AUDIT OF RHABDOMYOSARCOMA AMONG CHILDREN ADMITTED IN TERTIARY CARE HOSPITAL

Shahid Mahmood[1]

ABSTRACT

Background: Rhobdomyosarcoma in usually a children tumor, with variable outcome. **Objective:** To determine the clinical presentation, site of distribution, histological type, stage at presentation and outcome in children diagnosed as case of rhabdomyosarcoma in oncology department in Children Hospital, Lahore. **Patients and Methods:** Study design: Cross sectional study. Place and Duration of Study**:** This study was conducted from 1st January 2009 to 31st December 2012 in Oncology Department in Children Hospital Lahore, Pakistan. A total of 44 children (1-15 years of age) diagnosed as case of rhabdomyosarcoma were included in the study. Rhabdomyosarcoma was diagnosed on tissue biopsy. Required investigations for staging of the tumour were done like bone marrow aspiration, C.T. scan whole body, bone scan. Metastatic disease was considered as stage IV disease. Staging of the tumour was done according to the EpSSG staging. After staging chemotherapy, surgery, radiotherapy was decided according to the UKCCG protocols of rhabdomyosarcoma. All the protocols were given in the oncology ward under strict supervision, surgery was done in pediatric sugery department whenever it was needed. Response of the treatment was seen on C.T. scan after chemotherapy and it was compared with previous C.T. scan taken before treatment. Descriptive statistic like mean or proportion was calculated for age, sex, and presenting complaints before hospitalization. An intention to treat analysis for stage of disease at presentation and outcome in cases was performed. The data was entered and analyzed in SPSS version 12. **Results:** The children included in the study were of 1 to 15 years of age. Nineteen (43.5%) children were less than 05 years, 21(47.7%) children were 5-10 years of age group and 04 (9.1%) children were above 10 years of age. Out of 44 children 18(40.9%) were males and 26(59.1%) were female, Out of 44 children 41(93.2%) children were having metastatic disease at the time of presentation and only 03(6.8%) children were without metastasis. 09(20.5%) children expired during the treatment, 24(54.5%) children completed the treatment and were kept on monthly follow up, 07(15.9%) children left against medical advice and 04(9.1%) children got relapse of the disease. Histology was confirmed in only 08(18.1%) children, 01(2.3%) was alveolar type, 01(2.3%) was spindle cell type and 06(13.6%) were embryonal type. In 36(81.8%) children we were unable to detect the histological type. **Conclusion:** Rhabdomyosarcoma can involve any part of the body, more over early detection of rhabdomyosarcoma can give better prognosis.

Keywords: Rhabdomyosarcoma, Children, Outcome, presentation.

JSZMC 2015;6(1):770-773

INTRODUCTION

Childhood rhabdomyosarcoma, a soft tissue malignant tumor of mesenchymal origin, accounts for approximately 3.5% of the cases of cancer among children aged 0 to 14 years and 2% of the cases among adolescents and young adults aged 15 to 19 years. The incidence is 4.5 per 1 million children and 50% of cases are seen in the first decade of life.[1,2,3] Incidence vary with histologic type, patients with embryonal rhabdomyosarcoma are predominantly male and peaks in the 0 to 4 year age group at approximately 4 cases per 1 million children, with a lower rate in adolescents, approximately 1.5 cases per 1 million adolescents.[1] The incidence of alveolar rhabdomyosarcoma does not vary by gender and is constant from ages 0 to 19 years at approximately 1 case per 1 million children and adolescents.[1] Compared with older patients, infants younger than 1 year have a higher incidence of undifferentiated sarcoma and tumors of the trunk and abdomen and a lower incidence of parameningeal tumors.[2]

Genetic conditions associated with rhabdomyosarcoma include Li-Fraumeni cancer susceptibility syndrome (with germline *p53* mutations), pleuropulmonary blastoma (with DICER1 mutations), neurofibromatosis type I, Costello syndrome (with germline HRAS mutations), Beckwith-Wiedemann syndrome (with which Wilms tumor and hepatoblastoma are more commonly associated), and Noonan syndrome.[4,5,6,7]

The most common primary sites for rhabdomyosarcoma are the head, the genitourinary tract, and the extremities. Within extremity tumors, tumors of the hand and foot occur more often in older patients and have an alveolar histology; these tumors also have a higher rate of metastatic spread. Other less common primary sites include the trunk, chest wall, perineal/anal region, and abdomen including

1. Children Hospital Lahore, University of Health Sciences Lahore, Pakistan.

Correspondence: Dr. Shahid Mahmood, Senior Registrar, Children Hospital Lahore, H.no. 32-H Aitchison Society Raiwind Road Lahore.

Phone: +92-3366741496 **Email:** shahid233@hotmail.com

Received: 07-4-2014 **Accepted:** 14-03-2015

the retroperitoneum and biliary tract.[3,4,5] Rhabdomyosarcoma is usually curable in most children with localized disease who receive combined-modality therapy, with more than 70% surviving 5 years after diagnosis.[3,4] The prognosis for a child or adolescent with rhabdomyosarcoma is related to the age of the patient, site of origin, tumor size (widest diameter), resectability, presence of metastases, number of metastatic sites tissues involved, presence or absence of regional lymph node involvement, histopathologic subtype (alveolar vs. embryonal), and delivery of radiation therapy in selected cases.[8,9,10,11] This study was conducted to determine the clinical presentation, site of distribution, histlogical type, stage at presentation and outcome in children diagnosed as case of rhabdomyosarcom.

PATIENTS AND METHODS

This study was conducted in Oncology ward, Children Hospital Lahore. It was cross sectional study. Duration of study was from 1st January 2009 to 31st December 2012. 44 children were selected and sampling technique was Convenience sampling. Children having 1 year to 15 years of age, with suspicion of rhabdomyosarcoma presenting in Children Hospital Lahore in Department of Oncology and diagnosed on tissue biopsy as a case of rhabdomyosarcoma were included in the study.

All the children whose tissue biopsy was negative for rhabdomyosarcoma were excluded from the study. Approval from Institutional Ethical Committee was taken. Informed consent from the parents or attendants was taken as well. The basic demographic information including name, age, sex and address was recorded. History of present illness was inquired with regard to symptoms, their severity and duration.

On biopsy type of rhabdomyosarcoma was noted and recorded. Required investigations for staging of the tumour were done like bone marrow aspiration, C.T. scan whole body, bone scan. Metastatic disease was considered as stage IV disease. Staging of the tumour was done according to the EpSSG staging. After staging, chemotherapy, surgery and radiotherapy was decided according to the UKCCG protocols of rhabdomyosarcoma. All the protocols were given in the oncology ward under strict supervision, surgery was done in pediatric surgery department whenever it was needed. Response of the treatment was seen on C.T. scan after chemotherapy and it was compared with previous C.T. scan taken before treatment. Descriptive statistic was calculated for age, sex and presenting complaints before hospitalization. An intention to treat analysis for stage of disease at presentation and outcome in cases was performed. The data was entered and analyzed in SPSS version 12.

RESULTS

In this study, we noted the clinical presentation, site of distribution, histological type, stage at presentation and outcome in children diagnosed as rhabdomyosarcoma. A total of 44 patients were included in this study. All patients were treated in oncology department under strict monitoring and supervision. The children included in the study were of 1 to 15 years of age. Nineteen (43.2%) children were less than 05 years old, 21(47.7%) children were 5-10 years of age group and 04(9.1%) children were above 10 years of age. 18(40.9%) were males and 26(59.1%) were female. Out of 44 children, 41(93.2%) children were having metastatic disease at the time of presentation and only 03(6.8%) children were without metastasis at the time of presentation (Table I). Tumour was detected in 44(100%) children. Moreover sign and symptoms were according to the involvement of the system in the body. Cardiovascular symptoms were detected in 01(2.3%) case. Respiratory symptoms were also seen in only 01(2.3%) case. 09(20.5%) were having sign and symptoms of gastrointestinal tract. There were 20(45.4%) children who were having multiple system involvement and were having mix sign and symptoms. Out of 44 children, 09(20.5%) children expired during the treatment, 24(54.5%) children completed the treatment and were kept on our monthly follow up, 07(15.9%) children left against medical advice because they left during the treatment and 04(9.1%) children got relapse of the disease. Histology was confirmed in only 08(18.1%) children, 01(2.3%) was alveolar type, 01(2.3%) was spindle cell type and 06(13.6%) were embryonal type. In 36(81.8%) children we were unable to detect the histological type. Rhabdomyosarcoma can involve any part of the body following frequency of the involvement was observed abdomen 04(9.1%), arm 01(2.3%), cardiac 01(2.3%), ear 01(2.3%), eye

03(6.8%), liver 01(2.3%), neck 08(18.1%), perineal 01(2.3%), pharynx 01(2.3%), testes 01(2.3%), vaginal 01(2.3%) and 20(45.4%) children were of unknown origin because they were having involvement of multiple organs due to distant metastasis.

Table I: Summary of rhabdomyosarcoma cases in children hospital (n=44)

Age	< 5 YEARS	19 (43.2%)
	5-10 YEARS	21 (47.7%)
	>10YEARS	04 (9.1%)
Gender	Females	18 (40.9%)
	Males	26 (59.1%)
Metastasis	Metastatic	41 (93.2%)
	Non-Metastatic	03 (6.8%)
Outcome	Expired	09 (20.5%)
	On Follow Up	24 (54.5%)
	LAMA	07 (15.9%)
	Relapse	04 (9.1%)
Histology	Alveolar	01 (2.3%)
	Embryonal	06 (13.6%)
	Spindle Cell	01 (2.3%)
	Unknown	36 (81.8%)
Sign & symptoms	Tumour	44 (100%)
	CVS	01 (2.3%)
	GIT	09 (20.5%)
	Respiratory	01 (2.3%)
	MIX	20 (45.4%)

DISCUSSION

This study showed that early diagnosis at initial stages has a significant beneficial effect in children suffering from rhabdomyosarcoma. This study reported that rhabdomyosarcoma can involve any part of the body and clinical presentation may vary according to the system involved.

Casanova in 2009 and Smith that metastasis of the rhabdomyosarcoma means, it is stage IV and it always gives bad prognosis.[9,10] In our study it was observed that most of the children were having metastasis at the time of presentation and it was a bad prognostic sign.

According to Ognjanovic and Linabery, the incidence of rhabdomyosarcoma is 4.5 per 1 million children and 50% of cases are seen in the first decade of life.[1] In our study most of the children were less than 10 years of age. Only 04 children were more than 10 years of age. In our study majority of the children were males. All the children who expired were having metastasis at the time of presentation. Relapsed cases were also having metastasis at the time of presentation. Most of the children were showing embryonal histology. Alveolar and spindle cell histology is very rarely seen. Crist and Maurer reported in their study that the most common primary sites for rhabdomyosarcoma were the head, the genitourinary tract, and the extremities.[8,12] In our study, although any area of the body can be involved by the rhabdomyosarcoma but head and neck was having largest frequency of rhabdomyosarcoma. In many children it is difficult to decide the original area of the body involved because rhbdomyosarcoma tumour involves multiple areas.[13,14]

CONCLUSION

Rhabdomyosarcoma can involve any part of the body, more over early detection at the early stages of rhabdomyosarcoma can give better prognosis.

REFERENCES

1. Ognjanovic S, Linabery AM, Charbonneau B. Trends in childhood rhabdomyosarcoma incidence and survival in the United States, 1975-2005. Cancer 2009;115 (18): 4218-26.
2. Gurney JG, Severson RK, Davis S. Incidence of cancer in children in the United States. Sex-, race-, and 1-year age- specific rates by histologic type. Cancer 1995;75 (8): 2186-95.
3. Ries LA, Kosary CL, Hankey BF. eds.: SEER Cancer Statistics Review, 1973-1996. Bethesda, Md: National Cancer Institute, 1999.
4. Kratz CP, Rapisuwon S, Reed H.Cancer in Noonan, Costello, cardiofaciocutaneous and LEOPARD syndromes. Am J Med Genet C Semin Med Genet 2011;157 (2): 83-9.
5. Gripp KW. Tumor predisposition in Costello syndrome. Am J Med Genet C Semin Med Genet 2005;137 (1): 72-7.
6. Trahair T, Andrews L, Cohn RJ: Recognition of Li Fraumeni syndrome at diagnosis of a locally advanced extremity rhabdomyosarcoma.Pediatr Blood Cancer 2007;48 (3): 345-8.
7. Doros L, Yang J, Dehner L, et al. DICER1 mutations in embryonal rhabdomyosarcomas from children with and without familial PPB-tumor predisposition syndrome. Pediatr Blood Cancer 2012;59 (3): 558-60.
8. Crist W, Gehan EA, Ragab AH. The Third Intergroup Rhabd. study. J Clin Oncol 1995;13 (3): 610-30.
9. Casanova M, Meazza C, Favini F. Rhabdomyosarcoma of the extremities a focus on

tumors arising in the hand and foot. Pediatr Hematol Oncol Jul-Aug 2009; 26 (5): 321-31.
10. Smith LM, Anderson JR, Qualman SJ.Which patients with microscopic disease and rhabdomyosarcoma experience relapse after therapy? A report from the soft tissue sarcoma committee of the children's oncology group. J Clin Oncol 2001;19 (20): 4058-64.
11. Breneman JC, Lyden E, Pappo AS. Prognostic factors and clinical outcomes in children and adolescents with metastatic rhabdomyosarcoma--a report from the Intergroup Rhabdomyosarcoma Study IV. J Clin Oncol 2003;21 (1): 78-84.
12. Maurer HM, Gehan EA, Beltangady M. The Intergroup Rhabdomyosarcoma Study-II. Cancer 1993;71 (5): 1904-22.
13. Joshi D, Anderson JR, Paidas C. Age is an independent prognostic factor in rhabdomyosarcoma: a report from the Soft Tissue Sarcoma Committee of the Children's Oncology Group. Pediatr Blood Cancer 2004;42 (1): 64-73.
14. Malempati S, Rodeberg DA, Donaldson SS. Rhabdomyosarcoma in infants younger than 1 year: a report from the Children's Oncology Group. Cancer 2011;117 (15): 3493-501.