## Original Research Paper



# THE SPECTRUM OF MALIGNANT SOLID PEDIATRIC TUMORS IN THE AGE GROUP OF 0-18 YEARS: A PROSPECTIVE STUDY

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**ABSTRACT** 

**OBJECTIVE:** The purpose of this prospective study is to study the spectrum of pediatric solid malignancies at our institution.

**METHOD:** This study is under taken to evaluate the incidence and morphological features of solid malignant paediatric tumors in eighteen years and below. The material for present study is obtained from FNAC in cytology and biopsy specimen in histology department of RNT Medical college, Udaipur.

**RESULT:** A total number 60 cases of malignant solid pediatric tumors of age group 0-18 years were diagnosed in Department of Pathology RNT Medical college Udaipur, during a period of two years. The number of malignancies diagnosed by Cytology accounted for 53.33% while Histopathology contributed 46.67% respectively. The male: Female ratio of childhood solid malignancies was 1.73:1. In malignant solid pediatric tumors CNS tumors were the commonest constituting 30% followed by Lymphoma 23.33%, Bone tumors 11.67% and neuroblastoma, retinoblastoma & spindle cell neoplasm 3.33% each.

**CONCLUSION:** Our study concluded that solid malignant pediatric tumors contribute also a health problem in Udaipur region affecting all pediatric age group but more prevalent in the age group 6-10 years & 15-18 years.

## **KEYWORDS**: Malignant Pediatric Solid Tumors

#### INTRODUCTION

Cancer in children and adolescents is rare although the overall incidence of childhood cancer has been slowly increasing since 1975. Childhood cancer remains the leading cause of disease-related mortality in children.2 Malignant solid tumors account for approximately 30% of childhood cancers.3 The predominant histology of specific solid tumors varies significantly with age.4 Dramatic improvements in survival have been achieved in children and adolescents with cancer. Between 1975 and 2010, childhood cancer mortality decreased by >50%. Incidence of paediatric tumours is on the rise all over the world. In developing countries like India childhood mortality is still due to malnutrition and infections, but paediatric tumours are also rising in number. In general, the features of malignancies in children differ biologically and histologically from those of adults with respect to incidence, type of tumor, underlying familial or genetic aberration and tendency to regress spontaneously or cytodifferantiate.7

#### MATERIAL AND METHODS

This prospective study is conducted in the Department of Pathology in RNT medical college and MB hospital Udaipur from August 2017 to July 2019 over a period of two years. It comprised of an analysis of 60 cases of Pediatric solid malignancies. Study subjects are all pediatric patients referred for FNAC of palpable mass and biopsies of specimen of tumors obtained from pediatric patient after surgery.

#### RESULTS

A total number 60 cases of malignant solid pediatric tumors of age group 0-18 years were diagnosed in Department of Pathology RNT Medical college Udaipur, during a period of two years. The number of malignancies diagnosed by Cytology accounted for 53.33% while Histopathology contributed 46.67% respectively. Pediatric malignancies were relatively common in the age group 6-10 years accounting for 30% and 15-18 years age group also 30% followed by 0-5 years age group (21.67%) and 11-14 years age groups (18.33%). In general, the malignancies were more common in males then females. The male: Female ratio of childhood solid malignancies was 1.73:1. In malignant solid pediatric tumors CNS tumors were the commonest constituting 30% followed by

Lymphoma 23.33%, Bone tumors 11.67% and neuroblastoma, retinoblastoma & spindle cell neoplasm 3.33% each. CNS tumors were found to be more common in males then females. The male: female for CNS tumors was 2:1. Most of cases of CNS tumors were seen in the age group 0-5years (8.33%), 6-10 years (8.33%), 11-14 years (8.33%), 15-18 years (5%) and the commonest being medulloblastoma (38.89%) followed by Astrocytoma (27.78%).

Lymphoma is second most common solid pediatric maligna ncy were more commonly seen in males then females. Most of cases of lymphoma were seen at 6-10 years (10%) of age group. Acute lymphoblastic leukemia with lymphoma predominated over Hodgkin's lymphoma.

Most of bone tumors were seen in age groups of 6-10 years (5%) and 11-14 years (5%). Osteosarcoma comprised 6.67% and Ewing's sarcoma 3.33% of total malignancies. Round cell tumors (10%) and retinoblastoma (3.33%), neuroblastoma (3.33%), spindle cell neoplasm (3.33%) cases of total malignancy also found. Age group wise incidence of most common type of malignancies in 0-5 years (CNS tumors 8.33%), 6-10 years (lymphoma 10%), 11-14 years (CNS tumors 8.33%), 15-18 years (Lymphoma 8.33%) were found.

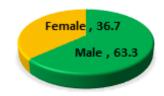


Figure 1: Percent Distribution of patients according to gender

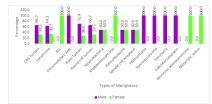


Figure 2: Sex wise distribution of pediatric malignancies



Figure 3: Incidence of Brain Tumors (Sex wise distribution)

#### DISCUSSION

Present study was conducted in the Department of Pathology in RNT medical college Udaipur from August 2017 to July 2019 over a period of two years. It comprised of an analysis of 60 cases of Pediatric solid malignancies.

All these cases were reviewed as regards to incidence, age Comparison of type of childhood malignancies with other studies:

have been compared with similar studied of other authors. Comparison of Male: Female ratio of Childhood Maligna

## ncies with other studies:

and sex distribution, nature and pattern. The results observed

		Nagaraja CT et al <sup>10</sup>				Present study
1.5:1	1.38:1	1.57:1	1.5:1	1.04:1	1.73:1	1.73:1

The incidence was more common in males then females when all cases of childhood malignancies were taken in to account in present study (1.73:1) which is equally ratio seen in study of Jan M et al $^{13}$  (1.73:1) and which is slightly higher than the study from Saini M et al<sup>®</sup>& Gupta N et al<sup>11</sup> (1.5:1 )each and Jignasa BN et al $^9$  (1.38:1), Nagaraja CT et al $^{10}$  (1.57:1), Sharma N et al $^{12}$ 

Type of Childhood	Gupta N	Sharma N	Sam Met	Wani LA et	Nagaraja CT et	Present Study	
Malignancies	et al¹¹(%)	et al <sup>12</sup> (%)	Al <sup>8</sup> (%)	al <sup>14</sup> (%)	al <sup>10</sup> (%)	(%)	
CNS tumor	8.33	25.74	13.93	8.6	7.57	30	
Lymphoma	38.33	-	8.48	23.91	31.81	23.33	
Bone tumors	15	20.46	10.90	8.6	12.12	11.67	
Neuroblastoma	3.33	4.9	2.42	6.5	3.03	3.33	
Rhabdomyosarcoma	-	5.6	0.606	-	13.63	1.67	
Retinoblastoma	3.33	2.6	4.24	23.91	3.03	3.33	
In present study CNS to	umors were comn	nonest malignand	cies CONCLU	SION			
(30%) which is approximately similar to study of Sharma N et Our study concluded that solid malignant pediatric tumors							
al (25.74%). Above present study second commonest				contribute also a childhood health problem in Udaipur region			
malignancies lymphoma cases (23.33%) were equal to the			the affecting	affecting all pediatric age group but more prevalent in the age			
study of cases of wani	one group 6-1	group 6-10 years & 15-18 years. FNAC is an important safe and					
tumors cases (11.67%) s	sliahtly eaual to st	udv of cases of So	gini effective	process for early	v diaanosis altho	ouah histological	

tumors cases (11.67%) slightly equal to study of cases of Saini M et al (10.90%) & Nagaraja CT et al (12.12%). Our study of Retinoblastoma (3.33%) & Neuroblastoma (3.33%) maligna ncies were equal to the studies of Gupta N et al (3.33% each) & Nagaraja CT et al (3.03% each).Rhabdomyosarcoma in present study (1.67%) which is slightly higher than study of Saini M et al(0.606%) and lower than study of Sharma N et al (5.6%). Present study shows that CNS tumors cases were maximum in number (30%) followed by Lymphoma cases were (23.33%), Bone tumors (11.67%) Neuroblastoma (3.33%), Retinoblastoma (3.33%) and Rhabdomyosarcoma (1.67%) also shows that childhood solid malignancies were more commonly seen in male then female. Present study shows most of cases of CNS tumors were seen in the age groups of 0-5 years (27.77%), 6-10 years (27.77%),11-14 years (27.77%) followed by 15-18 years (16.66%) and it also shows that CNS tumors more common in male than in female children. Total ratio of M:F of CNS tumors in our study was 2:1 which is similar to study of Jahan F et al15 (2013) Patients included in that study where male to female ratio of 2.1:1.

#### Comparison of Lymphoma, CNS tumors and Bone tumors with other studies:

Malignancy	Banerjee et	Venugopal et	SharmaS et	Present
Туре	$al^{16}$	$al^{17}$	$al^{18}$	study
Lymphoma	25.92%	20.95%	21.41%	23.33%
CNS tumors	15.32%	-	9.74%	30%
Bone tumors	10.52%	3.8%	9.74%	11.67%

Looking to the various age group, in the age group 15-18 years we could not find any specific or recordable difference. This was done as most of other authors have their study group 0-14

Most of workers have included hematological malignancies in their study while we have taken cases of solid tumors only. They are not in concurrence with such study. Our study is in concurrence with study of Nagaraja CT et al (2015), Gupta N et al (2017), Wani LA et al (2018).

### REFERENCES

examination is confirmatory.

- Barr R, Riberio R, Agarwal B, Masera G, Hesseling P, Magrath I. Pediatric oncology in countries with limited resources. In: Pizzo PA, Poplack DG, editors. Principles and Practice of Pediatric Oncology. 5th ed. Philadelphia: Lippincott Williams and Wilkins; 2006. p. 1605-17.
- Jemal A, Siegel R, Ward E, Hao Y, Xu J, Thun MJ. Cancer statistics, 2009. CA Cancer J Clin 2009;59:225-49.
- Bleyer A, O'Leary M, Barr R, Ries LA, editors. Cancer Epidemiology in Older Adolescents and Young Adults 15 to 29 Years of Age, Including SEER Incidence and Survival: 1975-2000. NIH Publication. No. 06-5767. Bethesda, MD: National Cancer Institute; 2006.
- Crist WM, Anderson JR, Meza JL, Fryer C, Raney RB, Ruymann FB, et al. Intergroup rhabdomyosarcoma study-IV: Results for patients with nonmetastatic disease. J Clin Oncol 2001; 19:3091-102. Howlader N, Noone AM, Krapcho M, Garshell J, Miller D, Altekruse SF, et al.,
- editors. SEER Cancer Statistics Review, 1975-2011. Bethesda, MD: National Cancer Institute. Based on November 2013 SEER Data Submission, Posted to the SEER. Available from: http://www.seer.cancer.gov/csr/1975\_2011/. [Last accessed on 2014 Apr 12]
- Rathi A.K., Kumar S., Ashu A., Singh K. and Bahadur A.K. Epidemiology of pediatric tumors at a teriary care centre. Indian J Med Paediatr Oncol. 2007; 28(2): 33-5.
- Kumar V, Fausto N, Abbas A. Pathologic basis of disease, Elsevier; 7th edition; 2004.
- Saini M., Barman M.L., Ghanghoriya P., Agarwal G.and Singhothiya L. Pattern of childhood Malignancy in Central India: A Three Years Retrospective Study.EJPMR2017;4(5):467-471.
- Bhalodia Jignasa N, Patel Mandakini M. profile of pediatric malignancy: A three Year study. National journal Community Medicine 2011; 2(1):24-27.
- Nagaraja1CT, Patil BR, Ugrappa G, Krishnamurthy R. Solid Malignant Tumors of Infancy and Childhood: A Histopathological Study. Sch. J. App. Med. Sci., 2015; 3(1C):167-174.
- Gupta N , Monika Choudhary, Sandeep Pachar, Jaiprakash Dhaka, Roshan Verma. Solid malignant pediatric tumors: a histopathological study Int J Contemp Pediatr. 2017 Mar: 4(2): 442-446.
- Sharma N. Avesha Ahmad, Gull M Bhat, Sheikh A Aziz, Mohammad Maabool Lone, Nisar A Bhat. A Profile of Pediatric Solid Tumors: A Single Institution Experience in Kashmir. Indian Journal of Medical and Paediatric Oncology 2017;38:471-477.
- Jan M, Ahmad S, Rashid I, Quyoom S, Rashid T. Pattern and clinical profile of childhood malignancies in Kashmir India. JK- Practitioner January-June 2015:20 (1-2):12-16.
- Wani LA, Farooq S, Beigh A, Khuroo M, Abass F. Histopathological pattern of solid malignant pediatric tumors in Kashmir, India. Int J Contemp Pediatr. 2018 May; 5(3):1087-1091.
- Jahan F, Kamal M, Sultana S. Pattern of Paediatric Brain Tumours Evaluated in BSMMU, Dhaka, Bangladesh. Bangladesh J Child Health 2013; VOL 37 (3):

- 16. Banerjee CK, Walia BNS. Pattern of neoplasms in childhood. Indian J Paediatr. 1986;53:93-7.
- Venugopal KV, Joseph TP, Verma KK. Solid malignant tumor of infancy and childhood: a clinicopathological study. Ind Pediatr. 1981;18(6):365-8.
  Sharma S, Nath P, Srivastava AN, Singh KM. Wilms' tumour: a clinicopathologic study with special reference to its morphological variants. Indian J Pathol Microbiol. 1995;38(1):55-62.