



ORIGINAL RESEARCH PAPER

Pathology

A PROSPECTIVE STUDY ON BONE MARROW ASPIRATION AS AN IMPORTANT DIAGNOSTIC PROCEDURE – AT TERTIARY CARE HOSPITAL

KEY WORDS: BM (Bone Marrow), M:F (Male: Female), MDS (myelodysplastic syndrome).

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ABSTRACT

Background: Bone marrow aspiration has been a useful tool in determining hematological disorders . It is relatively safe procedure which can be performed on outpatient basis. **Objectives:** To study the spectrum of lesions on bone marrow aspiration. **Methods:** The study was conducted in the department of pathology, Gajraraja Medical College , Gwalior (M.P) . This prospective study was conducted over a period of 2.5 years(January 2020 to july 2022). It Results: In present study 149 cases of bone marrow aspirations were done over a period of 2.5 years. Malignant cases (26.17%) outnumbered benign cases (51%). Nutritional anemia was common among anemias . Acute leukemia was commonest among malignant cases. **Conclusion:** Bone marrow aspiration is an important, rapid and cost effective tool in diagnosis hematological disorders and to some extent in non hematological disorders.

INTRODUCTION

Bone marrow examination is an important and trustable procedure by which a precise diagnosis can be made in field of hematology when complemented by thorough clinical assessment, basic haematological investigations together with blood film examination and targeted biochemical, microbiological, and radiological investigations. [1].

Examination of the bone marrow forms the cornerstone of diagnosis and management in myriad clinical situations, both hematological and otherwise. Complete marrow assessment entails two separate but complementary investigations. The first is cytological evaluation of cells that have been aspirated and smeared.

This allows for high-quality visualization of cell morphology and enables differential counts. The second is percutaneous needle biopsy of bone marrow (with touch/ imprint preparations) that allows histological assessment of cellularity, fibrosis, infections, infiltrative disease and diseases of the bone and its cells. [2]

A clinically indicated marrow extraction procedure should be performed by trained persons following stringent and standard guidelines.

The Department of pathology , gajra Raja medical college is well-equipped and has facilities to perform haematological investigations. Annually, thousands of cases are referred to the Approximately average 75 bone marrow examinations are carried out in this unit in a calendar year.

Indications for bone marrow examination include evaluation of unexplained anaemia, neutropenia, thrombocytopenia, pancytopenia, leucoerythroblastic blood film or suspected bone marrow infiltration, suspected acute leukaemia, myelodysplastic syndrome (MDS), myeloproliferative neoplasm (MPN), chronic lymphocytic leukaemia (CLL), plasma cell myeloma (PCM), lymphoma, staging of lymphoma and fever of unknown origin (FUO).

This study was performed to determine the haematological and non haematological disorders which warranted bone marrow aspiration and biopsy, assess the

diagnostic yield and describe the distribution of haematological disorders diagnosed on bone marrow examination at a tertiary care centre in gwalior region of Madhya Pradesh, India .

METHODOLOGY

This was a prospective study over a period of 2.5 years(January 2020 to july 2022) in the Central Pathology Lab, Department of Pathology at Gajra Raja Medical College, Gwalior. Bone marrow aspiration was done using Salah needle. Bone marrow examination was carried out after taking informed written consent by trained and competent medical officers under aseptic conditions according to the standard operative procedure from the posterior superior iliac crest using local anaesthesia.

Bone marrow was evaluated after taking in detailed clinical history with features like pallor, liver and spleen size, lymphadenopathy, history of drug intake, bone pains, bleeding etc. General anaesthesia was used in children. No immediate or long-term complications were reported. Films of aspirated marrow made at the bedside and fixed once they were thoroughly dry. Leishman stain was used routinely.

RESULTS

In present study 149 cases of bone marrow aspirations were done over a period of 2.5 years. The age ranged from 1 to 76 years with median age of 14.38 years. Males outnumbered females with M:F of 1.56:1. 22.8% of cases were inadequate to make opinion.

Among benign cases ,nutritional deficiency anaemia was most common 53 cases (35.6%)in which megaloblastic anemia 26 cases (17.4%)was the most common finding followed by mixed nutritional deficiency anemia, 20 cases (13.4%) and iron deficiency anaemia 7 cases (4.7%) (Fig-1). Other causes were Hypoplastic marrow 6 cases (4%), ITP 5 cases (3.35%) ,Aplastic anemia 4 cases (2.68 %) ,Erythroid hyperplasia 4 cases(2.68%).

Individual case of hemolytic anemia was also reported . Also in a single case cause of pancytopenia couldnt be ruled out and was reported broadly as pancytopenia.

Among malignant cases leukemia in which acute myeloid leukemia to be specific was the most common finding .

Commonest myeloproliferative lesion in our study was chronic myeloid leukemia followed by essential thrombocythemia and myelofibrosis. Most common presentation in myeloproliferative neoplasm was massive splenomegaly. 6.76% cases were labelled as myelodysplastic syndromes.

Bone marrow examination is not required to make diagnosis of Chronic lymphocytic leukemia except in cases with cytopenias. In our study we found only one of CLL. Most of these cases were already diagnosed cases of CLL on treatment who presented with sudden onset cytopenias.

CONCLUSION

Bone marrow examination is an important, rapid and cost effective tool for diagnosis when supplemented with proper history , clinical assessment and other relevant selected investigations. Anemias (especially due to nutrition deficiency) were the commonest disorder amongst the benign haematological disorders, were as Acute leukaemia was the most common malignant haematological disorder. It plays an important role in the field of haematology for both diagnosis and follow up.

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