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Original Research Article

A clinicohematological profile of splenomegaly

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ABSTRACT

Background: Splenomegaly is a matter of considerable clinical concern as spleen is not normally palpable. Splenomegaly is associated with large number of disorders including hematological, infectious, congestive states related to portal hypertension, lymphohematogenous disorders, immunological conditions, storage disorders and miscellaneous conditions. So, all the cases of splenomegaly should be thoroughly investigated to ascertain etiology. Splenomegaly can be an important diagnostic clue to existence of an underlying pathology. The aim and objective of present study was to find out relative frequency of clinical conditions associated with splenomegaly, to study clinic-hematological profile of splenomegaly and to find out the role of hematological investigations as a diagnostic tool in elucidating etiopathogenesis of splenomegaly.
Methods: This was a cross sectional, observational study. Study was conducted on 135 pediatric as well as adult patients with splenomegaly admitted in medical ward, Government Medical College and tertiary care hospital Aurangabad, Maharashtra, India from December 2015 to October 2017. Hematological parameters of 135 cases of splenomegaly were analysed and correlated with clinical findings.
Results: Study comprises 135 patients. Age range was 3 months to 78 years. Males (54.81%) were affected more commonly than females (45.19%). The most common presenting complaint was fever (59.26%) followed by generalized weakness (51.11%) and pallor (44.44%). Majority of cases (48.15%) had grade II splenomegaly. Splenomegaly was associated with hepatomegaly (60.74%) and lymphadenopathy (18.52%). The commonest cause of splenomegaly found was anemia (39.26%) followed by hematological malignancies (20.74%), congestive states (11.85%) and infections (11.85%). Hematological investigations revealed diagnosis in majority of cases (71%).
Conclusions: Splenomegaly is an important clinical sign that must be investigated thoroughly as most of the common causes are treatable. Hematological causes outnumbered the non-hematological causes of splenomegaly. Hematological profile in cases of enlarged spleen are of utmost importance as a diagnostic or additional tool in elucidating the etiogenesis of splenomegaly.

Keywords: Clinicohematological profile, Lymphadenopathy, Hepatomegaly, Splenomegaly

INTRODUCTION

Spleen is the largest organ of lymphoreticular system. The spleen combines the innate and adaptive immune system in a uniquely organized way.[1] Clinically, spleen is palpable when it undergone enlargement by at least 2 folds. Splenomegaly is a subject of clinical concern as spleen is not palpable in normal individuals and palpable spleen in a symptomatic person is always significant. It may be an indicator of serious disorder.[2] Splenomegaly is associated with large number of disorders including haematological conditions, infectious disorders,

congestive states related to portal hypertension, lymphohematogenous disorders, immunological conditions, infiltrative diseases and miscellaneous conditions.[3] It is rarely the primary site of disease. Splenomegaly is the major manifestation when it is involved in systemic diseases.[4] It can be an important symptom as well as sign to the existence of an underlying disorder.[3] In most of the cases however, splenomegaly is usually the first and the only sign of an underlying serious disorder.[5] The incidence and etiology of splenomegaly is strongly dependent on the geographical location.[6] This study was undertaken with the aim of knowing clinico-hematological profile of splenomegaly and various etiological factors of splenomegaly that were prevalent in Marathwada region as well as to study the role of routine, readily available, low cost investigations in the diagnosis.

METHODS

Present study was based on 135 cases with splenomegaly. Study was carried out in Government Medical College and Hospital, Aurangabad, Maharashtra, India from December 2015 to October 2017. All the clinically inquired cases of splenomegaly, irrespective of age and sex were included in the study. Findings of general and physical examination were noted. The grading of splenomegaly was done by conventional as well as Hackett's method. Blood was collected with aseptic precautions for routine and special hematological investigations. Hemoglobin estimation, complete blood count, red cell indices (MCV, MCH, MCHC, RDW) were done on fully automated cell counter. Blood smears were stained with Leishmann stain and studied in detail. Biochemical investigations performed were serum bilirubin, SGOT, SGPT, blood urea and serum creatinine. Serological tests such as HIV, viral markers of hepatitis, Widal test, dengue antibodies test, rapid malaria test, leptospira antibodies test were done wherever indicated. Lymph node biopsy, liver biopsy, bone marrow aspiration and splenic aspiration cytology, sickle cell test, reticulocyte count, osmotic fragility test were done wherever indicated. Radiological investigations such as ultrasonography of abdomen, CT scan was performed when required.

RESULTS

The study comprised of 74 males (54.81%) and 61 (45.19%) female patients with M:F ratio of 1.21:1. Age range was 3 months to 78 years. Study showed 33% cases of pediatric age group and 67% of adult age group. Out of 135 patients, 41 (30.37%) patients were in the age group of 21-30 years. Only 11 (8%) patients were in the above 60-year age group (Figure 1). The most common presenting complaint was fever 80 (59%) followed by generalized weakness 69 (51%) and pallar 60 (44%) (Figure 2). The other complaints were lump in abdomen, history of bleeding, pain in abdomen and symptoms of general ill health. Clinical grading of splenomegaly was done with conventional method. Majority of cases 122 (94.37%) had either Grade I or II splenomegaly.

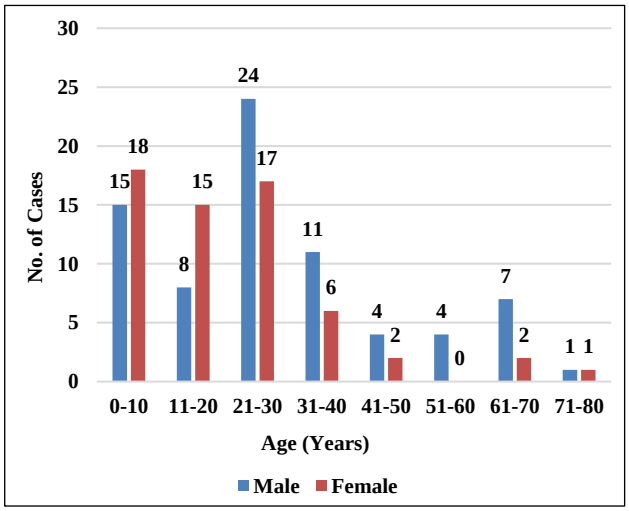

Figure 1: Splenomegaly- Age and sex wise distribution.

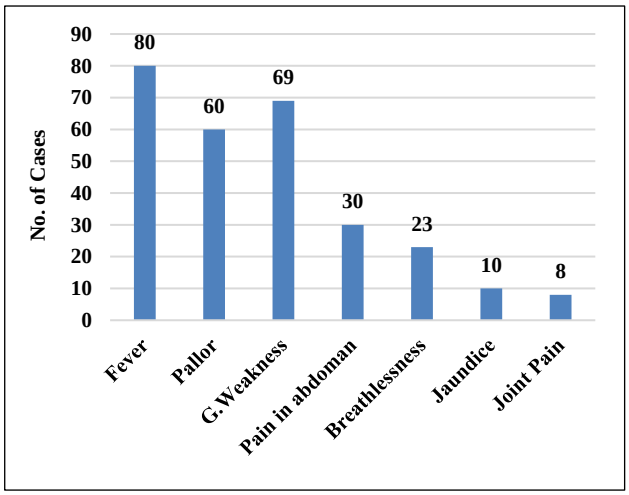

Figure 2: Splenomegaly-distribution of cases according to clinical manifestations.

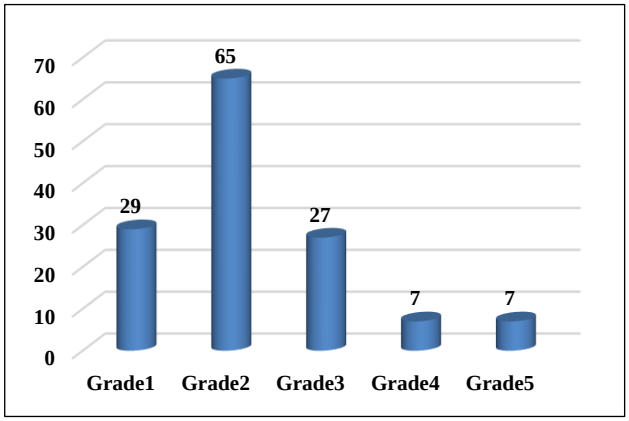

Figure 3: Splenomegaly-Hackett's Grade wise distribution.

Hackett's method for grading of splenomegaly was also employed. Majority of cases 65 (48.15%) had Grade II splenomegaly (Figure 3). The associated clinical findings were hepatomegaly 82 (60.74%) and lymphadenopathy 25 (18.52%).

In the present study, on CBC, haemoglobin percentage was found to be below 7 gm% in 58 (42.96%) cases. It was found to be between 7 to 10 gm% in 59 (43.70%) cases, and more than 10 gm% in 18 (13.33%) cases. Platelet count depleted in 78 (57.78%) cases. Thrombocytopenia is associated with most of the hematological conditions like anaemia and leukaemia. Decreased value of mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration seen in 48 (35.55%), 80 (59.26%), 68 (50.37%) cases respectively. MCV, MCH, MCHC values found to be decreased mostly in cases of anaemia.

In peripheral smear examination, 24 (17.78%) cases had microcytic hypochromic anaemia, 12 (8.89%) cases had macrocytic hypochromic anaemia and 13 (9.63%) had normocytic normochromic anaemia. Dimorphic picture was seen in 51 (37.78%) cases where as in 8 (5.93%) cases hemolytic features seen. 5 (3.70%) cases were positive for malarial parasite (Figure 4).

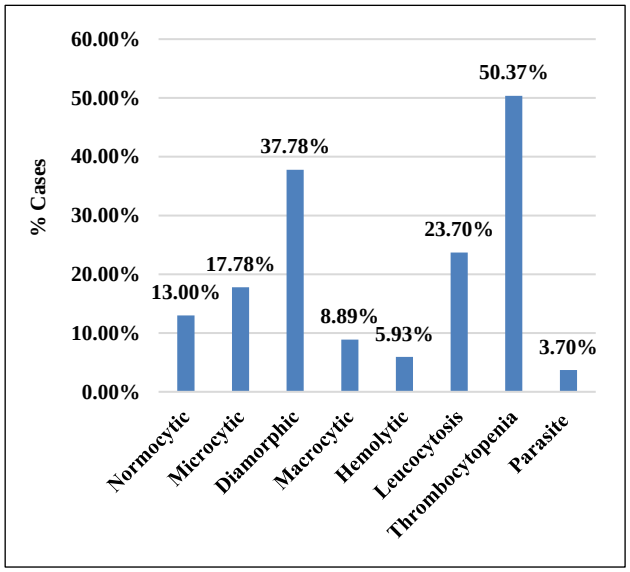

Figure 4: Splenomegaly-distribution PS findings.

In the present study, out of 135 cases, hematological etiology found in 82 (61%) cases, non-hematological etiology found in 41 (30%) cases, while 12 cases remain undiagnosed (Table 1).

There were 53 (M-25, F-28) cases of anemia, 28 (M-15, F-13) cases of leukemia and 16 (M-10, F-6) cases show congestive etiology. There were 16 (M-8, F-8) cases which show infective etiology and other 2 (M-2, F-0) cases which show infiltrative etiology whereas 7 (M-3, F-4) cases show miscellaneous etiology. There was one male patient with ITP. 12 (M-10, F-2) cases remain undiagnosed (Figure 5).

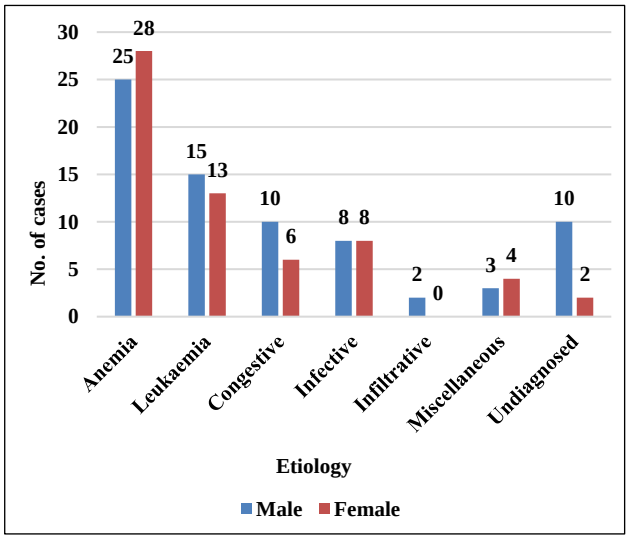

Figure 5: Splenomegaly- distribution of cases according to etiology.

Anaemia including hemolytic anaemia and hematological malignancies were the common etiologies 81 (60%) in the causation of splenomegaly. Grade I and Grade II splenomegaly were the most common in them.

In anaemia, hemolytic anaemia was the most common anaemia 25 (47.17%) followed by iron deficiency anaemia 10 (7.40%), dimorphic anaemia 10 (7.40%) and megaloblastic anaemia 08 (5.92%).

The hematological malignancies also encountered frequently 28 (20.74%). The most common malignancies were acute lymphoblastic leukaemia 7 (5.18%) and chronic myeloid leukaemia 7 (5.18%).

The infectious aetiologies included malaria (n=5), tuberculosis (n=4), dengue fever (n=3), leptospirosis (n=2), enteric fever (n=1), pyogenic meningitis (n=1) etc. Malaria was the most common among them (n=5).

Congestive splenomegaly was observed in 16 (11.85%) cases, out of which, 7 cases had liver disease and 9 cases had CCF.

Infiltrative disorders were observed in 2 (1.48%) cases. one case was of Niemann pick disease and one case was of Gaucher disease. Infiltrative diseases mainly encountered with Grade III (Hacketts method) splenomegaly.

In the present study, 96 cases were diagnosed with hematological investigations, out of which 42 (35%) cases were diagnosed with routine haematological investigations and 54 (68.35%) with bone marrow examination. Thus, hematological investigations play a

major role in the diagnosis. All cases were evaluated with biochemical investigations. In 14 (10.67%) cases, it was helpful to make diagnosis. Serological investigations were diagnostic in 17 out of 33 cases (51.52%). USG abdomen was diagnostic in 2 cases (2.50%), other radiological investigations were diagnostic in 11 cases out of 15 (73.33%).

FNAC of spleen was done in 1 case, which was helpful in diagnosis (100%). Histopathology of spleen was done in 4 cases, in 2 (50%) cases it supported the diagnosis. Histopathology of lymph node was diagnostic in 70% cases. Liver biopsy was done in 10 cases, out of which 7 were diagnostic (70%). In few cases multiple investigations were done to establish the diagnosis.

Table 1: Splenomegaly- age and sex wise etiological distribution (N=135).

Diagnosis		No. of cases				Total (%)
		Male <15 yrs	Male >15 yrs	Female <15 yrs	Female >15 yrs	
Hematological						
Aneamia						
Iron deficiency anaemia		--	04	02	04	10 (7.40%)
Megaloblastic anaemia		--	05	02	01	08 (5.92%)
Diamorphic anaemia		01	06	03	--	10 (7.40%)
Hemolytic anaemia	Sickle cell anaemia	02	--	--	03	05 (3.70%)
	Thalasemia	02	01	02	02	07 (5.18%)
	Sickle cell-Thalasemia	01	01	--	03	05 (3.70%)
	AIHA	--	--	--	02	02 (1.48%)
	Hemolytic anaemia (NST)	02	--	02	02	06 (4.44%)
Leukemia						
Acute myeloid leukaemia		--	01	02	01	04 (2.96%)
Acute lymphoblastic leukaemia		03	01	03	--	07 (5.18%)
Chronic myeloid leukaemia		--	03	--	04	07 (5.18%)
JCML		01	--	01	--	02 (1.48%)
Chronic lymphoblastic leukaemia		--	02	--	--	02 (1.48%)
AML with Thalesemia		01	--	--	--	01 (0.74%)
Lymphoma-leukaemia		--	03	01	01	05 (3.70%)
ITP		01	--	--	--	01 (0.74%)
Non-hematological						
Infective						
Malaria		--	01	02	02	05 (3.70%)
Leptospirosis		--	02	--	--	02 (1.48%)
Dengue fever		--	01	--	02	03 (2.22%)
Enteric fever		--	01	--	--	01 (0.74%)
Tuberculosis/Tuberclous meningitis		--	03	--	01	04 (2.96%)
Pyogenic meningitis		--	--	--	01	01 (0.74%)
Congestive						
Liver disease		--	05	01	01	07 (5.18%)
Congestive cardiac failure		02	03	02	02	09 (6.67%)
Infiltrative						
Niemann pick disease		01	--	--	--	01 (0.74%)
Gaucher disease		01	--	--	--	01 (0.74%)
Miscelleneous						
Splenic cyst		--	--	--	01	01 (0.74%)
Spelnic abscess		--	--	--	01	01 (0.74%)
SLE		--	01	--	--	01 (0.74%)
Griscelli syndrome		--	--	01	--	01 (0.74%)
Tropical		--	02	--	01	03 (2.22%)
Undiagnosed		01	09	01	01	12 (8.89%)
Total		19 (14.07%)	55 (40.74%)	25 (18.52%)	36 (26.67%)	135 (100%)

NST-No specific type, HTN-Hypertension, AIHA-Autoimmune hemolytic anaemia.

DISCUSSION

The enlarged spleen is a frequent and important sign in clinical practice. It is generally observed by the clinician, in systemic examination. In few cases, it is described by the patient as lump in abdomen or distension of abdomen.

Splenomegaly in a symptomatic patient is of considerable clinical significance. One needs to investigate a case of splenomegaly as many of the conditions causing splenomegaly are treatable.[4]

Splenomegaly requires multiple steps to identify the aetiology. However, hematological work up is informative in most of the cases. In some cases, the exact cause of splenomegaly cannot be identified despite all diagnostic studies.

World-wide, splenomegaly is not uncommon, but clinical symptoms, signs and major etiological factors differ considerably, according to geographic distribution of diseases.

In the study, 2500 patients were randomly screened which revealed splenomegaly in 135 cases giving a crude figure of frequency of 5.4%. An incidence of 6.8% of palpable spleen is reported by Nadeem A et al.[4]

The present study shows male to female ratio of 1.2:1, which was comparable with the study by Varsha S et al.[2]

The most common presenting complaint was fever (59%) followed by generalized weakness (51%) and pallar (44%). Varsha S et al, and Nadeem et al, also noted fever, generalized weakness and pallor as most frequent clinical features.[2,4]

In present study, the most common grade of splenomegaly was mild (Grade I and II, 69.7%) followed by moderate (Grade III, 20%) and massive (Grade IV and V, 10.3%). This was comparable with the studies by Varsha S et al, Nadeem et al, Hussain et al, and Deepti et al.[2,4,7,8]

In the present study, hepatomegaly was found in 60.74% cases and associated lymphadenopathy was found in 18.52%, which is comparable with Ali N et al.[9]

In the present study, anaemia (39.25%) and haematologic malignancies (20.74%) were found to be major aetiological factors along with other congestive, infective, infiltrative and miscellaneous causes, which is comparable with Shirish S et al, study.[3]

Varsha S et al, found infection as the most common etiological factor. They noticed congestive splenomegaly in 23%, anaemia in 13% cases followed by leukaemia in 9% cases.[2]

Shirish S et al, found anemia (32%) as the commonest aetiolgoical factor.[3] They noticed iron deficiency anaemia (18%), megaloblastic anemia (8%), diamorphic anemia (4%) thalassemia (2%) and infectious like malaria in 8%, dengue in 2%, AIDS in 2% cases.

Bathija DM et al, found anaemia as the most common cause followed by infective and congestive splenomegaly. Leukaemia found in 4% cases (Table 2).[10]

Table 2: Splenomegaly-comparison of aetiological distribution.

Diagnosis	Varsha et al[2]	Shirish S et al[3]	Bathija DM et al[10]	Present study
Anaemia	13	32	55	39.25
Leukaemia/Lymphoma	9	22	4	20.74
ITP	-	4	1	0.74
Infective and Inflammatory	49	14	30	11.85
Infiltrative disease	-	-	-	3
Congestive	23	20	10	11.85
Others	4	8	-	2.96
Undiagnosed	2	-	-	8.89
Total	100%	100%	100%	100%

Table 3: Splenomegaly-comparison of diagnostic percentage of hematological investigations in various studies.

Authors	Diagnostic percentage
Kulkarni M et al[11]	76.66%
Pore S et al[12]	62.00%
Present study	71.00%

The case of splenomegaly needs a battery of investigations to reach to the diagnosis. Hematological investigations played a major role in the diagnosis. 71% cases could be diagnosed on hematological basis (Table 3).

CONCLUSION

Splenomegaly is an important clinical sign that must be investigated thoroughly as most of the common causes are treatable.

Hematological causes outnumbered the non-hematological causes of splenomegaly. The most frequent cause of splenomegaly was anaemia followed by hematological neoplastic conditions.

Hematological profile in cases of enlarged spleen are of utmost importance as a diagnostic or additional tool in elucidating the etiogenesis of splenomegaly. Bone marrow examination is a key investigation in adult whereas hemolytic profile and HPLC, electrophoresis is important in paediatric patients.

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