

Original article:

Study of role of bone marrow trephine biopsy in diagnosing haematological disorders

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ABSTRACT

INTRODUCTION: Blood and Bone marrow is one of the largest organs in the body and is an important target organ of various kinds of hematological and non-hematological disorders. With this view present work was planned to study of role of bone marrow trephine biopsy in diagnosing haematological disorders

MATERIALS AND METHODS: This was the prospective study carried out in our institute for 2 years duration. We studied 42 cases of Bone Marrow Biopsy received in department of pathology. Detail clinical history and physical examination was done as per proforma annexed.

RESULTS: Acute leukaemia was commonest finding in 22 patients(52.38%), followed by normal marrow in 11 patients(26.19%), Aplastic/Hypoplastic marrow in 5 patients(11.95%),Lymphoma in one patient(2.38%) and Inadequate marrow in 7.14% patients.

CONCLUSION: Bone marrow trephine biopsy is very useful in patients who had inadequate aspirates or dry taps with packed marrow in acute leukaemia.

INTRODUCTION

Blood and Bone marrow is one of the largest organs in the body and is an important target organ of various kinds of hematological and non-hematological disorders. Bone marrow trephine was first performed in 1903 by Piance, since then the procedure has seen a lot of advances and refinements. Bone marrow trephine biopsy is a well established minor surgical procedure for the inspection of bone marrow usually done along with bone marrow aspiration.^[1]In general, the patients with hypocellular bone marrow or bone marrow fibrosis are more likely to need a trephine biopsy for adequate assessment. In such patients, an aspirate will probably be inadequate or even impossible.^[2] With this view present work was planned to study of role of bone marrow trephine biopsy in diagnosing haematological disorders

MATERIALS AND METHODS

This was the prospective study carried out in our institute for 2 years duration. We studied 42 cases of Bone Marrow Biopsy received in department of pathology. Detail clinical history and physical examination was done as per proforma annexed.

Patients were investigated for following:

Blood in EDTA bulb received from concerned departments, was processed for haematological parameters mentioned in proforma on Electronic cell counter i.e. Mythic and Erma.

Peripheral Blood Smear:

PBS was obtained and was stained by Leishman stain. Peripheral smear examination was done systematically under low power, high power and oil immersion.

Bone Marrow Aspiration:

We received spreaded bone marrow aspiration slides which were without anticoagulant to avoid storage artefact and also 0.2-0.3ml of marrow contents in bottle containing EDTA. They then were stained with Leishman’s stain.

OBSERVATIONS & RESULTS

Forty two cases admitted in our institute, as in-patients from December 2010 to October 2012 for the evaluation of various haematological disorders were studied.

The data collected was studied.

Table 1: Distribution of haematological disorders:

Disorders	Number of cases	Percentage
Acute Leukaemia	22	52.38
Aplastic/Hypoplastic marrow	5	11.95
Lymphoma	1	2.38
Normal marrow	11	26.19
Inadequate marrow	3	7.14

Acute leukaemia was commonest finding in 22 patients(52.38%), followed by normal marrow in 11 patients(26.19%), Aplastic/Hypoplastic marrow in 5 patients(11.95%),Lymphoma in one patient(2.38%) and Inadequate marrow in 7.14% patients.

Table 2:Distribution of Study sample according to age groups:

Age	Frequency	%
<10	26	61.9
11-20	12	28.5
21-30	1	2.3
31-40	1	2.3
41-50	1	2.3
51-60	0	0
61-70	1	2.3

Common age groups in this study were less than 10 years in 61.9% patients and 11-20 years in 28.5%.

Table 3: Distribution of Haematological Disorders according to sex:

Sex	Frequency	%
Male	24	57.14
Female	18	42.85

In present study there was male dominance. We found male distribution in 57.14% and female in 42.85%.

Table 4-: Case wise distribution of various disorders according to age groups:

Disorders	Age in years								Total = 42
	<10	11-20	21-30	31-40	41-50	51-60	61-70	>70	
Acute Leukaemia	14	7	-	1	-	-	-	-	22
Aplastic marrow/ Hypoplastic marrow	5	-	-	-	-	-	-	-	5
Lymphoma	-	-	-	-	1	-	-	-	1
Normal marrow	6	3	1	-	-	-	1	-	11
Inadequate marrow	1	2	-	-	-	-	-	-	3

In the present study 14 cases of acute leukemia were less than 10 years of age group, 7 cases in 11-20 years age group, 1 case in 31-40 years age group. 5 cases of aplastic/ hypoplastic marrow were in less than 10 years age group. Normal marrow was seen in 6 cases in less than 10 year age group, 3 cases in 11-20 years age group, one patient in 21-30 years, one patient in 61-70 year age group. Inadequate marrow one case was less than 10 years age group and 2 cases were in 11-20 years group. Trepine biopsy was inadequate in 3 patients, of these one was female and two were male. Out of 3 cases, bone marrow aspiration showed acute lymphoblastic leukemia in 2 cases and erythroid hyperplasia with normoblastic maturation in one case.

DISCUSSION

This study was carried out on forty two cases admitted in our institute for the evaluation of various haematological disorders. Of these forty two cases, showed acute leukemia in 22 cases(52.38%), aplastic marrow/ hypoplastic marrow in 5 cases(11.95%), lymphoma in one case(2.38%), normal marrow in 11 cases (26.19%) and 3 biopsies (7.14%) were inadequate.

It was found that complete clinical and other relevant parameters were needed in evaluating the bone marrow aspiration smears and biopsy sections to arrive at a conclusive diagnosis.³

Ideally the bone marrow core biopsy should be reviewed with the knowledge of clinical history, complete blood counts, peripheral blood picture and bone marrow aspirate smears proved to be correct in our study⁴

Bain BJ in her survey of adverse events associated with bone marrow biopsy has quoted that twenty six adverse events including one death directly attributable to the procedure has occurred among an estimated 54,890 biopsies. Most frequent and most serious adverse event was hemorrhage in fourteen patients^[9]. No adverse effects of biopsy were found in present study.

TABLE 5 : COMPARISON OF STUDIES OF BONE MARROW BIOPSY IN HAEMATOLOGICAL DISORDERS:

Study	Year	AL	APL/HPL	Lymph-oma	Normal	Inadequate
R Burkhardt et al ^[23]	1982	11%	14%	-	-	-
Bashawri Layla ^[48]	2002	22.2%	-	3.5%	-	-
Afzal Khan et al ^[49]	2008	11.6%	20.2%	-	-	-
Mohammad et al ^[24]	2010	2.56%	7.69%	13%	29.05%	9.40%
Present study	2012	52.38%	11.95%	2.38%	26.19%	7.14%

[AL:AcuteLeukaemia, ALL:Acute Lymphoblastic Leukaemia,APL/HPL:Aplastic marrow/Hypoplastic marrow]
 R Burkhardt et al.(1982) 5in their study found aplastic anaemia in 14% cases and acute Leukaemia in 11% cases.
 Mohammad.et al.(2010) ⁶ in their study found lymphoma in 13% cases, aplastic/hypoplastic marrow in 7.69% cases,acute leukaemia in 2.56% cases,normal marrow in 29.05% cases and inadequate marrow in 9.40% cases.
 In present study acute leukaemia was the commonest finding in 52.38% patients, followed by normal marrow in 26.19%, aplastic/hypoplastic marrow in 11.95% patients, lymphoma in 2.38% patients and inadequate marrow in 7.14% patients.

Amongst the 22 cases diagnosed as acute leukaemia, we got acute lymphoblastic leukemia in 12 cases (28.57%), acute promyelocytic leukaemia in one case (2.38%) and acute leukaemia (unclassified) in 9 cases (21.4%).

In present study in 2012,61.9% of cases were in the age group of 1-10 years and 28.5% patients were in the age group 11-20 years.

Present study is comparable to Afzal Khan.et al.(2008) ⁶ who also had common age group of 1-5years.

In present study common clinical features were pallor in 95.23% cases, fever in 76.19% cases, hepatomegaly in 57.14% cases and splenomegaly in 42.85% cases. Also in present study on peripheral smear blasts percentage was high in 52.38% patients as compared to other studies as the number of leukaemia cases were high.

In present study maximum cases were diagnosed on bone marrow biopsy, as we received bone marrow biopsy many times in cases where bone marrow aspiration was dry tap or diluted with peripheral blood .Simultaneous procedure was followed only in few cases.

CONCLUSION

Bone marrow trephine biopsy is very useful in patients who had inadequate aspirates or dry taps with packed marrow in acute leukaemia.

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