



VALUE OF BONE MARROW ASPIRATION IN DIAGNOSIS OF HAEMATOLOGICAL DISORDER : TERTIARY CARE BASED ONE YEAR STUDY

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ABSTRACT **BACKGROUND:** Bone marrow aspiration is a minimally invasive procedure, provides excellent cytological detail and use in evaluation of diagnosis, management of various blood and bone marrow disorder.

AIM: to study the spectrum of haematological and non haematological disorders diagnosed on bone marrow aspiration.

MATERIAL AND METHOD: The present study was conducted in the hematology section of department of pathology RNT Medical college and MB Hospital, Udaipur for a period of one year from June 2019 to 2020. A total 150 cases in present study and the process of BMA from posterior superior iliac spine. BMA smears were stained with Giemsa stain for morphologic examination.

RESULT- The present study included 150 cases. CML cases 60 (40%) was the most common leukemia and sickle cell disorder case 1 were least common cases in our study. Most cases were presented in First and fifth decade. 72 (48%) cases were hypercellular and 105 most common complaint cases presented dyspnea and pallor.

CONCLUSION: Bone marrow examination is a useful and cost effective procedure in diagnosis of both haematological and non-hematological disorders. Bone marrow examination plays a role in initiation of treatment, control, cure of the diseases.

KEYWORDS : Bone marrow aspiration, leukemia, CML

INTRODUCTION

Bone marrow examination is an essential investigation for diagnosis and management of many disorders of blood and bone marrow¹.

Bone marrow aspiration first done by Mosler in 1876 using a regular wood drill to aspirate bone marrow particles from a patient with leukaemia².

Often times, patients with suspected marrow disease where diagnosis remains inconclusive after examination of ancillary test require⁴.

Bone marrow aspiration samples are useful in further diagnostic assays including special stain Immunophenotyping, cytogenetics studies and molecular study^{2,3,5}.

The role of evaluation of bone marrow cannot be underestimated in the practice of medicine. It serves as a very useful diagnostic tool in many haematological disorders originating and infiltrating the marrow, as well as many non-hematological disorders documented to have bone marrow involvement⁶.

MATERIAL AND METHOD

The prospective study carried the period of sampling June 19 to May 20. Samples of bone marrow aspiration were collected from hematology (pathology) department of RNT Medical college.

The standard technique was employed for obtaining the aspirate sample using Salh's needle from posterior superior iliac spine is site of choice for most of the patient, tibia for infants and sternum in case of obese person.

All patients were checked for any major coagulation disorder. The smear was prepared by wedge-spread and stained with Giemsa method. The cellularity of bone marrow aspiration smear was assessed in the particles and their trails considering the proportion of haematological cells and adipocytes in the particle. The normal cellularity varies with age and evaluation of cellularity must along in context of age.

OBSERVATION AND RESULT

Total 150 cases in our study, most common haematological disorder (leukaemia) CML 60 cases (40%) followed by ALL, 28 cases (18.6%), Anemia 20 cases (13.3%) and minimal cases of Granuloma (1.3%), MDS (1.3%), Lymphoma (0.6%) and sickle cell disorder (0.6%).

Table 1: spectrum of haematological disorders diagnosed in bone marrow aspiration.

S.NO.	DIAGNOSIS	NUMBER OF CASES	PERCENTAGE (%)
1	CML	60	40
2	ALL	28	18.6
3	ANEMIA	20	13.3
4	CLL	14	9.3
5	AML	8	5.3
6	ITP	6	4
7	PCD	4	2.6
8	METASTASIS	4	2.6
9	GRANULOMA	2	1.3
10	MDS	2	1.3
11	LYMPHOMA	1	0.6
12	SICKLE CELL	1	0.6

In a total 150 cases, maximum number of cases 32 (21.33%) were in 0-10 (first decade), 41-50 (fifth decade) year age group. Minimum number of cases were in 71-80 (eight decade) was 7 (4.66%) and >80 year only one case (0.66%) observed. The age group range from 5 months to 85 years.

TABLE :2 CASES ACCORDING TO AGE GROUP

S.NO.	AGE (YEARS)	NUMBER OF CASES (150) %
1	0-10	32 (21.33%)
2	11-20	25 (16.66%)
3	21-30	18 (12%)
4	31-40	18 (12%)

5	41-50	32(21.33%)
6	51-60	09(6%)
7	61-70	08(5.33%)
8	71-80	07(4.66%)
9	>80	01(0.66%)

Table third shows maximum number of cases bone marrow cellularity hypercellular 72(48%), followed by normocellular 45(30%), hypocellular 17(11.33%) and minimum cases were mixed(diluted) 16(10.66%)

TABLE :3 BONE MARROW ASPIRATE CELLULARITY

S.NO.	MARROW CELLULARITY	NO. OF CASES(%)
1	Hypercellular	72(48)
2	Hypocellular	17(11.33)
3	Normocellular	45(30)
4	Mixed	16(10.66)

Clinical findings of the cases, pallor and dyspnea cases 105(70%) were the most common complained, 52% cases had fever, 44.66% presented with splenomegaly/hepatomegaly, 28.66% cases had lymphadenopathy and 8.66% cases complained bleeding mainly from epistaxis, hematochezia, petechiae and mucosal bleeding.

TABLE:4 Clinical findings of the cases

S.NO.	Clinical findings	Number of patients(%)
1	Fever	78(52)
2	Pallor and dyspnea	105(70)
3	Lymphadenopathy	43(28.66)
4	Splenomegaly/hepatomegaly	67(44.66)
5	Bleeding manifestation	13(8.66)

DISCUSSION:

Bone marrow is one of the body largest organ and one of the most important pillar in diagnosing haematological disorder^{4,13}.

Male to female ratio in our study is 1:1.

In present study we found most of the bone marrow aspiration hypercellular 72 cases(48%) , Gohil et al (4) were found BMA hypercellular(60.17%) which is comparable to Marwah et al¹⁵.

In our study CML was the most common haematological disorder 40% cases. Our study findings is similar study of Bordia et al all findings followed by second most common leukaemia ALL 18.61% which is similar findings of study of Anuradha et al and Gohil et al⁷.

Third findings in our study 13.3% cases of nutritional anemia(iron deficiency and megaloblastic anemia) and Mahajan V. et al were found 18.47% cases of megaloblastic anemia in BMA¹¹.

In our study 23.9% cases were acute leukaemia while 49.3% cases chronic leukaemia, study conducted by Singh G et al, were acute leukaemia are more common than chronic leukaemia. (ALL>AML) is more common in our study, the similar observation was also observed by Rego MF et al^{7,10}.

In our study 6(4%) cases of ITP observed, while 11.5% cases were observed in Gohil et al study⁷.

In our study Multiple myeloma cases 2.6% ,similar findings were observed in Bordia et al study¹².

In present study Metastatic cases (2.6%), D Ghartimagar et al in their study showed metastasis (6%), in our study granuloma cases(1.3%) similar findings consistent with Vijaymohan L et al (14) ,in our study MDS cases (1.3%) and Lymphoma cases (0.6%) cases found, dissimilar study observed in Vidisha et al study metastasis 1 case, MDS 5 cases, granuloma 8 cases, Lymphoma 54 cases¹¹.

A rare case of sickle cell with necrosis in bone marrow aspiration is present in our study, similar case was observed in sameera et al study¹⁶.

CONCLUSIONS:-

Bone marrow examination is an important and confirmatory investigation of many haematological and non-hematological disorders that can be confirmed by more advanced investigation viz. Serological, biochemical, or molecular. The study provides a valuable insight into the causes of anemia or pancytopenia in our country.

However, bone marrow sample cannot be obtained (dry tap) in a proportion of cases. In such cases, a bone marrow biopsy needs to be performed. Bone marrow examination plays a role in initiation of treatment, control, cure of the disease and also useful for the follow up the patients undergoing therapy.

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