Clinicopathological Profile of Childhood Primary Abdominal Tumours in Kashmir

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Abstract Primary abdominal tumours attract considerable notice because of their serious prognosis, high cost of treatment and the emotional and psychological trauma. Abdominal tumours can present with pain, vomiting, constipation or less commonly intestinal obstruction. The presentation of cancer in children mimic those of childhood conditions like infections particularly viral infections, urinary tract infections, gastro-oesophageal reflux, malnutrition, constipation, lymphadenitis, glomerulonephritis and congenital urinary tract anomalies.

Keywords Primary childhood abdominal tumour · Wilms' tumour · Neuroblastoma

Introduction

Primary abdominal tumours, though relatively rare in children, attract considerable notice because of their serious prognosis, high cost of treatment and the emotional and

psychological trauma, both to the parents and the patients. It is estimated that a child has 1:500 chances of developing cancer during the first 15 years of life [1].

Although cancer remains the leading cause of death, barring malnutrition and infection (for children 14 years of age and younger) [2], the past quarter century has seen remarkable advances in treatment, resulting in the survival of more than two thirds of these children.

Childhood cancer incidence varies throughout the world. This may be related, in part, to fundamental issues of biology and demographics. It can also be related to the reporting system of a country and its level of economic development.

Abdominal tumours can present with pain, vomiting, constipation or less commonly with intestinal obstruction. It is not unusual for a child to present with an abdominal mass because a family member notices a protuberant mass. The presentation of cancer in children mimics those of childhood conditions such as infections, particularly viral infections, urinary tract infections, gastro-oesophageal reflux, malnutrition, constipation, lymphadenitis, glomerulonephritis and congenital urinary tract anomalies. Therefore, deciding whether a child requires further investigation can be challenging [3].

Earlier, the diagnostic methods to identify these tumours at the primary stage or localising their site of origin were very disappointing. Nowadays, recent advances in diagnostic methods and the application of vigorous multidisciplinary treatment policies by special units combining expert paediatric surgery, radiotherapy and multidrug chemotherapy regimens have made marked improvement in treating primary abdominal tumours of childhood, because if diagnosed earlier, these tumours are more responsive to treatment, resulting in good survival and prognosis [4].

Tumour histology has been found to predict outcome; therefore, the importance of pathological evaluation of tumour tissue cannot be overlooked. In every tumour that has

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Table 1 Distribution of patients with primary abdominal tumours in paediatric age group in our study

Sample no.	Type of tumour	Number of patients	Male	Female
1	Wilms' tumour	25	18	7
2	Neuroblastoma	9	6	3
3	Non-Hodgkin's lymphoma	16	12	4
4	Hodgkin's lymphoma	4	2	2
5	Soft tissue sarcoma (rhabdomyosarcoma)	4	2	2
6	Hepatocellular carcinoma	2	2	–
7	Teratoma	2	–	2
8	Teratocarcinoma	2	–	2
	Grand total	64	42	22

been studied in detail, it has been observed that the DNA of a tumour cell is not the same as DNA of non-malignant cells. Tumour cell DNA has undergone one or more point mutations, deletions, insertions, amplification or translocation that alters, eliminates or disregulates one or more genes involved in growth or development of the transformed cell [1].

Material and Methods

This work was undertaken to study the clinicopathological profile of primary abdominal tumours in children who presented in the outpatient department of paediatric surgical division of our hospital, from May 2005 to April 2008.

Results

A total of 64 patients with primary abdominal tumours in paediatric age group were admitted in our paediatric surgery unit of surgery department, over a period of 3 years from May 2005 to April 2008. Study was a prospective one, and all patients admitted were studied in detail. The frequency of different paediatric tumours are summarised in Table 1.

Majority of the patients had Wilms' tumour followed by non-Hodgkin's lymphoma (NHL) and neuroblastoma.

Hodgkin's disease and soft tissue sarcoma were less prevalent, whereas hepatocellular carcinoma (HCC), teratoma and teratocarcinoma were rare.

In our study of 64 patients, 42 were males and 22 were females. From Table 2, it is evident that the majority of patients were 4–6 years of age. The patients with Wilms' tumour presented in early age, whereas patients with NHL and HCC presented above 4 years of age.

Neuroblastoma also had its peak incidence in the age group of 2–6 years. NHL had its maximal incidence in the age group of 4–6 years (Table 2). Anaemia was present in a large percentage of patients and was the predominant finding on routine haematological investigation (Table 3). As is evident from Table 4, patients with Wilms' tumour presented with swelling in the abdomen and flank, which was ballotable.

Patients with NHL, teratoma and teratocarcinoma presented with swelling in the abdomen, which usually does not involve the flank and is not ballotable. Patients with HCC presented classically with hepatomegaly.

The abdominal lumps palpated in the majority of our patients were nontender with other variably associated physical abdominal findings such as flank fullness; shifted umbilicus was also seen in few patients.

Abdominal mass was present in all of the patients with soft tissue sarcoma accompanied with abdominal pain,

Table 2 Age distribution of primary abdominal tumours in paediatric age group in our series of 64 patients

Age in years	Wilms' tumour (n=25)	Neuroblastoma (n=9)	Non-Hodgkin's lymphoma (n=16)	Hodgkin's disease (n=4)	Soft tissue sarcoma (n=4)	HCC (n=2)	Teratoma (n=2)	Teratocarcinoma (n=2)
0–2	6	3	–	–	–	–	1	–
2–4	8	3	–	–	2	–	1	2
4–6	8	2	6	2	1	–	–	–
6–8	3	1	2	2	–	–	–	–
8–10	–	–	2	–	–	–	–	–
10–12	–	–	2	–	1	–	–	–
12–14	–	–	4	–	–	2	–	–

Table 3 Incidence of physical signs in 64 cases of primary abdominal tumours in our study

Physical sign	Wilms' tumour (n=25)	Neuroblastoma (n=9)	NHL (n=16)	Hodgkin's disease (n=4)	Soft tissue sarcoma (n=4)	HCC (n=2)	Teratoma (n=2)	Teratocarcinoma (n=2)
Pallor	06	07	07	04	03	02	01	02
Jaundice	02	—	—	02	—	02	—	01
Oedema	02	01	—	02	—	01	—	—
Cervical LAP	—	—	04	04	—	—	—	—
Axillary LAP	—	—	03	04	—	—	—	—
Inguinal LAP	—	—	03	—	01	—	—	—
CVS Abnormality	—	—	—	—	—	—	—	—
CNS abnormality	—	—	—	—	—	—	—	—

LAP lymphadenopathy, CVS cardiovascular system, CNS central nervous system

fever, vomiting, weight loss, anaemia and breathlessness in varied distribution. Two children with diagnosis of teratoma presented with abdominal mass, abdominal pain, vomiting and constipation.

Discussion

Paediatric tumours form a small proportion of all cancers; however, they are important in understanding the importance of neoplastic growth and evolution of cancer therapy, and its social impact is much more than anticipated; besides, it results in the loss of many more productive years of life, arousing poignant sympathy.

In our study of 64 patients, majority of the patients had Wilms' tumour followed by NHL and neuroblastoma. Hodgkin's disease and soft tissue sarcoma were less prevalent, whereas HCC, teratoma and teratocarcinoma were rare.

This is in accordance with the incidences reported in data collected by Surveillance Epidemiology and End Result Programme of National Cancer Institute between 1973 and 1999 and by International Classification of Childhood

Cancer group for 0–19 years old [5]. But we have only studied patients in the age group of 0 to 15 years.

In our study of 64 patients, 42 patients were males (65.62 %), whereas 22 patients (34.32 %) were females, which brings a male–female ratio of 1.9:1, which is in accordance with a previously published data [5].

It is evident from our study (Table 2) that the majority of patients were below 6 years of age. In series by Sharif et al. [6], majority (93.33 %) of retroperitoneal tumours occurred in the first 5 years of life. Rai and Moazam [7] also reported the majority (60.3 %) of malignant abdominal tumours to occur under 5 years of life.

Patients with Wilms' tumour presented in early age, whereas NHL and HCC were found to occur in children above 4 years of age. Sharif et al. [6] reported the mean age of Wilms' tumour as 3 years. In another study, median age of Wilms' tumour is reported to be around 2.5 years [8]. Another study reflects the mean age to be 3.5 years for Wilms' tumour [9].

Neuroblastoma also had its peak incidence in the age group of 2–6 years. NHL had its maximal incidence in the age group of 4–6 years.

Table 4 Findings on local abdominal examination in 64 patients of primary abdominal tumours in our study

Physical sign	Wilms' tumour (n=25)	Neuroblastoma (n=9)	NHL (n=16)	Hodgkin's disease (n=4)	Soft tissue sarcoma (n=4)	HCC (n=2)	Teratoma (n=2)	Teratocarcinoma (n=2)
Distention	23	9	10	—	2	2	2	2
Visible lump	23	9	8	4	4	2	2	1
Flank fullness	23	5	—	—	—	—	—	—
Umbilical shift	3	2	—	—	—	—	—	—
Tenderness	2	—	6	—	—	1	—	—
Ballotability	15	—	—	—	—	—	—	—
Splenomegaly	—	—	4	4	—	—	—	—
Ascites	3	2	—	3	—	—	—	—
Hepatomegaly	3	—	4	2	—	2	—	—

Males constituted a majority in almost all the categories of patients studied. In many of the studies, males have been seen to outnumber females in the incidence of primary abdominal tumours [6, 9].

All the patients with Wilms' tumour presented with a cardinal symptom of progressive distention of the abdomen with abdominal pain, haematuria, fever, malaise and weight loss, following in decreasing order of incidence. The manifestation with advanced tumours included haemoptysis, hypertension and ascites.

Majority of the patients in our study presented with abdominal mass (Table 4). Wilms' tumour has been reported to present as asymptomatic abdominal mass [10].

Abdominal swelling was present in all of patients with neuroblastoma accompanied with abdominal pain, vomiting, fever, pallor, failure to gain weight, easy fatigability, loss of appetite, breathlessness, bladder and bowel dysfunction and diarrhoea. Neuroblastoma has been reported to appear typically as abdominal mass in young children [10].

Intestinal obstruction was the presenting feature in 62.5 % of cases of abdominal NHL, accompanied with symptoms such as abdominal pain, fever, generalise weakness, vomiting, anorexia and loss of weight. Two children with diagnosis of HCC presented with vague upper abdominal pain, abdominal swelling with intermittent fever and anorexia lethargy and jaundice.

Conclusion

Abdominal tumours in children can frequently mimic many of the other common childhood conditions, and thus can be

very challenging. It, therefore, becomes exceedingly important for the paediatricians and the primary care physicians to have a high degree of suspicion and proper referral of suspected cases to higher oncology centres.

References

1. Oldham KT, Colombani PM, Foglia RP (1997) Surgery of infants and children: scientific principles and practice, Lippincott-Raven, Philadelphia. p. 537–548, 549–565
2. Ghai OP, Gupta P, Paul VK (2000) Malignancies in childhood, Essential Paediatrics, 5th edn. p 462–474
3. Guy Y, Jeffrey AT et al (2000) Recognition of common childhood malignancies. *Am Fam Physician* 61(7):2144–2151
4. Exelby PR, Filler RM, Grosfeld JL (1975) Liver tumors in children in the particular reference to hepatoblastoma and hepatocellular carcinoma: American Academy of Paediatric Surgical Section Survey—1974. *J Ped Surgery* 10:329–337
5. Halperin EC (2005) The cancer problem in children. In: Halperin EC, Constine LS, Tarbell NJ, Kun ED (eds) *Pediatric Radiation Oncology*, 4th edn. Lippincott, Williams and Wilkins, Philadelphia
6. Sharif M, Farooq U, Mumtaz F, Raza MN (2007) Retroperitoneal tumours in children—experience at Mayo Hospital, Lahore. *Pak J Med Health Sci* 1(1):11–13
7. Rai AT, Moazam F (1996) Malignant abdominal tumours in children. *JPMA* 8:168–171
8. Mulhim IA (1997) Wilms' tumour in children: a 10 years experience from Eastern Province of Saudi Arabia. *Saudi Kidney Dis Transplant* 8(2):123–126
9. Ko YS, Lin LH, Chen DF (1995) Abdominal teratomas in children. *Zonghua Min Guo Xiao Er Ke Yi Xue Hui Za Zhi* 36(5):342–345
10. Hayes FA, Smith EI (1989) Neuroblastoma. In: Pizzo PA, Poplack DG (eds) *Principle and practice of pediatric oncology*. Lippincott, Philadelphia, pp 607–622