Original Article

Etiological Assessment of Splenomegaly by Clinical and Laboratory Methods in Paediatric Age Group (3 Months To 18 Years)

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Abstract

Introduction: Splenomegaly is the enlargement of spleen. Splenomegaly is a sign seen in various disease processes in infants and children. So, an attempt was made in the present study to know the various etiological factors and clinical features and clinical outcome of splenomegaly in the cases admitted in Prathima institute of medical sciences, Nagunoor, Karimnagar

Aim and objectives: 1. To establish the possible etiology of Splenomegaly in children by clinical and laboratory methods

Material and methods: 100 children from 3 months to 18years, with varying grades of Splenomegaly of different etiologies, admitted to paediatric wards of Prathima Institute of Medical Sciences, Karimnagar were studied in this observational study between Decembers 2015 to November 2017. Detailed study of each case including history, thorough physical examination and necessary investigations were done to reach the diagnosis.

Results: Male preponderance was seen in present study. Maximum incidence of Splenomegaly was seen between 3 months to 6 years age group (62%). Majority of the cases had moderate Splenomegaly (62%). Fever was the most common presenting feature associated with Splenomegaly. Hepatomegaly was the most common association with Splenomegaly. Infections (42%) were the most common cause of Splenomegaly, followed by hematologic (25%) causes.

Conclusions: Infections was the most common cause of Splenomegaly in present study. Male preponderance was seen; majority of cases had moderate Splenomegaly and belonged to preschool age group.

Keywords- Fever, Splenomegaly, Hepatomegaly, Infection

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Introduction

The spleen is an important organ of the immune system, with lymphoid, reticuloendothelial and vascular components. Disturbance of any of these may cause splenomegaly.[1] Splenomegaly is defined as enlargement of the spleen measured by size or weight. The spleen plays a significant role in haematopoiesis and immune surveillance. The major functions of the spleen include clearance of abnormal erythrocytes, removal of microorganisms and antigens as well as the synthesis of immunoglobulin G (IgG). Splenomegaly may be a transient condition due to acute illness or may be due to serious underlying acute or chronic pathology[2] Splenomegaly is one of the most common clinical findings in our country, especially in infants and children. It may be normally found in 15% of neonates, 10% of normal children and 5% of adolescents[3].The tip of the spleen is palpable in most prematureinfants[1]. The spleen in infants and children is commonly involved in a variety of pathologic processes. Some of these processes cause isolated splenic disease where as others involve the spleen as a part of a systemic illness[3]. Causes of Splenomegaly vary from area to area and period to period. The commonest diseases associated with Splenomegaly were hematologic (lymphoma), hepatic (chronic liver disease), infectious diseases (AIDS and endocarditis), congestive (CCF), primary splenic (splenic vein thrombosis) and others (malignancy).[4] In the present study, an attempt had been made to find out the causes of Splenomegaly in children in a medical college hospital setting.

Aim and Objectives

1. To establish the possible etiology of Splenomegaly in children by clinical and laboratory methods.
2. To study the incidence of Splenomegaly in various age groups and to assess age incidence in each etiological group.
3. To study the incidence of Splenomegaly in different sex groups.
4. To study the signs and symptoms associated with Splenomegaly
5. To study the various grades of enlargement of spleen and their incidence in each etiological group.

Materials and Methods

Study Design: Hospital based prospective observational study

Study Sample Size: 100

Study Population: Children with Splenomegaly in age group from 3 months to 18 years attending the wards and PICU of Prathima Institute of Medical Sciences with varying degree of Splenomegaly of different etiology

Study centre: The study was conducted in the Department of Paediatrics of Prathima Institute of Medical Sciences, Nagunoor, Karimnagar.

Study period: 18 months (December 2015–November 2017)

Inclusion Criteria:

- Children in the age group of 3 months to 18 years with splenomegaly.
- Parents/guardians of children who are willing to give informed consent.

Exclusion criteria:

- Children with pushed down spleen that is palpable due to lung pathologies
- Spleen palpable as a result of visceroptosis
- Parents or guardians those who are not willing to give informed consent.

Method

On admission, informed consent was taken from the parents/ guardians of the children and detailed study of each case including history, through physical examination and necessary investigations within the limitations of the available laboratory facilities were done depending up on the history and clinical findings. Cases were analysed to evaluate the following data:

1. Age incidence
2. Sex incidence
3. Signs and symptoms
4. Grades of enlargement
5. Etiology
6. Age incidence in each etiological group
7. Grades of enlargement in each etiological group

Routine investigations like complete blood count, peripheral smear, urine and stool analysis, chest X-ray, Mantoux test were done initially. Relevant investigations like Widal test, HIV, VDRL, liver function test, bone marrow examination, bleeding time and clotting time, Hb electrophoresis, X-ray skull, Xray wrist, barium swallow for oesophageal raises, blood group, blood culture was done in relevant cases, depending up on the provisional diagnosis made on history and clinical examination. Special investigations like CT scan, sickling test osmotic fragility test was done in few cases where as indicated. Though history and physical examination provide clues for diagnosis, final diagnosis could be confirmed only after investigations.

Institutional ethical committee approval:

Ethical clearance was obtained from the Institutional Ethical Committee, Prathima Institute of Medical Sciences, Karimnagar.

Results

Highest incidence of Splenomegaly was seen in 0-6years age group (62%) followed by 27% in 7-12 years age group followed by 11% in 13-18years age group.

Male preponderance was seen in present study accounting for 67% of cases.

Fever was the most common presenting symptom accounting for 67% of cases followed by cough (20%). Hepatomegaly was the most common presenting sign accounting for 78% followed by anaemia in 55% of cases.

Highest incidence was seen in moderate Splenomegaly group (4-7cms) accounting for 62% followed by 23% in marked Splenomegaly group (>7cm) followed by15% in mild Splenomegaly group (1-3cms).

In this study, infectious disorders formed the most common etiologic agent accounting for 42% of cases of Splenomegaly followed by hematologic disorders in 25%, figure 1 shows the etiological analysis of the present study.

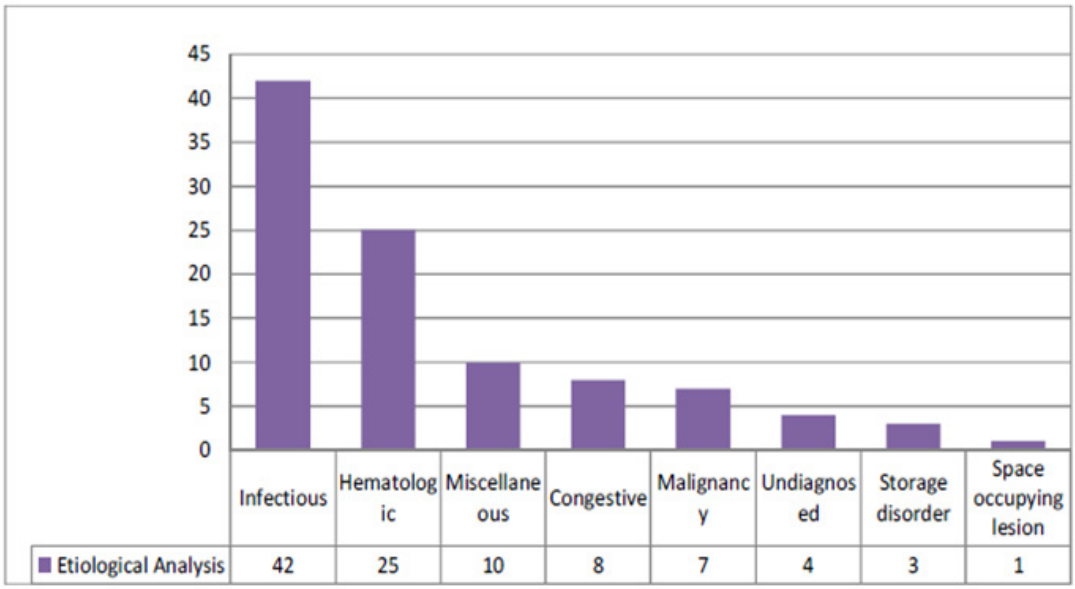

Figure 1: Graph showing Etiological groups of 100 Cases

In 3 months-6 years and 7-12 years age group, majority of cases of Splenomegaly were caused by infections, accounting for 37% (23 out of 62 cases) and 59% (16 out of 27 cases) respectively, whereas in 13-18 years age group, hematologic etiology was common accounting for 36% (4 out of 11cases), figure 2 represents a graph showing the etiology is specific age groups.

Mild and moderate Splenomegaly was seen commonly in infectious etiology group accounting for 66% (10 out of 15cases) and 45 % (28 out of 62 cases) respectively. Massive Splenomegaly was seen

commonly in congestive Splenomegaly group 21% (5 out of 23 cases) followed by infectious etiology 17% (4 out of 23 cases).

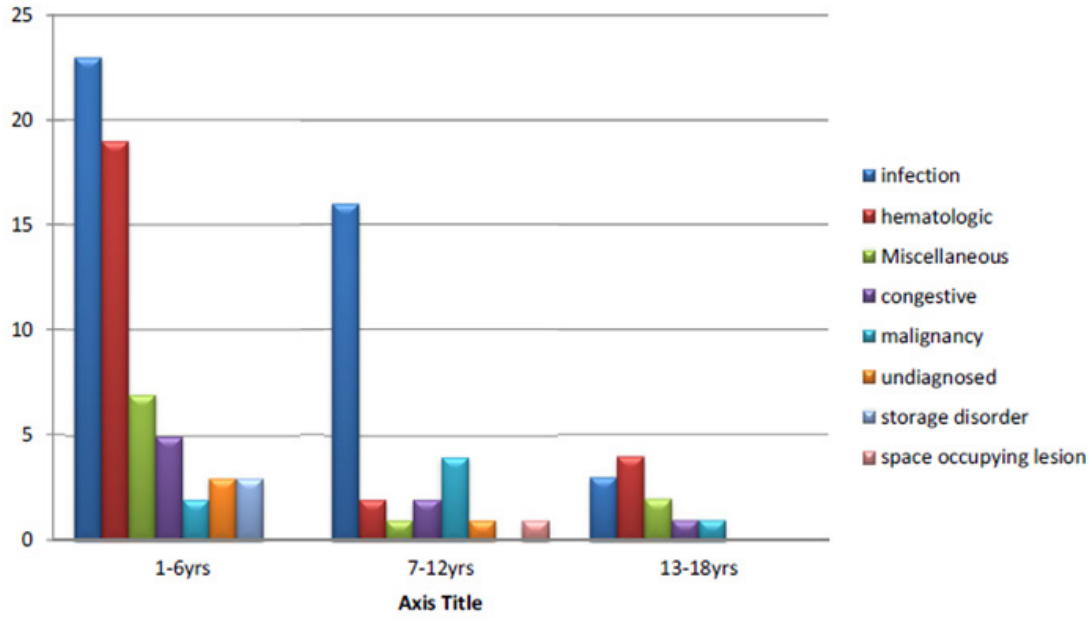

Figure 2: Graph showing age incidence in each etiological group

Discussion

Splenomegaly is a common clinical finding in paediatric practice. Splenomegaly is not a disease but a sign seen in various diseases. Hundred cases of varying grades of Splenomegaly of different etiologies in paediatric age group were studied in paediatric wards of Prathima institute of medical sciences, Karimnagar. Etiological analysis was done by history, clinical examination and available laboratory facilities in the hospital. Splenomegaly was studied between three months to eighteen years. Maximum incidence was found in first age group of 3m-6 years i.e.,62% followed by 27% in 7-12 years age group, followed by 11%, in 13-18 years age group. Males are affected more often than females. Splenomegaly was seen in 67% of males compared to 33% of females. Splenomegaly was classified in to three grades on clinical grounds[5]. In present study, 15% belonged to mild Splenomegaly (1-3Cms) group, 62% belonged to moderate Splenomegaly (4-7Cms) group, whereas 23% belonged to marked Splenomegaly group (>7 cms). None of our cases had massive Splenomegaly that is reaching beyond umbilicus.

Because of the multiplicity of factors responsible for Splenomegaly in tropics, more than one pathology contributes to an increase in splenic size in a particular patient.6 Commonest cause of mild Splenomegaly in this study was infections disorders, accounting for 66.66% of cases of mild Splenomegaly group. Commonest cause of moderate Splenomegaly was also found to be infections disorders, accounting for 45.16% of moderate Splenomegaly cases, followed by hematologic disorders. Commonest cause of massive Splenomegaly was found to be congestive disorders in present study, accounting for 21.73% of cases of massive Splenomegaly group. Commonest cause of Splenomegaly in 3m- 6 years and 7-12 years age group was of infections origin accounting for 37.09% and 59.25% respectively. Commonest cause of Splenomegaly in 13-18 years age group was hematologic comprising 36.36% of cases in this age group. Fever was the most common presenting feature in present study associated with Splenomegaly followed by cough, swelling of the face or feet, jaundice, breathlessness, pain in abdomen, distension of abdomen, vomiting, mass in abdomen, rash, failure to thrive and bleeding in decreasing order of frequency. In a study from Brazil, fever, pallor, weight loss and jaundice were the most common presenting symptoms.[7] Most studies quote that the fever is the most common presenting symptom associated with Splenomegaly.7,8,9,10 A study on

Hepatosplenomegaly and anaemia also observed that fever was the most common presenting symptom followed by abdominal distension, pallor, failure to thrive, edema, dyspnoea and jaundice.11 The most common sign associated with Splenomegaly was Hepatomegaly accounting for 78%of cases followed by anaemia (55%) and then lymphadenopathy (36%).

Table 1: Observed results compared to other studies

	Infections	Hematologic	Miscellaneous	Congestive	Malignancy	Undiagnosed	Storage disorder	Space Occupying lesions
Champatiray	50%	36%	4%	6%	8.1%	%	1.3%	-
Somaiah	68%	22.67	3.3%	2%	-	-	2%	-
Ali N	-	73%	-	-	18%	-	9%	-
Present Study	42%	25%	10%	8%	7%	4%	3%	1%

Infections (42%) were the most common cause of Splenomegaly in present study followed by hematologic (25%), miscellaneous (10%), congestive (8%), malignancy (7%), undiagnosed (4%), storage disorder (3%) and space occupying lesion (1%) of cases in decreasing order of frequency. Among infections, enteric fever was the most common etiology accounting for 7% of cases followed by malaria (5%). Among hematologic disorders, Thalassemia was the most commonly encountered disorder accounting for 7% of cases, followed by megaloblastic anaemia. Among the congestive disorders, portal hypertension secondary to cirrhosis (6%) was the most commonly encountered disorder. Among the malignant group of disorders, acute myeloid leukaemia (3%) was most commonly encountered followed by acute lymphoblastic leukaemia (2%) and hepatoblastoma (2%).

In Somaiah study, 68% of cases showed infectious etiology forming the most common cause of Hepatosplenomegaly in children. In the infectious group, 29.33% were due to Malaria, 13.33% were of Enteric Fever, 11.33% were due to Viral Hepatitis, 6.67% due to Tuberculosis, 4.67% due to Dengue fever, 2.67% are due to Septicemia.[12] In champatiray study, infections were the most common cause of Splenomegaly constituting 50% of the cases of which Malaria was most common.[13] In this study, to conclude infections group compromised 42 % of children with Splenomegaly whereas it was 50% in champatiray and 68% in somaiah study. Second common group in present study was hematologic compromising 25% of children which was almost similar to the study by somaiah i.e., 22.67% and was less compared to the study by Ali N. from Pakistan. Miscellaneous group compromised 10% in this study, where as it was 3.3% in study by Somaiah study. Congestive group compromised 8% in this study which was more compared to the study of Somaiah which had 2%, Reddy Y.R and friends in their study showed that mild Splenomegaly accounted for 57% of cases followed by moderate in 32% of cases, marked in 6% of cases and massive Splenomegaly in 5% of the cases[8]. Table 1 shows the results of the above-mentioned studies and the results of the present study to compare.

Diagnosis in every case was confirmed by routine, relevant and if required special investigations. USG abdomen's abdomen was done in all the cases to confirm the grade of Splenomegaly detected by

clinical examination. Treatment was directed towards the primary cause of Splenomegaly. Surgery if was advised wherever required like portacaval shunts in portal hypertension, excision in hepatoblastoma and Hydatid cyst.

Conclusion

Most of the cases was seen in 3 months-6 years age group (62%) and male preponderance (62%) was seen in present study. Moderate Splenomegaly (4-7Cms) was the most common in present study (62%). Commonest cause of moderate Splenomegaly was infectious disorders (45.16%) followed by Hematologic disorders (30.6%). Commonest cause of mild Splenomegaly was infections disorders (66.66%). Among infections, enteric fever was the most common etiology accounting for 7% of cases followed by malaria (5%).

Commonest cause of Splenomegaly in 1-6 years and 7-12 years age group was of infections origin accounting for 37.09% and 59.25%respectively. Commonest cause of Splenomegaly in 13-18years age group was Haematological disorders (36.36%).

Fever was found to be the most common presenting feature in present study The most common association with Splenomegaly was Hepatomegaly accounting for 78% followed by anaemia (55%) and then lymphadenopathy (36%).

Among hematologic disorders, Thalassemia was the most common disorder accounting for 7% of cases, followed by megaloblastic anaemia. Among the congestive disorders, Portal Hypertension secondary to Cirrhosis (4%) was the most common disorder.

Ultrasonography of the abdomen proved to be a useful tool to detect and confirm Splenomegaly.

Conflict of Interest: NIL

Funding: NIL

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