BONE MARROW ASPIRATE FINDINGS IN CASES OF HEPATOSPLENO-MEGALY AT A TERTIARY CARE CENTRE

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ABSTRACT

Objective: To determine the bone marrow aspirate findings in cases of hepatosplenomegaly.

Material and Methods: It was a cross sectional descriptive study done in the pathology department, Khyber Teaching Hospital, Peshawar. The study was conducted from January to December 2016 (one year duration). Total 352 cases were referred to the pathology department for bone marrow aspiration during this period. Out of these, 124 cases had hepatosplenomegaly. Bone marrow aspiration and biopsy were performed, slides were stained and reported by the consultant pathologist. Cases with inadequate bone marrow aspirate were excluded from the study. Mean and standard deviation were calculated for quantitative variables. Frequency and percentages were calculated for qualitative variables.

Results: Out of 124 cases with hepatosplenomegaly, 8 had diluted aspirate and thus inadequate to make final diagnosis. Additionally, no specific diagnosis was possible in another 24 cases. So, these 32 cases were excluded and remaining 92 cases were included in the study. Age of the study sample ranged from 9 months to 72 years with mean of 36±17. Regarding gender distribution, 51 (55 %) were male and 41 (45 %) female with male to female ratio of 1.2:1. The commonest diagnosis was acute lymphoblastic leukemia, followed by reactive marrow and acute myeloid leukemia (seen in 24 %, 13 % and 9.7 % cases respectively). Less common causes included essential thrombocythemia, chediak hegashi syndrome and myelodysplastic syndrome.

Conclusion: There is a wide spectrum of bone marrow findings in cases of hepatospenomegaly. Acute lymphoblastic leukemia is the commonest bone marrow finding in cases with hepatosplenomegaly in our study. Bone marrow biopsy is a reliable diagnostic tool to give the definitive diagnosis in the cases with hepatosplenomegaly whether it is hematological or non-hematological in origin.

Key Words: Hepatosplenomegaly, Acute lymphoblastic leukemia, Bone marrow aspiration, Reactive marrow, Chediak hegashi syndrome.

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INTRODUCTION

Abnormal enlargement of liver is referred to as hepatomegaly, while enlargement of spleen as splenomegaly [1,2]. The enlargement of both the liver and spleen is referred to as hepatosplenomegaly [1,2,3]. Hepatomegaly is a clinical sign that is said to occur when the lower margin of liver extends below right costal margin [3,4]. Likewise, spleen is said to have enlarged when it extends below left costal margin and can be palpated, or when it is enlarged on ultrasound scan [3].

There are several significant functions of the liver and spleen [5]. The liver is the largest organ of the body which produces various proteins like albumin and clotting factors [5]. It also plays an important role in the excretion of bilirubin from the body [5]. Whereas, the spleen is a secondary lymphoid organ. Spleen plays a role in destruction of aged red blood cells completing their life time [5]. It is also a reservoir of blood and can compensate for blood loss in states of shock.

There are a number of hematological and non-hematological diseases that manifest as hepatosplenomegaly [3,5,6]. Hepatosplenomegaly may results due to primary diseases of these organs, or as a part of a systemic disorder that secondarily involve liver and spleen [1]. These may include infections like malaria, hematological malignancies like leukemias and lymphomas and other disorders like collagen vascular diseases, leshmaniasis and infiltration of these organs by cancer cells. [5,6,7,8]. In children, the common disorder that causes hepatosplenomegaly are storage disorders including Gauchers disease, Niemann pick disease and anemias [5,7,8,9,10,11]. In certain disorders like malaria, chronic myeloid leukemia and myelofibrosis, there is massive splenomegaly as well [6].

If a patient presents with hepatospleno-megaly, a detailed history should be taken and

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necessary investigations like liver function tests and ultrasound abdomen should be done [1]. This helps to narrow down the differential diagnosis [1]. It is also necessary to look for signs like fever, jaundice, lymph node, anemia, ascites, joint pain and rashes [1]. Bone marrow aspiration and biopsy is a diagnostic procedure that is performed in all cases of hepatosplenomegaly to make final diagnosis.

Bone marrow aspiration and biopsy examination is useful in cases of hematological malignant disorders [6]. In such cases the bone marrow aspirate shows replacement of the bone marrow by malignant cells [12,13,14]. Other disorder can also be diagnosed on bone marrow biopsy. The bone marrow findings are interpreted according to the clinical history and physical examination of the patient, and the diagnosis is established accordingly [12,13,14,15].

The present study was done to find the bone marrow aspiration findings in cases of hepatospleno-megaly presenting to the tertiary care centre.

MATERIAL AND METHODS

This was a cross sectional descriptive study done in the pathology department, Khyber Teaching Hospital, Peshawar. It was conducted from January to December 2016. Non-probability purposive sampling technique was used to collect sample. Patients of all ages and both sexes having hepatosplenomegaly were included in the study. Cases with inadequate aspirate specimen were excluded from the study. Bone marrow aspiration and biopsy was done. The slides were stained and reported by the consultant pathologist. The findings were recorded and results were drawn. Mean and standard deviation were calculated for quantitative variables. Frequency and percentages were calculated for qualitative variables.

RESULTS

Out of 352 cases that were referred to the pathology department for bone marrow aspiration during the study period, 124 cases had hepatosplenomegaly as detected through clinical examination and abdominal ultrasound scan. Out of these 124 cases, 8 had aspirate specimen diluted which was inadequate to make final diagnosis. Also, no specific diagnosis could be made in 24 cases. So, these 32 cases were excluded from 124 cases and so the remaining 92 cases were included in the study.

Age range of the study samples was 9 months to 72 years. Mean age of the study sample was 36±17 years. The different bone marrow aspiration findings in cases of hepatosplenomegaly are shown in Table-1. It is evident that among malignant etiologies the most common finding was acute lymphoblastic leukemia that was observed in 24% samples. However, amongst nonmalignant etiologies reactive marrow/normocellular marrow was most frequent. Malignant etiologies were accounted for 64% and nonmalignant etiologies accounted for 33% of hepatosplenomegaly.

Table-1: The bone marrow aspiration findings in 92 cases of hepatosplenomegaly

Malignant etiologies	**n (%)**
Acute lymphoblastic leukemia	**22 (24%)**
Acute myeloid leukemia	**9 (9.7%)**
Mononuclear infiltration	**8 (8.7%)**
Chronic lymphocytic leukemia	**8 (8.7%)**
Chronic myeloid leukemia	**5 (5.4%)**
Hyper eosinophilic syndrome	**3 (3.2%)**
Primary myelofibrosis	**2 (2.2%)**
Essential thrombocythemia	**1 (1.1%)**
Myelodysplastic syndrome	**1 (1.1%)**
Total	**59 (64.2%)**
Non-Malignant etiologies	**n (%)**
Reactive marrow/normocellular marrow	**12 (13%)**
Erythroid hyperplasia/hemolytic anemia	**8 (8.7%)**
Anemia of chronic disorder	**6 (6.5%)**
Niemann pick disease	**6 (6.5%)**
Chediak higashi syndrome	**1 (1.1%)**
Total	**33 (35.8%)**

DISCUSSION

Hepatosplenomegaly is common clinical sign that is encountered by physicians in day to day clinical practice [5]. Usually, it is detected through clinical examination and/or ultrasound scan [5]. There is an exhausting list of causes of hepatospleno-megaly that should be narrowed down by appropriate investigations [5]. It is important to know the underlying etiology of hepatosplenomegaly, which may be a hematological or non-hematological malignancy carrying a poor prognosis [5,15]. Timely detection however, may help in early treatment and better prognosis.

In our present study, gender distribution shows male to female ratio of 1.2:1. Similar data with male predominance is reported by Humaira *et al* from Jamshoro in 2016 [15]. Same male predominance is reported by Adelusola and Champatiray (2007) in their studies [16,17]

In our present study, the commonest etiology of hepatosplenomegaly was acute lymphoblastic leukemia (ALL), followed by reactive marrow. This is contrary to the findings of Jiskani *et al.* (2018) where it was reported that the infections were the most

common cause of hepatosplenomegaly, followed by reactive changes [5]. In study done by Humaira *et al.* leukemia was third most common cause of hepatosplenomegaly [15]. In the present study, overall, the malignant etiologies exceeded the proportion of non-malignant etiologies (64 % versus 36 %) in cases of hepatosplenomegaly. While the study by Ali *et al.* showed that 37 % cases of hepatosplenomegaly had malignant disorders [16]. Our results showed similarity to the study by Adelusola, where hematological malignancies were the commonest cause of hepatosplenomegaly, followed by infections [17]. ALL is hematological malignancy of hematopoietic cells of lymphoid lineage [18]. Nonetheless, the exact etiology of ALL is not known [18]. However, exposure to pesticides, viral infection and exposure to radiation are thought to be responsible for causing leukemia [18].

In the developed countries hematological malignancies are the major cause of hepatosplenomegaly. Whereas, in developing countries, the infections are the major cause of hepatosplenomegaly [1]. Interestingly, in our study hematological malignancies were common cause of hepatosplenomegaly. This may be due to the fact that being a tertiary care setup we do not receive much of the load of infection due to the treatment of infectious diseases like malaria at primary and secondary health setups.

CONCLUSION

There is a wide spectrum of bone marrow aspiration findings in cases of hepatosplenomegaly in our region. Hematological malignancies are common as compared to nonmalignant causes. All these disorders should be kept in differential diagnosis while evaluating such patients.

AUTHORS CONTRIBUTION

Muhammad Ihtesham Khan: Principle author, Author.

Syeda Hina Fatima: Result compilation, Review of literature.

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