.9)
1001-1500	12 (27.3)
1501-2000	4 (9.1)
>2000	6 (13.6)
Tumour volume (cm^3)	
<1000	6 (13.6)
1001-2000	18 (40.9)
2001-3000	8 (18.2)
3001-4000	8 (18.2)
4001-5000	2 (4.5)
>5000	2 (4.5)
Necrosis	
Positive	42 (95.5)
Negative	2 (4.5)

Note: All were 100% Hemorrhagic and microscopically triphasic. None of the tumours showed anaplastic feature.

Table 1: Frequencies: Most of the tumours weighed between 501-1000 grams representing (40.9%) while 27.3% of the tumour weighed between 1001-1500 grams.

		Sex	
	% Within sex	**Male**	**Female**
Position of Tumour	Left	12 (46.2%	8 (44.4%)
	Right	14 (53.8%)	10 (55.6%)
	Total	26 (100.0%)	18 (100.0%)
Weight in grams	<500	2 (7.7%)	2 (11.1%)
	>501-1000	8 (30.8%)	10 (55.6%)
	1001-1500	6 (23.1%)	6 (33.3%)
	1501-2000	4 (15.4%)	-
	>2000	6 (23.1%)	-
	Total	26 (100.0%)	18 (100.0%)
Tumour volume (cm^3)	<1000	2 (7.7%)	4 (22.2%)
	1000-2000	12 (46.2%)	6 (33.3%)
	2001-3000	2 (7.7%)	6 (33.3%)
	3001-4000	6 (23.1%)	2 (11.1%)
	4001-5000	2 (7.7%)	-
	>5000	2 (7.7%)	-
	Total	26 (100.0%)	18 (100.0%)

Table 2: Sex versus position, weight and volume of tumour: An amazing observation was that 100% of patients aged between 6 and 10 years had their tumours on the right side.

It is also worthy of note that 96% of the tumour in this study had necrosis. This represented predominance of the low risk group according to the European International Society of Paediatric Oncology (SIOP) [1].

Despite being uncommon in the adolescent age group [9], and

	% Within age category	Age category			
		<1 year	1-5 years	6-10 years	11-15 years
Position of Tumour	Left	-	18 (56.3)	-	2 (100.0)
	Right	2 (100.0)	14 (43.8)	8 (100.0)	-
	Total	2 (100.0)	32 (100.0)	8 (100.0)	2 (100.0)
Weight in grams	<500	-	4 (12.5)	-	-
	>501-1000	2 (100.0)	12 (37.5)	4 (50.0)	-
	1001-1500	-	10 (31.3)	2 (25.0)	-
	1501-2000	-	2 (6.3)	2 (25.5)	
	>2000	-	4 (12.5)	-	2 (100.0)
	Total	2 (100.0)	32 (100.0)	8 (100.0)	2 (100.0)
Tumour volume (cm^3)	<1000	-	4 (12.5)	2 (25.0)	-
	1000-2000	2 (100.0)	16 (50.0)	-	-
	2001-3000	-	4 (12.5)	4 (50.0)	-
	3001-4000	-	6 (18.8)	2 (25.0)	-
	4001-5000	-	2 (6.3)	-	-
	>5000	-	-	-	2 (100.0)
	Total	2 (100.0)	32 (100.0)	8 (100.0)	2 (100.0)

Table 3: Age category versus position, weight and volume of tumour.

adult [10], none was found in the adult age group in our study. Studies have also shown that no appreciable sex predilection [8,11] exists; our work did not also reveal any significant predilection between males and females. However, a remarkable twist occurred in a study done by Osuoji et al. [12] which reported a ratio of 3 to 2 in favour of males.

Although no conclusive study has been done on whether a tumour on one particular side has a prognostic advantage over the other, the predominance of Wilms' tumour on the left in this study cannot be overlooked. A particular observation was seen in patients whose ages ranged from 6-10 years in which 100% of the tumour were located on the right side. The reason for this findings is not known, this might however, be a focus for research in the future.

Our finding of majority of the tumours weighing more than 500 gm has also been well reported by most literatures [13]. This might be a reflection of late presentation of most patients. All the cases under review had triphasic patterns Classic Wilm's tumour without features of anaplasia. This again shows the predominance of this type of tumour in our centre.

Conclusion

The predominant histological pattern of Wilms' tumour in this centre is the triphasic pattern without any tumour showing anaplastic features. It is commonest in children between the ages of 1 and 5 years with average tumour weight of between 501 and 1000 gm (Table 3). The bilateral (synchronous) or metachronous type of Wilms' tumour was not seen. Future studies will include why 100% of children between the ages of 6 and 10 years had the tumour on the right side.

Consent

Consent for the publication of this paper was obtained from the department.

Competing Interests

The authors declare that they have no competing interests.

Acknowledgements

We thank the department and the hospital authority for given us the approval to carry on this study. Special thanks also go to the technologist in the department who assisted in preparing new slides in cases of misplaced or broken ones.

References

1. Lazarus J, Kaestner L (2010) Wilms' tumour-an update. Journal of Paediatric Sciences 2: e26
2. Ekense SO, Heij HA, Youngson GG (2011) Paediatrics surgery: A comprehensive test for Africa. Global-HELP Organization 13: 610-613.
3. Ekense SO, Agugua-Obianyo NEN, Odetunde GA (2006) The challenge of Nephroblastoma in developing Country. Ann Oncol 17: 1598-1600.
4. Varan A (2008) Wilms' Tumor in Children: An Overview. Nephron Clin Pract 108: c83-c90
5. Ahmed HU, Arya M, Tsiouris A, Sellaturay SV, Shergill IS, et al. (2007) An update on the management of Wilms' tumour. Eur J Surg Oncol 33: 824-831.
6. Ko EY, Ritchey ML (2009) Current management of Wilms' tumor in children. J Pediatr Urol 5: 56-65.
7. Breslow N, Beckwith JB, Ciol M, Sharples K (1988) Age distribution of Wilm's tumour: report from National Wilm's tumour study. Cancer Res 48: 1653-1657.
8. Hrabovsky EE, Othersen HB Jr, deLorimier A, Kelalis P, Beckwith JB, et al. (1986) Wilm's tumour in the neonate: a report from the National Wilms tumour study. J Pediatr Surg 21: 385-387.
9. Merten DE, Yang SS, Bernstein J (1976) Wilm's tumour in adolescent. Cancer 37: 1532-1538.
10. Huser J, Cringnon DJ, Ro JY, Ayala AG, Shannon RI, et al. (1990) Adult Wilm's tumour: a clinicopathologic study of 11 cases. Mod Pathol 3: 321-326.
11. Rosai and Ackerman (2011) Surgical pathology. (10thedn), Elsevier, USA.
12. Osuoji RI, Williams OM, Ajai OT, Idika OC, Abolarinwa AA, et al. (2011) Wilm's tumour experience in a developing tertiary centre in Nigeria. J Surg 16: 3.
13. Christopher D.M Fletcher (2007) Diagnostic Histopathology of Tumours. (3rd Edn), Elsevier, Philadelphia, USA.

Citation: Soyemi SS, Osuoji RI, Faduyile FA, Sanni DA, Oyewole OO, et al. (2013) Morphological Features of Wilms' Tumour in a Tertiary Health Care Institution: Our Findings. J Clin Exp Pathol 3: 146. doi:10.4172/2161-0681.1000146