East African Medical Journal Vol. 89 No. 4 April 2012
MANAGEMENT AND OUTCOME OF PATIENTS WITH WILMS' TUMOUR (NEPHROBLASTOMA) AT THE MOI TEACHING AND REFERRAL HOSPITAL, ELDORET, KENYA
C. N. Tenge, MBChB, MMed (Paed), Senior Lecturer, Department of Child Health and Paediarics, Moi University, School of Medicine, P. A. Were, Dip, MSC (Palliative Care), Nursing Officer, Oncology Department, Moi Teaching and Referral Hospital, P. O. Box 4606-30100, Eldoret, Kenya, L. H. Aluoch, MBChB, MMed (Paed), Lecturer, Department of Health Sciencies, Maseno University, Private Bag, Maseno, Kenya, J. W. Wekesa, Nursing Officer, Department of Oncology, Moi Teaching and Referral Hospital, K. Patel, BSc (Microb) MSc (Applied Bio), PhD (Bio Sci) Senior Lecturer, Department of Immunology and R. T. Kuremu, MBChB, MMed (Surg), Senior Lecturer, Moi University, School of Medicine, P. O. Box 4606-30100, Eldoret, Kenya

Request for reprints to: Dr. C. N. Tenge, Department of Child Health and Paediarics, Moi University School of Medicine, P. O. Box 4606-30100, Eldoret, Kenya

MANAGEMENT AND OUTCOME OF PATIENTS WITH WILMS' TUMOUR (NEPHROBLASTOMA) AT THE MOI TEACHING AND REFERRAL HOSPITAL, ELDORET, KENYA

C. N. TENGE, P. A. WERE, L. H. ALUOCH, J. W. WEKESA, K. PATEL and R. T. KUREMU

ABSTRACT

***Background*: Wilms' tumour is a common malignant neoplasm of the kidney and is ranked among the top six solid tumours in children in Kenya. Despite its rapid growth and therefore debilitating effects on its victims, it is one tumour that has shown good response to combined modality approach to its treatment with encouraging possibilities of survival even in resource poor settings.**

***Objective*: To evaluate the management and outcome of patients with Wilms' tumour attended to at Moi Teaching and Referral Hospital (MTRH) during the period between January 2000 and December 2007.**

***Design*: Retrospective Study.**

***Setting*: The Paediatric Oncology Service (Oncology unit in the Paediatric Ward, the Paediatric Surgical Ward and the Outpatient Oncology Clinic) at the Moi Teaching and Referral Hospital, Eldoret, Kenya.**

***Results*: Information of 45 patients diagnosed with Wilms' tumour was analysed. Forty two (93%) of the patients were referrals from various health facilities in the region. Twenty three (51%) were male and 34 (76%) were aged less than 48 months. Twenty five (56%) had the left kidney affected, 19 (42%) the right kidney and one (2%) bilateral. All the 45 (100%) had an abdominal ultrasound done but none had exhaustive investigations done to stage the disease. Only eight (18%) of the patients had a medical insurance cover. Fourty one (91%) of the patients received specific cancer treatment with 28 (62%) getting combined modality treatment. Nineteen (42%) were lost to follow up. Thirty (67%), 21 (47%), 15 (33%) and 13 (29%) patients were alive six months, one year, two years and three years respectively from the time of diagnosis. 29% survived beyond three years of diagnosis .**

***Conclusion*: Staging of Wilms tumour fell short of the expected. Neo-adjuvant chemotherapy reduced morbidity and mortality of patients managed for Wilms' tumour. Loss to follow up and cost of treatment had a negative impact on the outcome, a situation that requires to be improved.**

INTRODUCTION

In the 1960s, paediatric cancer survival worldwide was about ten percent. Currently, survival in resource rich settings (High income countries) is about 80% while in resource poor settings (low income countries), it is at about 25 % (1). In the developing world, the burden of cancer is a significant problem and presents real challenges due to a plethora of factors including late presentation, poverty, inaccessible health services, inadequate information, poor nutrition and significant co-morbidities (2- 4).

Wilms' tumour is one of the most common childhood tumours and the most common malignant tumour of the urinary tract (5, 6). It has the potential of cure with combined modality or multimodal

approach in its management (5, 8, 9). It is one of the success stories in paediatric oncology with long term survival and potential for cure. Survival approaches 90% in localised disease and over 70% for metastatic disease whereby relatively simple treatment therapies are applied in a working team approach between the paediatric surgeon, pathologist, oncologist and other healthcare providers (5, 7, 9).

The management of Wilms' tumour continues to evolve with two different approaches being taken by the National Wilms' Tumour Study Group (NWTSG) in North America and the International Society of Paediatric Oncology in Europe (SIOP) in regards to pre-operative chemotherapy (10, 11).

Efforts at combined modality treatment of Wilms' tumour at MTRH are recent following the establishment of the Oncology Service in Western Kenya region. Chemotherapy and Surgery with the absence of radiotherapy was the mainstay in the management of these patients. This study was therefore carried out to evaluate the management and outcome of patients diagnosed with Wilms' tumour at the hospital.

MATERIALS AND METHODS

The clinical records of all the patients with a final diagnosis of Wilms' tumour or Nephroblastoma seen at the Moi Teaching ad Referral Hospital (MTRH) during an eight year period (January 200 to December 2007) were reviewed. Medical records were studied with respect to the demographic characteristics, clinical evaluation, mode of treatment, follow up and outcome of the patients.

55 patients were diagnosed with Wilms' tumour and attended to at the hospital during the study period but records of 45 patients were retrieved and the required information transferred onto a pre-formed format sheet.

The data obtained was analysed using the statistical package for social scientists (SPSS). Frequency and descriptive statistics were computed.

RESULTS

A total of 55 patients were diagnosed and managed for Wilms' tumour at the MTRH during the period between January 2000 and December 2007 giving an average of seven new patients enrolled each year. Clinical records of 45 patients were retrieved and analysed.

Figure 1 shows that 42 (93.3%) of the patients were referrals from various health facilities mainly District Hospitals (Table 1) in the region. There were 23 (51%) male and 22 (49%) female. Their age range was 12 to 96 months with a median of 42 months. 34 (75.5%) of the patients were aged less than 48 months.

The left kidney was affected in 25 (56%), the right in 19 (42%) and one (2%) had both kidneys affected. All the 45 (100%) patients had ultrasound done, 32 (71.5%) intravenous urography and 28 (62.2%) had either a histological (4/28) or cytological (24/28) report (Table 2).

Fourty one (91%) of the patients received some specific cancer treatment with 25 (55.5%), three (6.7%), nine (20%) and four (8.9%) getting neoadjuvant chemotherapy, adjuvant chemotherapy, chemotherapy alone and surgery alone respectively (Table 3). Figure 3 shows that 32(71%) of the patients had nephrectomy done with 25(55.5%) receiving pre-operative chemotherapy. Four of the seven patients who did not receive pre-operative chemotherapy died either intra-operatively or during the immediate post-operative period.

Figure 4 shows that only eight (17.8%) of the patients had a medical insurance cover while 19 (42.2%) settled their hospital bills by paying cash and 18 (40%) had their bills waived.

Table 5 shows that 19 (42.2%) of the patients were lost to follow while 13 (28.9%) died.

Table 6 shows that the survival rates were 66.7%, 46.7%, 33.3% and 28.9% at six months, one year, two years and three years respectively. Event free survival of patients beyond three years of diagnosis was considered as cure.

Figure 1
Referrals

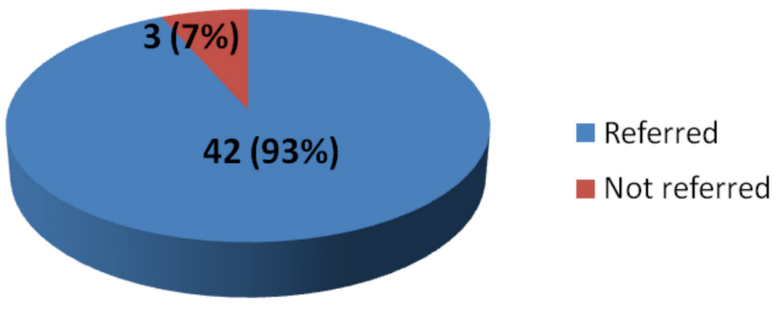


Table 1
Health Facilities

Health Facility	No. of patients
District hospital	21
Private hospital	6
Mission hospital	5
Health centres	2
Provincial hospital	2
No information	6

Figure 2
Age Distribution

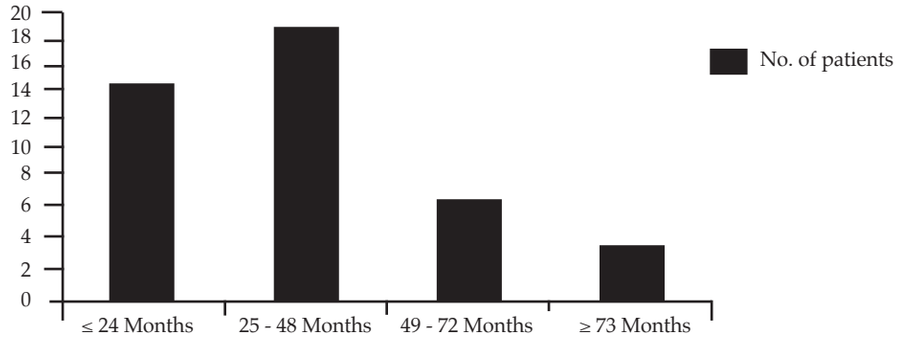


Table 2
Age distribution

Age Range	No. of Patients	%
≤ 24 Months	15	33.3
25-48 Months	19	42.2
49-72 Months	7	15.6
≥ 73 Months	4	8.9

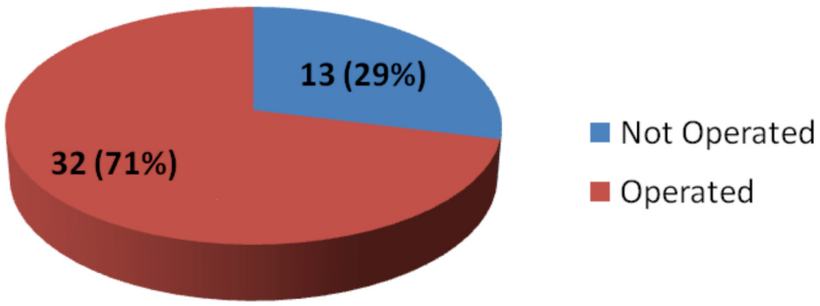
Table 3
Investigations done

	No. of patients	%
Abd. Ultrasound	45	100
IVU	32	71.7
CXR	5	11.1
CT Scan	1	2.2
Cytology/Histology	28	62.2

Table 4
Specific management

	No. of patients	%
No Treatment	4	8.9
Surgery alone	4	8.9
Chemo Rx alone	9	20.0
Adjuvant Chemo Rx	3	6.7
Neo adjuvant Chemo Rx	25	55.5
Total	45	100.0

Figure 2



- Of those 13 patients not operated: - Four died, four declined and five lost follow up
- Of those 32 patients operated: - 25 received pre-operative chemotherapy, and seven did not receive pre-operative (four of the seven died intra-operatively and post-operatively)

Figure 3
Payment responsibility

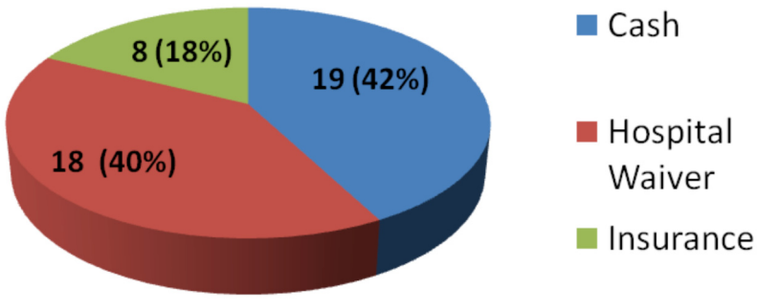


Table 5
Outcome

Year	No. of Patients	Died	Lost to follow up	Stable on follow up
2000	5	2	2	1
2001	4	1	3	0
2002	7	2	4	1
2003	7	3	4	0
2004	5	1	3	1
2005	5	1	1	3
2006	5	1	1	3
2007	7	2	1	4

Table 6
Survival rates

Year	Dead	Loss up follow up	Still on follow up	Known Whereabouts	%
0.5	6	9	-	30	66.7
1	2	7	-	21	46.7
2	4	2	4	15	33.3
3	1	1	3	13	28.9
4	0	0	3	13	28.9
≥5	0	0	3	13	28.9
Total	13	19	13	13	28.9
	28.9%	42.2%	28.9%		

DISCUSSION

Wilms' tumour (Nephroblastoma) is one of the most common solid tumours in Kenya. Its management at MTRH has had its share of tribulations expected in a resource limited environment. Some semblance of order in managing this tumour at MTRH was ushered in by the establishment of an oncology unit in the paediatric ward in the year 2000 and the eventual establishment of an oncology outpatient clinic and formalisation of the oncology service at the hospital in the year 2004. However, problems stemming from poor infrastructure, lack of resources, retrogressive traditional beliefs and the ever increasing cost of care that is shouldered by the poor rural population still stalk the gallant efforts of this service. Before 2000, most of the patients were referred to Kenyatta National Hospital, 350 kilometres away.

Before 2000, attempted management at the institution was not organised, the documentation was not up to date, the outcome of the patients was poor and there were no proper mechanisms of follow up.

A total of 55 patients were diagnosed during the eight year period of the study giving an average of about seven new cases each year. This is almost similar to the study where 106 patients were seen over an 18 year period with an average of six new patients a year.

Similar to several other studies where there is approximately equal frequency in both sexes and races, the male (23) to female (22) ratio of 1:1 was observed (5, 6, 12, 13).

Thirty four (76 %) of the patients were aged less than 48 months with a median age at diagnosis of 42 months. This is a tumour of the younger age group and other studies have shown similar results (5, 6, 8).

There is variation in the kidney affected as shown by other studies. In our study, slightly more children 25 (56%) had the left kidney affected. These findings are similar to the studies where the left kidney was affected in 51 and 67% of the cases respectively. In another study, the right kidney was affected in 65% of the cases (12-14).

The diagnosis and staging of Wilms' tumour still remains a challenge in our set up. Twenty eight (62.2%) of the patients had either a cytological (24/28) or histological report (4/28). Other than indicating the presence of malignant cells, cytology is not specific enough to be of any significant value in terms of prognosis or type of treatment. This test is also being discarded and efforts to secure trucut needles are being made so that biopsy and histology characterisation of Wilms' tumour is done. Though all patients 45 (100%) had an ultrasound done based on the anatomical nature of Wilms' tumour and the fact that an abdominal mass is the main symptom or sign that leads to seeking medical attention, none of the patients had exhaustive investigation directed towards staging the tumour due to high cost. Only eight (18%) of the patients had a health insurance cover (NHIF) to support the cost of care. While 37 (82%) either had their bills waived or settled the bills by paying cash, one would understand why the clinicians opted to institute specific treatment rather than emphasize on exhaustive investigations which are often associated with significant delays.

The protocol for the management of Wilm's tumour is a modification of protocols by both the National Wilms' Tumour Study Group (NWTSG) in North America and the International Society of Paediatric Oncology (SIOP) in Europe (7,10,11). The modification is necessitated by the problems that present with this tumour in our environment. Majority of our patients present with huge tumours occupying almost the whole of the abdominal cavity, emaciation, anaemia and other co-morbidities. In our study, 32 (71%) of patients were operated upon with 25 receiving pre-operative chemotherapy while of the seven who did not receive pre-operative chemotherapy a high mortality (four out of seven) during the peri-operative period was noted indicating the

challenges encountered in operating advanced tumours. Neo-adjuvant chemotherapy followed by nephrectomy versus primary nephrectomy appears to be the appropriate option to adopt in our set up (9-11).

Improvement in the survival rates has been steady over the years since 2000 especially after 2004 when the oncology service was formally set up. The major set back is loss to follow up as the whereabouts of 19 (42.2%) were not known within two years of enrolment. nine of the 13 patient who were not operated declined and were subsequently lost to follow up. The community which MTRH serves believes that cancer should never be managed by operation. Change however has been noted in attitude and appreciation of the role of combined modal management of oncology patients as an increasing number of patients both children and adults are surviving and going back to the community as testimony of the effectiveness of current management over traditional treatment.

Excluding patients lost to follow-up, 13 out of 26 were survivors at three years. The same 13 were still alive and attending clinic beyond three years of diagnosis. Efforts are being made to address the issue of loss to follow up and the cost of cancer treatment. The community is being encouraged to purchase the health insurance cover (National Hospital Insurance Fund) which has expanded its inclusion to carter for all Kenyans including those not in formal employment. Training of healthcare providers on cancer, identification, diagnosis and treatment with special emphasis on use of standard protocols specifically designed for our set up is also being undertaken. Efforts to make cancer management available, accessible and affordable are in place through sensitisation of relevant authorities in the government, medical training institutions and health institution on the fact that cancer is curable particularly if diagnosed and treated early. Collaboration between resource rich and resource poor countries in terms of technology transfer and research activities is also being undertaken.

Considering that majority of our patients 42(93.3%) were referred by health units that are at level four and five, there is need to empower other health units particularly level 4(District hospitals) and five (Provincial hospitals) to manage cancers and only refer those cases that require specialised treatment. Referral plays a significant role in the delay and hence late presentation of most of the cases.

REFERENCES

1. Mwanda, O. W. Cancers in Children Younger than the Age 16 years in Kenya. *East Afr. Med. J.* 1995; **72**: 25-29.
2. Mukibii, J. M., Banda, L., Liomba, N. G., *et al.* Spectrum of Childhood Cancers in Malawi 1985-1993. *East Afr.Med. J.* 1995; **72**: 25-29.
3. Stiller, C. A. and Parkin, D. M. International Variations in the Incident of Childhood Renal Tumours. *Br. J. cancer*. 1990; **62**: 1026-1030.
4. K. Pritchard – Jones. Controversies and Advances in the Management of Wilms' Tumour. *Arch. Dis. Child.* 2002: **87**: 241 – 244.
5. Hadley, G. P. and Shaik, A. S. The Morbidity and Outcome of Surgery in Children with Pre-treated Wilms' Tumour: size matters. *Pediatri. Surg.* 2006; **22**: 409-412.
6. Hadley, G. P. Can Surgeons fill the Void in the Management of Children with Solid Tumours in not-Developing Countries? *Pediatri. Blood Cancer.* 2010; **55**: 16 – 17.
7. Masera, G. Paediatric Cancer Survival: High versus Low Income Countries. *Haematological*. 2000; **85**: 785.
8. Kanavos, P. The Rising Burden of Cancer in the Developing World. *Annals of Oncology.* 2006; **17** (Supi 8): viii 15 – viii 14.
9. Ngoma, T. World Trade Heath Organization. Cancer priorities in developing countries. *Ann Oncology.* 2006; **8**: viii 9 – viii 14.
10. Pal, S. K. and Mittal, B. Fight against cancer in countries with limited resources:- the post genomic era scenario, *Asian Pac. J. Cancer Prov:* 2004; **5**: 328 – 333.
11. Pienezza M. L., Rubin, S., Bass, J., *et al.* Wilms' tumour at the Children's Hospital of Eastern Ontario: 1990 – 2001. *Can J. Urol.* 2004; **11**: 2151 – 2156.
12. Seyed–Ahadi, M. M., Khaleghnejad–Tabari, A., Mkshemirani, A., *et al.* Wilms' tumour, a 10 year retrospective study. *Arch. Iran Med.* 2007: **10**: 65 – 69.
13. Yildiz, I., Yuksel, L., Ozkan, A., *et al.* Multidisciplinary approach to Wilms' tumour. 18 years experience. *JpnJ Clinical Oncol.* 2000; **30**: 17-20.
14. Asensio-Lahoz, L. A., Sandoval-Gonzalez, F., Abaitua-Bilbao, J., *et al.* Wilms' tumour in Cantabaria. Review of our cases (1979 – 1990). *Arch. Esp. Urol.* 1991; **44**: 989 – 992.
15. WU, H. Y., Synder, H. M. 3rd. and D'Angio, G. J. Wilms' tumour management. *Curr. Opin Urol.* 2005; **15**: 273 – 276.
16. Spreafic, F. and Bellani, F. F. Wilms' tumour: past, present and (possibly) future. *Expert Rev. Anticancer Ther.* 2006; **6**: 249 – 258.
17. Cheah, P. L., Loor, L. M. and Lin, H. P. Wilms' tumour in Malaysian children: a histopathological study of cases encountered at the university hospital, Kuala Lumpur over a 22 year period. *Malays J. Pathol*. 1992; **14**: 111 – 115.

18. Lin, D. T., Hou, J. W., Lin, K. H. *et al*. Clinical Observation of Wilms' tumour . Zhonghua Min Guo Xiao Er Ke Yi Xue. *Hui Za Zhi.* 1990; **31**: 299 – 306.

19. Lopez-Lopez, J. A., Valdivia -Urla, J. G., Munoz-Campos, I., *et al*. Wilms' tumour. The experience of the University Clinical Hospital of Zarogaza.