

Original article:

Study of role of bone marrow trephine biopsy in patients of pancytopenia

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ABSTRACT:

INTRODUCTION: Bone marrow aspiration and biopsy are complementary in diagnosing cases of acute leukaemia, chronic lymphocytic leukaemia, and chronic myelogenous leukaemia. Biopsy is of particular value in patients with inadequate aspirate specimens (or dry taps) with packed or empty marrows in acute leukaemia.

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. Out of 15 cases of pancytopenia 5 cases (33.33%) presented with aplastic/hypoplastic marrow, 3 cases (20%) presented with Acute lymphoblastic leukaemia , 2 cases (13.3%) of Acute leukaemia(unclassified) and 1 case (6.67%) of Acute promyelocytic leukaemia.

CONCLUSION: In present study the most common cause of pancytopenia was aplastic/hypoplastic marrow in 33.3% cases, followed by acute lymphoblastic leukaemia in 20% cases and normal marrow in 20%.Common age group of presentation was between 1-20 years.

INTRODUCTION

Bone marrow aspiration and biopsy are complementary in diagnosing cases of acute leukaemia, chronic lymphocytic leukaemia, and chronic myelogenous leukaemia. Biopsy is of particular value in patients with inadequate aspirate specimens (or dry taps) with packed or empty marrows in acute leukaemia.¹

Similarly, only a trephine biopsy shows the architecture of the bone marrow and permits the detection of abnormal distribution of cells, bone marrow granulomas, and focal lymphoid infiltrates. There is also a greater likelihood of detection of infiltration by nonhaemopoietic neoplasms. Unexplained pancytopenia and an unexplained leucoerythroblastic blood film are indications for a trephine biopsy because they are likely to indicate bone marrow infiltration or fibrosis. ^[2] Bone marrow trephine biopsy has a major role in certain circumstances,where immunohistochemistry is required and antigen expression has to be evaluated in special contexts^[3, 4] The present studydeals with assessment of diagnostic utility of bone marrow trephine biopsy,over the other conventional methods like bone marrow aspiration technique,in the diagnosis of haematological disorder.

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.

TABLE 1: Cases presenting as pancytopenia in various haematological disorders.

Disorders	Number of cases /15	%
Aplastic/Hypoplastic marrow	5	33.33
Acute Lymphoblastic Leukaemia	3	20
Acute Leukemia(unclassified)	2	13.3
Acute Promyelocytic Leukaemia	1	6.67
Normal marrow	3	20
Inadequate marrow	1	6.67

Out of 15 cases of pancytopenia 5 cases (33.33%) presented with aplastic/hypoplastic marrow, 3 cases (20%) presented with Acute lymphoblastic leukaemia , 2 cases (13.3%) of Acute leukaemia(unclassified) and 1 case (6.67%) of Acute promyelocytic leukaemia.

TABLE 2:Age Distribution in Pancytopenia Patients:

AGE	FREQUENCY	PERCENTAGE
1-10	12	80%
10-20	3	20%

In present study pancytopenia was seen in 12(80%) patients in 1-10 year age group, 3(20%) patients in 10-20 year age group.

TABLE 3: Sex distribution in pancytopenia patients:

SEX	FREQUENCY	PERCENTAGE
MALE	9	60%
FEMALE	6	40%

In present study, pancytopenia was seen 60 % male and 40% female patients.

TABLE 4: Clinical features of patients presenting with pancytopenia.

CLINICAL INDICATIONS	NUMBER OF CASES/5	% OF CASES
Pallor	14	93.33%
Fever	12	80%
Splenomegaly	6	40%
Hepatomegaly	7	46.66%
Lymphadenopathy	4	26.66%
Bleeding	1	6.66%
Petechiae	1	6.66%%

Common clinical features in pancytopenia patients were pallor, fever, hepatosplenomegaly, lymphadenopathy, bleeding and petechiae.

DISCUSSION

Table 5: Comparison of studies with commonest causes of pancytopenia:

STUDY	YEAR	NO OF CASES	COMMONEST CAUSE	SECOND MOST COMMON CAUSE
Vijai tilak et al ⁷	1999	77	Megaloblastic Anaemia(68%)	Aplastic anaemia (7.7%)
Mussarat Niazi. et al ⁶	2000	89	Aplastic Anaemia(38.3%)	Megaloblastic Anaemia(24.7%)
Kishor Khodke et al ⁷	2001	50	Megaloblastic Anaemia(44%)	Aplastic anaemia (14%)
Mohammad Tariq ⁸	2010	50	Aplastic anaemia(36%)	Megaloblastic Anaemia(16%)
Present Study	2012	15	Aplastic/ Hypoplastic marrow(33.3%)	ALL(20%)

In all studies aplastic anaemia was the commonest cause followed by megaloblastic anaemia except Vijai Tilak. et al^[81] and Kishor Khodke. et al.^[84] who got megaloblastic anaemia as the commonest cause. In present study commonest cause of pancytopenia was aplastic/hypoplastic marrow in 33.3% followed by acute lymphoblastic leukaemia in 20%.

Table 6: Comparison of studies with common disorders in pancytopenia patients:

	AL (unclassified)	ALL	APLASTIC/H YPO.	NORMAL BM	APML	INAD
Vijai Tilak et al(1999) ⁵	-	-	7.70%	-	-	-
Mussarat Niazi et al(2000) ⁶	13%	-	38.3%	-	-	-
Kishor Khodke et al(2001) ⁷	0.02%	-	14%	-	-	-
Mohammad Tariq et al(2010) ⁸	-	12%	36%	-	-	-
Present Study(2012)	13.3%	20%	33.33%	20%	6.67%	6.67%

[AL:Acuteleukaemia,ALL:Acute lymphoblastic leukaemia APML:Acute Promyelocytic Leukaemia,INAD:Inadequate, HYPO: Hypoplastic marrow].

Table 7: Comparison of studies with sex ratio of pancytopenia patients:

Study	Sex ratio(M:F)
Vijai Tilak et al ^[81] (1999)	1.138:1
MussaratNiazi et al ^[82] (2000)	1.49:1
Kishor Khodke et al ^[84] (2001) ⁷	1.3:1
Mohammad Tariq et al ^[47] (2010) ⁸	1.7:1
Present study(2012)	1.5:1

In present study the most common cause of pancytopenia was aplastic/hypoplastic marrow in 33.3% cases, followed by acute lymphoblastic leukaemia in 20% cases and normal marrow in 20%.Common age group of presentation was between 1-20 years. M:F ratio was 1.5:1 which is comparable to other studies. The common clinical features were pallor 93.3%, fever in 80%, hepatomegaly in 46.66%, Splenomegaly in 40%, bleeding in 6.66% and petechiae in 6.66% which is comparable to other studies except high percentage of fever in our study.

CONCLUSION

In present study the most common cause of pancytopenia was aplastic/hypoplastic marrow in 33.3% cases, followed by acute lymphoblastic leukaemia in 20% cases and normal marrow in 20%.Common age group of presentation was between 1-20 years.

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