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Original Research Article

Clinico-haematological profile of adult pancytopenia patients at a tertiary care institute in South India

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ABSTRACT

Background: Pancytopenia is not a disease by itself; rather it describes simultaneous presence of anemia, leukopenia and thrombocytopenia resulting from a number of disease processes. Varieties of hematological and non-hematological disorders may affect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia. The incidence of various hematological disorders causing pancytopenia varies due to geographical distribution and genetic predisposition. This study highlights the spectrum of causes, clinical presentation and bone marrow morphology of pancytopenia.
Methods: This prospective observational study was conducted for a period of two years at Al-Ameen Medical College, Bijapur, Bangalore. During this period, fifty patients with a hematological diagnosis of pancytopenia were studied during period in the department of pathology.
Results: Among the 50 cases studied, 35 were males and 15 were females. Most of the patients presented with generalized weakness and fever. The commonest physical finding was pallor, followed by splenomegaly and hepatomegaly. Dimorphic anemia was predominant blood picture. Bone marrow study showed 72% hypercellular marrow, 12% normocellular and 16% hypocellular marrow. The commonest cause for pancytopenia was megaloblastic anemia followed by iron deficiency anaemia and malaria.
Conclusions: The present study concludes that detailed hematological investigations along with bone marrow examination in pancytopenic patients is helpful to diagnose or rule out the causes of pancytopenia.

Keywords: Leucopenia, Megaloblastic anemia, Pancytopenia

INTRODUCTION

Pancytopenia is defined by reduction in all three formed elements of blood, below the normal reference range.[1] Varieties of hematological and non-hematological disorders may affect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia.[2] The incidence of various hematological disorders causing pancytopenia varies due to geographical distribution and genetic predisposition.[3] Acute megaloblastic anemia is an important cause of pancytopenia occurring rapidly in critically ill patients due to acute folic acid deficiency.[4]

Pancytopenia is the simultaneous presence of anemia, leukopenia and thrombocytopenia, therefore it exists when hemoglobin is less than 13.5 gm/dl in males, 11.5 gm/dl in females, the WBC count $<4\times10^9$/l and platelet count$<150\times10^9$/l.[5] Presenting symptoms are usually attributable to anemia, leukopenia or thrombocytopenia. Anemia leads to fatigue, dyspnea and cardiac symptoms. Thrombocytopenia leads to bruising, mucosal bleeding

and neutropenia to sharply increased susceptibility to infection.[5] Pancytopenia is not a disease entity but a triad of findings that may result from number of disease processes.[6] Hemogram and bone marrow examination necessitate critical evaluation of hematological disorders to reach a definitive diagnosis. Emphasizing the importance of systematic and meticulous examination of hemogram to render definitive diagnosis is necessary. Diagnostic clues obtained from hemogram and bone marrow examination was useful in early diagnosis of disease and had better prognosis in majority of cases. The management and prognosis of pancytopenia depends on the underlying etiopathology. Hence the finding of correct etiopathology in a given case is crucial. Current study aimed to find the underlying etiology and clinical profile of adult pancytopenia patients.

METHODS

This prospective observational study was conducted for a period of two years (August 2012 to July 2014) in the department of pathology at Al-Ameen Medical College, Bijapur, Bangalore. A total of 50 patients with a hematological diagnosis of pancytopenia were studied. All the patients were meticulously examined for having any pallor, jaundice, hepatomegaly, splenomegaly and lymphadenopathy. Basic investigation was performed for each patient included; hemoglobin level, total leukocyte count, platelet count, and reticulocyte count. Absolute values including packed cell volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration were calculated for every patient. Chest radiography and abdominal ultrasonography were done in selected patients. Peripheral smear examination, and bone marrow examination was done in all patients, and wherever required, a trephine biopsy was also performed.

Inclusion criteria

Adults aged between 15-70 years. Cases showing the parameters as hemoglobin of <10 gm per dl, white blood cell count $<4\times10^9$, and platelet count $<150\times10^9$ were included in this study

Exclusion criteria

Patients <15 years and >70 years were excluded. Patients with severe thrombocytopenia (less than 10,000 cells/cumm) or patients with known bleeding disorders.

RESULTS

Most of the patients were in the age group of 15-25 years (40%) and least occurrence was seen in the age group of 66-70 years (6%) as depicted in Table 1. 70% of patients in our study were males as depicted in Figure 1.

The most common clinical feature in our case series of pancytopenic patients was generalized weakness (92%) followed by fever (66%), and dyspnea (48%). The most common physical finding was pallor (92%), followed by splenomegaly (36%), and hepatomegaly (26%) as depicted in Figures 2 and 3.

Table 1: Distribution of patients with respect to various age-groups.

Age group (years)	N (%)
15-25	20 (40)
26-35	10 (20)
36-45	7 (14)
46-55	5 (10)
56-65	5 (10)
66-70	3 (6)

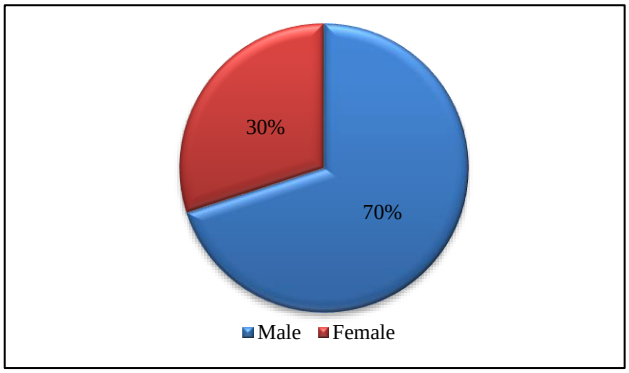

Figure 1: Showing sex distribution of patients.

Peripheral blood smear of pancytopenic patients revealed dimorphic anemia in 52% of cases followed by microcytic anemia in 30% cases. Macrocytic anemia was seen in 14% cases while normocytic anemia was seen in only 4% of cases.

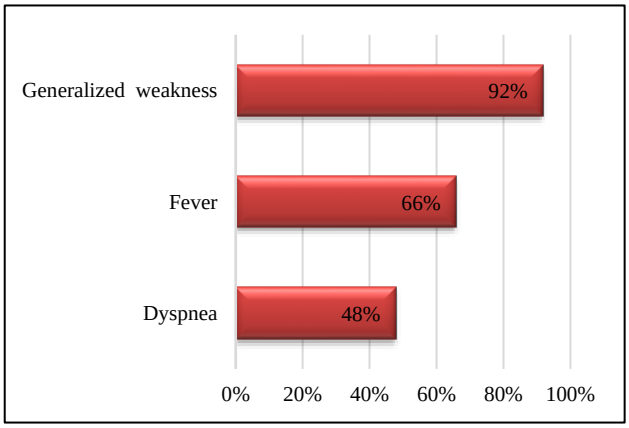

Figure 2: Bar chart depicting commonest presenting symptoms among pancytopenic patients.

Bone marrow examination revealed hypercellular marrow in 72% cases while hypocellular marrow was seen in 16%. 12% of cases also revealed normocellular marrow.

The most common cause of pancytopenia was megaloblastic anemia (66%), followed by iron deficiency

anemia (16%), malaria (8%),followed by undiagnosed cases of leukemia (4%), and multiple myeloma (2%), aplastic anemia (2%) and myelofibrosis (2%) as depicted in Table 2.

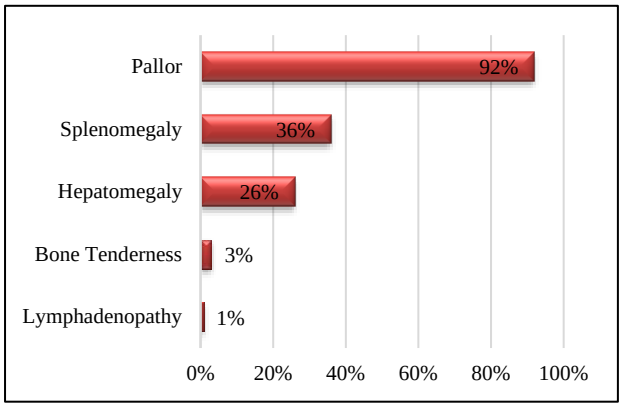

Figure 3: Bar Chart depicting commonest physical findings among pancytopenic patients.

Table 2: Common causes of pancytopenia among the study participants.

Cause of pancytopenia	N (%)
Megaloblastic anemia	33 (66)
Iron deficiency anemia	8 (16)
Malaria	4 (8)
Leukemia	2 (4)
Multiple myeloma	1 (2)
Aplastic anemia	1 (2)
Myelofibrosis	1 (2)

DISCUSSION

Pancytopenia is defined by reduction in all three formed elements of blood, below the normal reference range.[1] Varieties of hematological and non-hematological disorders may affect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia.[2]

There is variation in etiological causes of pancytopenia in different population studies which can be attributed to various factors like genetic variation, presence of infective disorders, nutritional status and methodology of that study etc.

Majority of patients (70%) in our study were males. All the patients studied in our study were aged between 15 and 70. Almost similar to our study Jalbani et al studied patients between 13 and 65 whereas Ashraf et al included patients aged between 15 and 65 years.[7,8]

In our study majority of patients presented with generalised weakness followed by fever and dyspnea. As far as clinical features are concerned pallor was present in 92% of cases, splenomegaly in 36%, hepatomegaly was present in 26% of patients and bleeding abnormalities was seen in 10% of patients. Shazia et al reported pallor in 87% and fever in 65% of studied patients.[9] Other presenting symptoms were bruises or purpuric spots on the body, epistaxis, hemetemesis, malena, petechial hemorrhages and hematuria. Khodke et al in their study reported pallor in all the patients.[10] Splenomegaly was seen in 40% and hepatomegaly in 38% petechial haemorrhages were present in 28%.

Our study showed that major cause of pancytopenia was megaloblastic anemia 66% followed by Iron deficiency anaemia and malaria 8%. Our study was consistent with study conducted by Kumar et al who reported four major causes of pancytopenia as aplastic anemia followed by megaloblastic anemia, aleukemic leukemia or lymphoma.[3] Ishtiaq et al studied 100 patients having pancytopeania and encountered 5 cases of iron deficiency anemia 5% as 4th common cause in his study which was comparable with our study where we also encountered 8 cases of iron deficiency anemia manifesting with pancytopenia.[11]

CONCLUSION

The present study concludes that detailed hematological investigations along with bone marrow examination in pancytopenic patients is helpful to diagnose or rule out the causes of pancytopenia and further planning of investigation and management.

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Conflict of interest: None declared
Ethical approval: The study was approved by the Institutional Ethics Committee Al-Ameen Medical College, Bijapur

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