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Original Research

Assessment of clinical and etiologic profile of patients with pancytopenia

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***ABSTRACT*:**
Background: Pancytopenia is characterized by a decreased number of at least two blood cell lines. The aim of this study was to evaluate the clinical presentation and etiological spectrum pancytopenias. **Materials & methods:** This was a prospective study conducted on 100 cases of age above 18 years who present to Dr DY Patil Medical College & Hospital and were found to have pancytopenia during hospital stay. Detailed history was taken. Relevant past and family history was taken. Findings of general and local examination were recorded wherever available. The results of routine investigations like CBC, RFT, LFT were recorded in all cases. The results of serum folate, serum B 12 level, ANA, Ultrasound Abdomen, Bone marrow aspiration and biopsy and other investigations done to reach to the diagnosis of pancytopenia were recorded. **Results:** Mean age of the patients was 41.84 years. 61 percent of the patients were males while the remaining were females. Pallor and generalized weakness was seen in 100 percent and 97 percent of the patients. Fever was present in 60 percent of the patients. Hepatomegaly, splenomegaly and lymphadenopathy were seen in 31 percent, 21 percent and 22 percent of the patients respectively. Megaloblastic anaemia was the most common etiologic factor found to be present in 63 percent of the patients. Dimorphic anaemia was found to be present in 12 percent of the patients while aplastic anaemia and sepsis were found to be present in 10 percent and 8 percent of patients respectively. Malaria and multiple myeloma were found to be present as etiologic factor in 5 percent and 2 percent of the patients respectively. **Conclusion:** Pancytopenia is not an uncommon hematological condition and is observed often in the clinical practice. Megaloblastic anemia was the major contributor to cause this condition followed by aplastic anemia. In terms of clinical presentations, the most common was pallor, followed by loss of weight, dyspnoea, fever. Other contributors were hepatomegaly, splenomegaly and weakness.
Key words: Pancytopenia, Profile

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INTRODUCTION

Pancytopenia is characterized by a decreased number of at least two blood cell lines. Pancytopenia may progress acutely, such as with decreased blood cell counts in fulminant sepsis, disseminated intravascular coagulation, or rapid hemolysis. Alternatively, pancytopenia may evolve insidiously over weeks to months.[1] As pancytopenia is a laboratory finding, and not a particular diagnosis, it has a broad differential diagnosis. On one hand it may be the only manifestation of an easily treatable disease like B12 deficiency but on the other hand it may be the striking feature of a life threatening condition like leukemia. The pathophysiological mechanisms to explain pancytopenia can be simplified by dividing the causes into two broader categories. Most often it is caused by decreased production of multiple cell lineages from primary dysfunction of marrow or the stem cells. Rarely is it caused by destruction or sequestration of cell lines in the periphery. Sometimes, the same disease produces pancytopenia by overlapping the mechanisms. Hypersplenism is the commonest cause for pancytopenia without primary deficits in the marrow or the stem cells.[2-4]

The clinical features depends upon both of the underlying disease process as well as relate to the blood cell lineages affected. Patients with mild pancytopenia are often asymptomatic and in most instances it goes unnoticed unless complete blood count is ordered for some other reason. Or the patients

can present with life threatening infection or catastrophic bleeding manifestations. Symptomatic pancytopenia is more common in patients with primary dysfunction of the bone marrow or the stem cells.[5- 7] The aim of this study was to evaluate the clinical presentation and etiological spectrum pancytopenias.

MATERIALS & METHODS

This was a prospective study conducted on 100 cases of age above 18 years who present to Dr DY Patil Medical College & Hospital and were found to have pancytopenia during hospital stay. Detailed history was taken. Relevant past and family history was taken. Findings of general and local examination were recorded wherever available. The results of routine investigations like CBC, RFT, LFT were recorded in all cases. The results of serum folate, serum B 12 level, ANA, Ultrasound Abdomen, Bone marrow aspiration and biopsy and other investigations done to reach to the diagnosis of pancytopenia were recorded. All the results were analysed by SPSS software version 18 0 Chi square test and Mann Whitney U test were used for assessment of level of significance P value of less than 0 05 were taken as significant.

RESULTS

Mean age of the patients was 41.84 years. 61 percent of the patients were males while the remaining were females. Pallor and generalized weakness was seen in 100 percent and 97 percent of the patients. Fever was present in 60 percent of the patients. Hepatomegaly, splenomegaly and lymphadenopathy were seen in 31 percent, 21 percent and 22 percent of the patients respectively. Breathlessness, bone pain, weight loss and bleeding were seen in 3 percent, 3 percent, 2 percent and 8 percent of the patients respectively. Hypercellular bone marrow, Hypocellular bone marrow and Normocellular bone marrow was seen in 82 percent, 15 percent and 3 percent of the patients respectively.

Table 1: Clinical profile

Clinical profile	Number of patients	Percentage of patients
Fever	60	60
Generalized weakness	97	97
Breathlessness	3	3
Bone pain	3	3
Weight loss	2	2
Dyspnoea	43	43
Bleeding	8	8
Pallor	100	100
Hepatomegaly	31	31
Splenomegaly	21	21
Lymphadenopathy	22	22

Megaloblastic anaemia was the most common etiologic factor found to be present in 63 percent of the patients. Dimorphic anaemia was found to be present in 12 percent of the patients while aplastic anaemia and sepsis were found to be present in 10 percent and 8 percent of patients respectively. Malaria and multiple myeloma were found to be present as etiologic factor in 5 percent and 2 percent of the patients respectively.

DISCUSSION

Pancytopenia is a hematological condition which is characterized by decreases in all three cellular elements: RBC, WBC, and platelets. It is defined as hemoglobin less than 13.5 g/dl in males or 11.5 g/dl in females, leucocyte count less than 4.5×109/L, and platelet count less than 15×109/L. Pancytopenia can be life threating and may evolve insidiously in some cases. The causes of pancytopenia vary widely in different studies. It is a common hematological problem encountered in clinical practice, which has multiple causes and the underlying pathology determines the management and prognosis of the patients.

Table 2: Bone marrow cellularity

Bone marrow cellularity	Number of patients	Percentage of patients
Hypercellular	82	82
Hypocellular	15	15
Normocellular	3	3
Total	100	100

Table 3: Causes of pancytopenia

Causes of pancytopenia	Number of patients	Percentage of patients
Megaloblastic anaemia	63	63
Dimorphic anaemia	12	12
Aplastic anaemia	10	10
Sepsis	8	8
Malaria	5	5
Multiple myeloma	2	2
Total	100	100

The evaluation of the cause of pancytopenia starts from history, physical examination and various laboratory investigations including basic hematological, biochemical, radiological, and histopathological investigations. Bone marrow examination is simple and safe invasive procedure, which causes a moderate discomfort and can be performed easily. Its great utility is for investigating and it is an important diagnostic modality for evaluating the cases of pancytopenia.[6- 9] Hence; under the light of above obtained data, the present study was undertaken for assessing the clinical and etiological profile and outcome of patients with Pancytopenia

In the present study, 29 percent and 25 percent of the patients belonged to the age group of less than 30 years and 30 to 40 years respectively. 16 percent and 15 percent of the patients belonged to the age group of 41 to 50 years and 51 to 60 years respectively. Mean age of the patients was 41.84 years. In the present study, Pallor and generalized weakness was seen in

100 percent and 97 percent of the patients. Fever was present in 60 percent of the patients. Hepatomegaly, splenomegaly and lymphadenopathy were seen in 31 percent, 21 percent and 22 percent of the patients respectively. Breathlessness, bone pain, weight loss and bleeding were seen in 3 percent, 3 percent, 2 percent and 8 percent of the patients respectively.

In a study conducted by Mohanty N et al, fever, generalized weakness, weight loss, Dyspnea, bleeding, pallor, lymphadenopathy and hepato-splenomegaly were seen in 75.3 percent, 93.3 percent, 10.7 percent, 54 percent, 18 percent, 100 percent, 43.3 percent and 32 percent of the patients with pancytopenia respectively.[10] Khan and Hasan showed 81% cases with pallor followed by fever and bleeding manifestation as the most common presentations in their study. Naseem et al. showed fever (65.5%) was the most common presentation followed by pallor and hepatomegaly.[11, 12] Dhooria, H. P. S, in their study, reported that the most common general physical finding was pallor which included 190 patients (95%). The 2nd and 3rd most common findings on general physical finding were splenomegaly (44 patients,22%) and hepatomegaly (34 patients, 17%) respectively.[13]

In the present study, Hypercellular bone marrow, Hypocellular bone marrow and Normocellular bone marrow was seen in 82 percent, 15 percent and 3 percent of the patients respectively. In a study conducted by Mohanty N et al, Hypercellular bone marrow, Hypocellular bone marrow and Normocellular bone marrow was seen in 37.5 percent, 41.7 percent and 20.8 percent of the patients respectively. Dhooria HPS et al, in another study, reported that out of 200 patients, bone marrow biopsy was done in 191 patients. Out of 191 patients, hypercellular marrow was seen in 82 patients (42.9%), normocellular marrow was seen in 58 patients (30.3%) and hypocellular marrow was seen in 51 patients (26.7%).[11- 13]

In the present study, Megaloblastic anaemia was the most common etiologic factor found to be present in 63 percent of the patients. Dimorphic anaemia was found to be present in 12 percent of the patients while aplastic anaemia and sepsis were found to be present in 10 percent and 8 percent of patients respectively. Malaria and multiple myeloma were found to be present as etiologic factor in 5 percent and 2 percent of the patients respectively. Yadav et al found an incidence of megaloblastic anaemia to be 35.84%, while Reddy et al of 38.1%. A very high incidence of 68% of megaloblastic anaemia was reported by Tilak et al in their study. In the study by Agarwal et al, aplastic anemia was the second most common cause of pancytopenia accounting for 14.28%.[14- 17] In a study conducted by Mohanty N et al, megaloblastic anaemia, aplastic anaemia, sepsis and malaria were the etiologic factor in 20 percent, 28 percent, 1.34 percent and 13.3 percent of the patients respectively.[10]

In a study conducted by Yadav et al, out of various etiological causes vitamin B12 deficiency was the commonest in our study. 48(51%) patients had megaloblastic anemia due to vitamin B12 deficiency. Second most common etiological factor was hypo plastic/aplastic anemia, which was present in 13(13.82%) patients. Other etiological abnormalities were hypersplenism, dengue, malaria, sepsis, myelodysplastic syndrome and multiple myeloma.[14]

In a previous study conducted by Yokuş O et al, authors etiological causes of pancytopenia in patients who were admitted to the hematology ward due to pancytopenia. A total of 137 patients were evaluated. The etiological causes of pancytopenia were recorded as Vitamin B12 deficiency (n: 24; 17%), chronic liver disease (n: 21; 15%), malignancy (n: 19; 13%), myelodysplastic syndrome (n: 18; 13%), aplastic anemia (n: 11; 8%), rheumatic diseases (n: 7; 5%), and endocrine causes (n: 3; 2%). The etiological causes of pancytopenia vary depends on patients' age, gender, country, and other conditions. Vitamin B12 deficiency is the most common treatable cause of pancytopenia.[18]

CONCLUSION

Pancytopenia is not an uncommon hematological condition and is observed often in the clinical practice. Megaloblastic anemia was the major contributor to cause this condition followed by aplastic anemia. In terms of clinical presentations, the most common was pallor, followed by loss of weight, dyspnoea, fever. Other contributors were hepatomegaly, splenomegaly and weakness.

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