

Original Research Article

# Abdominal masses in Pediatric age

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	International Archives of Integrated Medicine, Vol. 4, Issue 6, June, 2017. Copy right © 2017, IAIM, All Rights Reserved. Available online at <a href="http://iaimjournal.com/">http://iaimjournal.com/</a>	
	ISSN: 2394-0026 (P)	ISSN: 2394-0034 (O)
	Received on: 05-05-2017	Accepted on: 13-05-2017
	Source of support: Nil	Conflict of interest: None declared.
<b>How to cite this article:</b> Moka Jagan Mohan, Thatipamula Anil Balraj, Tanuja K.D.B.S. Abdominal masses in Pediatric age. IAIM, 2017; 4(6): 8-12.		

## Abstract

**Background:** Abdominal masses are often incidentally discovered by a parent while bathing the child, palpated unexpectedly on routine physical examination, or detected on abdominal imaging.

**Aim:** The objective of the present study was to observe intra-abdominal tumors in children less than 12 year.

**Materials and methods:** Total 17 intra-abdominal tumors of both sexes under 12 years of age was collected and analyzes to determine the various types of intra-abdominal tumors in relation to age and sex. Study was done for a period of 4 years.

**Results:** 1 to 5 years are more common pediatric age group with tumors in abdomen with 52.7%. Age under 5 years age group with 70.6%. Males are most commonly observed with pediatric tumors with 58.8% of total subjects. Male: female ratio is 1.2:1. Neuroblastoma was the most common tumor constituting 41.18 % of all cases, followed by Wilms' tumor (23.53%), hepatoblastoma (11.76%), teratoma and granulosa cell tumor (11.76%).

**Conclusion:** Neuroblastoma was the most common tumor. Most of the tumors were noted in children less than 5 years of age.

## Key words

Pediatric age, Intra-abdominal tumors, Neuroblastoma.

## **Introduction**

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The commonest cause for a lump may be a tumour that may or may not be malignant. Yes, the notion that cancers can only occur in old persons is wrong and cancers of various organs in children are a distinct possibility - known as embryonal cancers and are present in a small size since before birth. These cancers continue to grow after birth and the later they are noticed or investigated for - the larger and more difficult it is to treat them. Not all lumps are cancerous, some are benign lumps and may grow slowly till they are treated. Besides solid organs like the kidneys, liver, adrenal glands, even intestinal tract may be affected by solid or cystic masses. The effect of the lump may depend on where they are situated, how fast they grow, and can cause pain, obstruction of the intestinal tract, the urinary tract and so on. The mass can cause external pressure on any tubular organ like the intestine, the ureter, the bile duct and block it causing a build up of pressure proximal to the site of obstruction. Cancer of organs can spread locally and engulf important large blood vessels, grow into the wall of the vessel, intestine or tubular structure. The tumor can also spread through the blood stream to other organs in the abdomen or outside the abdomen - these are called metastasis. The reason for writing these details is to emphasize the importance of early diagnosis, thorough investigations, ideal therapy that may include surgery, chemotherapy (anti-cancer drugs), and radiation therapy. With proper care and a prolonged follow up, it is possible to give good results. However, delay in diagnosis, and therapy can increase both the mortality and the morbidity due to the mass [1].

Accidents are still the greatest cause of death in children, and the second cause of death is benign and malignant tumors. During the past 15 years there has been a dramatic decrease in the death rate in infants and children from infectious diseases, so that today the juvenile population has increased [2]. With this increase, the number of infants and children having an abdominal mass is potentially increased. The majority of

abdominal masses in this age group are of congenital origin, and the time. Finding an abdominal mass on a child can be alarming to both the parents and pediatrician. Abdominal masses are often incidentally discovered by a parent while bathing the child, palpated unexpectedly on routine physical examination, or detected on abdominal imaging. The causes of pediatric abdominal masses are extensive, ranging from benign to neoplastic, and often originating from organs within the intra-abdominal cavity. At presentation, patients may be asymptomatic or report a wide range of associated symptoms, including fever, hematuria, and abdominal pain or distension. New-onset hypertension may be the first sign of an abdominal mass. The child's age, associated symptoms, location of mass, and laboratory findings provide important clues to the underlying cause and can direct appropriate evaluation and consultation. On review of literature [3, 4, 5] done on pediatric malignancies in other areas but not in this local areas, Hence this study done to know incidence of various pediatric malignancies in this area.

## **Materials and methods**

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The prospective observational study carried out at the Department Of Paediatric Surgery, Kakatiya Medical College, Warangal, during a period of 4 years, from March 2012 to March 2016. Total 17 intra-abdominal tumors of both sexes under 12 years of age was collected and analyzes to determine the various types of intra-abdominal tumors in relation to age and sex.

The mother has noticed the child's abdomen was different upon bathing and diagnosed mass by proper history with a focused gastrointestinal physical examination and proper diagnostic tests by right specialist to refer too (i.e. pediatric oncologist, surgeon, gastroenterologist, nephrologists, or gynecologist).

## **Results**

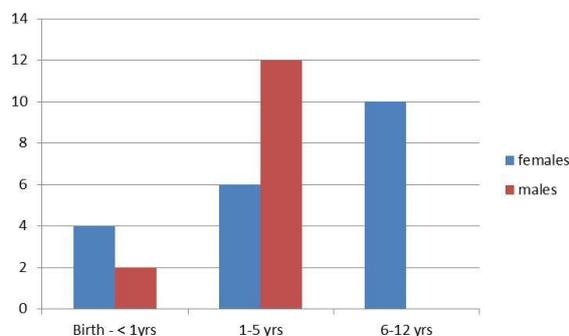
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1 to 5 years were more common pediatric age group with tumors in abdomen with 52.7%. Age under 5 years age group with 70.6% (Table – 1). Males were most commonly observed with pediatric tumors with 58.8% of total subjects. Male: female ratio was 1.2:1 (Figure – 1). Neuroblastoma was the most common tumor constituting 41.18 % of all cases, followed by Wilms'tumor (23.53%), hepatoblastoma (11.76), teratoma and granulosa cell tumor (11.76%) as per Table - 2. Out of 17 children 24 (70.6%) were with abdominal tumours and 26(76.5%) children were without tumour from birth. Total excision of tumour was done in 11(64.7%) in management of tumor (Table – 3).

**Table - 1:** Demographic details of study.

Age of the patient	No of subjects	%
Birth - < 1yrs	3	17.7
1-5 yrs	9	52.9
6-12 yrs	5	29.4
<b>Total</b>	<b>17</b>	<b>100</b>

**Figure - 1:** Bar diagram showing gender distribution in study.



**Table - 2:** Type of tumour in study.

Type of tumour	No of subjects	%
Neuroblastoma	7	41.18
Wilms'tumor	4	23.53
Hepatoblastoma	2	11.76
Teratoma and granulosa cell tumor	2	11.76
Lymphangioma	1	5.88
Mesentric Cyst	1	5.88
	<b>17</b>	<b>100</b>

**Table - 3:** Site, duration and management in study.

Site of Tumour	No of Patients	%
Abdominal Tumours	12	70.6
Extra Abdominal	5	29.4
Duration of Tumor		
Present Since Birth	4	23.5
Not Since Birth	13	76.5
Management of Tumour		
Total Excision	11	64.7
Subtotal Excision	6	35.3

### Discussion

The evaluation of a child with an abdominal mass involves a number of considerations, and the possibilities considered depend to some extent on the age and sex of the patient, the location of the mass, and the presence or absence of other potentially related signs and symptoms, as well as features of the physical examination. The abdominal mass in an infant or child is most commonly an incidental finding first observed by a parent or at the time of a pediatric screening examination. Over 50% of abdominal masses detected by physical examination are actually cases of organomegaly. The remaining 43% of masses require surgical evaluation and comprise neoplasms, developmental anomalies, and inflammatory or infectious disease. Ninety percent of this group are retroperitoneal masses, approximately half of which derive from the urinary tract.

Most of the patients are under age 5 years of age group with 70.6% which is in agreement with other studies [6]. Males are most commonly with 58.8% of total subjects with ration of male: female ratio of 1.2: 1. Similar findings were observed by Hanif G, et al. [7] in the study "Intra-abdominal tumors in children" in 2004 in which majority of the cases were in the age group below 5 years with male to female ratio of 1.1 : 0.9.

Neuroblastoma was the most common tumor constituting 41.18% of all cases, followed by Wilms'tumor (23.53%), hepatoblastoma (11.76),

teratoma and granulosa cell tumor (11.76%). Blevrakis E, et al. [8] study also had same observations. Similar findings were observed by Armand E. Brodeur, et al. [9] in the study "Abdominal masses in Children: Neuroblastoma, Wilms tumor and other considerations" in which majority of intra-abdominal masses. Neuroblastoma can arise anywhere along the sympathetic nervous system. Symptoms at diagnosis are specific to the particular site at which the tumor develops. More than half will occur in the retroperitoneal area, arising from the adrenal gland. These children experience abdominal pain and have a palpable, firm, nontender abdominal mass that may cross the midline. Other primary sites of disease include the head, neck, mediastinum, and pelvis. Orbital disease causes proptosis and periorbital ecchymosis, and can lead to impaired vision if not treated promptly. Primary tumors in the neck can compress the airway and restrict or impair breathing. Tumors that arise along the spine can grow into the intervertebral foramina and cause spinal cord compression. Cord involvement can progress rapidly and lead to irreversible paralysis. Signs such as numbness, tingling, or incontinence are serious and indicate an oncologic emergency that requires immediate intervention [10].

Sites of metastasis include the bone, bone marrow, liver, lungs, brain, and soft tissue. Bony metastasis causes pain, and if the legs are involved the child may refuse to bear weight. Other bony tumors may appear on the skull, and be nontender, fixed, and bluish in color. Tumor cells that infiltrate the bone marrow crowd out the normal hematopoietic cells and may cause anemia, thrombocytopenia, and/or neutropenia. Metastatic tumors in the brain may cause focal neurologic signs or seizures. Children who have localized disease, and those who have complete response to treatment after initial therapy are much more likely to achieve a disease-free state and long-term survival. Those over 1 year of age who have widely metastatic disease at diagnosis or unfavorable histologic markers, or those who relapse shortly after completing therapy, have a

more dismal outcome [11, 12]. Early recognition and multimodality therapy is essential to achieve these survival rates. General practitioners, family physicians and pediatricians must be made aware of the significance of an abdominal mass in the child; the high potential for malignancy in these masses and early referral to institutions best equipped to provide multimodality therapy.

## Conclusion

The neonate, infant, or child with an abdominal mass needs rapid clinical evaluation. Age, history, and physical examination provide initial guideposts to diagnosis. If the initial evaluation indicates possible malignancy, more complex testing of blood, bone marrow, serum chemistries, and urine may be required. Outcome varies widely depending on the malignant or benign nature of the existing mass but is generally more favourable in neonates.

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