

Utility of Bone Marrow Examination in a Secondary Care Hospital

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Abstract

Background: To analyze utilization of bone marrow examination in a secondary health care hospital.

Methods: In this observational study bone marrow examination and interpretation was done in the light of patients' clinical history and relevant laboratory investigations. Patients were followed up to see any complications due to bone marrow aspiration and trephine procedures.

Results: Pancytopenia (29.8%) and unexplained anaemias (28.6%) were the commonest indications. Anaemias due to nutritional deficiencies (42.8%) and haematological malignancies (29.7%) were the commonest diagnosis. No complications were seen in any of the patients.

Conclusions: Nutritional deficiencies were the commonest diagnosis, even though they can be prevented.

Key Words: Bone marrow examination, Dry tap,

Introduction

Bone marrow examination (BME) is an invasive, but a very informative investigation if carried out in the backdrop of an appropriate indication. Although its main utility is in the diagnosis of various haematological and marrow-involving non-haematological diseases, it is also used for staging and monitoring of treatment of haematological tumours.¹ Bone marrow (BM) aspirate and trephine biopsy provide information complementary to one another. The facility for these tests is presently available in bigger cities and only in a handful of centers in Pakistan. We carried out a study to analyze the utilization of BME in our secondary care hospital during a period of one year in order to see (a) the range of indications prompting request for BME (b) spectrum of diagnoses made and (c) complications of BM procedure.

Patients and Methods

All the patients referred from PAF hospital

Mianwali and various private clinics and hospitals in Mianwali district from 1 July 2009 to 30 June 2010 were included in the study. History was obtained, clinical examination was carried out and findings were recorded. Complete blood counts (CBC) of the patients were done on automated haematology analyzer. Peripheral blood smears were prepared and stained with Leishman stain. Bone marrow aspiration and trephine were done and samples were processed in a standard manner.^{2,3}

Results

A total of 84 patients were subjected to BME. Number of male and female patients were 44 and 40 respectively. Patients ranged in age from 8 months to 106 years. Pancytopenia (29.8%) was the commonest indication to perform bone marrow examination (Table 1). Nutritional deficiency anaemias (42.8%) were the commonest diagnosis (Table 2). Seven cases revealed dry/blood tap (Table 3)

Table-1: Indications for bone marrow examination

Indications	Number	Percentage
Pancytopenia	25	29.8
Anaemia	24	28.6
Bicytopenia	12	14.3
Leukocytosis	08	9.5
Splenomegaly	07	8.3
Pyrexia of unknown origin	06	7.1
Thrombocytopenia	02	2.4
Total	84	

Discussion

The common indications for BME include unexplained cytopenias, leukocytosis due to suspected leukaemias, leukoerythroblastic picture raising suspicion of BM infiltration, treatment monitoring and staging of some malignancies, unexplained splenomegaly, pyrexia of unknown origin and assessment of iron stores.¹ Pancytopenia is apparently a very sinister finding, but in present series majority of

cases of pancytopenia (60%) were due to megaloblastic anaemia and hypersplenism.

Anaemia is one of the major health problems affecting almost 25% of the world population while iron

Table-2: Bone Marrow Examination: Diagnostic Entities (n=84)

Diagnostic entities	Number(%)
A: Deficiency anaemias: (n=36)	
Iron deficiency anaemia	20(23.8)
Megaloblastic anaemia	10(11.9)
Mixed deficiency anaemia	6(7.1)
B: Haematological malignancies: (n= 25)	
Chronic myeloid leukaemia	5(5.9)
Chronic lymphocytic leukaemia	5(5.9)
Acute myeloid leukaemia	5(5.9)
Acute lymphoblastic leukaemia	3(3.6)
Multiple myeloma	1(1.2)
Myelodysplastic syndrome	3(3.6)
Marrow showing abnormal lymphocytic infiltrate	2(2.4)
Myeloproliferative disorder	1(1.2)
C: Reactive changes to systemic disorders (n=11)	
Anaemia of chronic disorder	4(4.8)
Hypersplenism	5(5.9)
Myeloid Hyperplasia/ leukaemoid reaction	2(4)
D: Bone marrow failure syndromes (n=6)	
Aplastic anaemia	4(4.8)
PRCA*	1(1.2)
Megakaryocytic hypoplasia	1(1.2)
E: Marrow showing metastasis	2(2.4)
F: Haemolytic anaemia	2(2.4)
G: Bone marrow showing Granuloma	1(1.2)
H: Malaria	1(1.2)

*Pure Red Cell Aplasia

deficiency is globally the commonest cause of anaemia.⁴ Iron deficiency anaemia (IDA) and megaloblastic anaemia can be suspected on the basis of clinical history, socioeconomic background of the patient, clinical examination and findings of red blood cells' morphology and indices. Diagnosis can be confirmed by means of relevant biochemical tests such

as serum ferritin, total iron binding capacity and serum iron assays for IDA; and folic acid and B12 assays for megaloblastic anaemia. In our set up facilities for biochemical investigation are unfortunately not available at most of the secondary health care facilities. Ultimately one resorts to perform bone marrow examination to make a diagnosis of these deficiency anaemias.¹

Table-3: Trepine biopsy findings in cases of dry tap/blood tap (n=7)

Diagnosis	Number
Metastasis	2
Abnormal lymphocytic infiltrate	2
Casating granuloma	1
Myeloproliferative disorder	1
Acute lymphoblastic leukaemia	1
Total	7 (8.%)

Dry tap or blood tap is usually because of some pathology in the marrow and rarely because of faulty technique. Bone marrow trephine is mandatory in all such cases. Bone marrow aspiration and trephine biopsy procedures are rarely followed by complications, but one case mortality has been reported due to retro-peritoneal bleeding.⁵

Conclusion

There is a definite need to make this facility available at the secondary health care facilities.

References

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