Scholars Journal of Applied Medical Sciences (SJAMS) **ISSN 2320-6691 (Online)**
Sch. J. App. Med. Sci., 2015; 3(5B):1926-1928 **ISSN 2347-954X (Print)**

(An International Publisher for Academic and Scientific Resources)
www.saspublisher.com

Research Article

Pancytopenia- a clinical and etiological study

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Abstract: Pancytopenia is a common hematological condition in clinical practice which is characterized by the simultaneous presence of anemia, leukopenia and thrombocytopenia. It can be caused by a variety of conditions some of which are reversible. The present study was undertaken to evaluate the clinical profile and etiology of pancytopenia and was focused on identifying the reversible causes of pancytopenia. It also focussed on the clinico-hematological profile of patients with megaloblastic anemia. 50 patients of pancytopenia admitted in Vydehi Institute of Medical Sciences and Research Centre in the department of medicine over a period of 1 year from Oct 2013 to Oct 2014 were studied. The most common causes of pancytopenia in our study were megaloblastic anemia and hypersplenism each of which were seen in 20% of patients. This was followed by aplastic anemia which was seen in 16% of patients**.** While evaluating a case of pancytopenia one should look for a reversible cause such as megaloblastic anemia or infections.
Keywords: Pancytopenia, Megaloblastic anemia, Aplastic anemia, hypersplenism.

INTRODUCTION

Pancytopenia is defined as the simultaneous presence of anemia, leukopenia and thrombocytopenia. The mechanism of development of pancytopenia varies from decrease in hematopoietic cell production as in aplastic anemia, trapping of normal cells in hypertrophied and overactive reticuloendothelial system as in hypersplenism, ineffective hematopoiesis as in megaloblastosis or replacement by abnormal or malignant tissue in the marrow[1]. Patients usually present with complaints attributed to anemia, thrombocytopenia and rarely leukopenia which in later stages is responsible for downhill course. Major diagnostic problems occur when there are no specific features in the blood to suggest the diagnosis or when the clinical features are not sufficiently specific to point to the cause.[2]As the severity of pancytopenia and the underlying pathology determines the management and prognosis of these patients, identifying the correct etiopathology in a given case is crucial and helps in implementing timely and appropriate treatment.[1] The present study is focused on identifying easily treatable and reversible causes of pancytopenia.

AIMS AND OBJECTIVES

1. To study the clinical profile of a patient with pancytopenia.
2. To study the underlying aetiology of the pancytopenia.

MATERIALS AND METHODS

This study included 50 patients of pancytopenia admitted in Vydehi Institute of Medical Sciences and Research Centre in the department of medicine over a period of 1 year from October 2013 to 2014. Patients who met the inclusion criteria were included in the study.

Inclusion criteria

1. Age >15years
2. Anemia (Hb < 12g/dl)
3. Leukopenia (total count <4000/dl)
4.Thrombocytopenia (platelet count < 1,50,000)

Exclusion criteria

1. Patients who have received or are receiving cancer chemotherapy
2. Patients who have received or are receiving radiotherapy

A detailed relevant history and a meticulous physical examination was done for all patients. Complete blood count (haemoglobin [Hb], total leucocyte count, differential leucocyte count, platelet count, MCV,MCH,MCHC) as well as peripheral smear was performed in all patients. Bone marrow examination was performed in 29 out of 50 patients. Other investigations were performed in selected cases according to their provisional diagnosis, including

malarial parasite and antigen, dengue serology, vitamin B12 and folic acid assay, anti-nuclear factor, liver function test, enzyme-linked immunosorbent assay for the human immunodeficiency virus (HIV) I and II, and the hepatitis B surface antigen (HBsAg).

RESULTS

The study was conducted on 50 patients of pancytopenia admitted in our hospital who met the inclusion and exclusion criteria. The commonest age group affected in our study was 15-30 years and least age group affected was 61- 75 years. The male: female ratio noted in our study was 1.6 : 1. The most common presenting symptom was easy fatiguability which was seen in 96% of patients. It was followed by fever seen in 64% of patients. Bleeding manifestations were seen in 18 % of the patients. Pallor was seen in all 100 patients. Splenomegaly was seen in 20% of patients.

Hemoglobin was found to be < 5gm/dL in 32%, 5-8 gm/dl in 52% and > 8gm/dL in 16% of patients. Total leukocyte count was <2000/µ L in 18% and 2000- 4000/ µ L in 82% of patients. Platelet count was <50000/ µ L in 50%, 50000- 100000/ µ L in 40% and 100000- 150000/ µ L in 10%. Bone marrow examination was carried out in 29 patients. Results are as shown in Table 1. It was not done in the remaining 21 patients because diagnosis was already established in them by other investigations.

Table 1: Bone marrow examination findings in pancytopenia patients in our study

Bone marrow examination	No of patients
Megaloblastic anemia	10
Aplastic anemia	9
Acute leukemia	4
Multiple myeloma	1
Myelodysplastic syndrome	1
Lymphoplasmacytic lymphoma	1
Normal marrow	3

The most common causes of pancytopenia in our study are megaloblastic anemia and hypersplenism each of which were seen in 20% of patients. This was followed by aplastic anemia which was seen in 16% of patients. Other causes included acute leukemias, multiple myeloma, lymphoplasmacytic lymphoma, myelodysplastic syndrome, SLE, rheumatoid arthritis, mixed connective tissue disease, sepsis, HIV, malaria and dengue.

Table-2: Etiology of pancytopenia seen in the 50 cases included in our study

Cause	No of patients	Percentage
Megalobalstic anemia	10	20%
Hypersplenism	10	20%
Aplastic anemia	9	18%
Leukemias	4	8%
Multiple myeloma	1	2%
Lymphoplasmacytic lymphoma	1	2%
Myelodysplastic syndrome	2	4%
SLE	3	6%
RA	1	2%
Mixed connective tissue disease	1	2%
Dengue	2	4%
Malaria	4	8%
HIV	1	2%
Sepsis	1	2%

Out of 10 cases of megaloblastic anemia, the commonest age group affected was 46-60 years. Megaloblastic anemia was least common in patients older than 60 years. 80 % of the patients were males and only 20 % were females. Out of the 10 patients, 3 were pure vegetarians. 40% of the patients had splenomegaly. Majority of cases were having hemoglobin< 8gm/dL with average hemoglobin being 5.84 gm/dL, total leukocyte count in the range of 2000-4000/cumm with the average being 2670/cumm and platelet count <100,000cumm with the average being 65400 /cumm. 80% of patients had MCV >100 with 27% of patients having MCV > 120 with the maximum MCV being 140 in one patient.

DISCUSSION

Pancytopenia is a common clinical problem with an extensive differential diagnosis[3].The presenting symptoms are usually attributable to anemia or thrombocytopenia. Leukopenia is an uncommon cause of the initial presentation of the patient but can become the most serious threat to life during the subsequent course of this disorder[4]. Sometimes pancytopenia is detected as an incidental feature of a disorder that is capable of depressing the levels of all cellular elements in the blood[5].

The commonest symptom in a patient with pancytopenia is easy fatiguability and the next common symptom is fever[2,3,5,6]. This is similar to the findings noted in our study. Bleeding manifestations were seen in 18% of the patients in our study. This is unlike the findings noted in 2 other studies where bleeding manifestations were seen in around 40 % of the patients[2,6].

Megaloblastic anemia was the commonest cause of pancytopenia accounting for 48%- 72% of cases in various studies[2,4,5]. In a particular study done in Maharashtra, hypersplenism was the commonest cause of pancytopenia [1]. While 2 other studies reported aplastic anemia as the commonest cause of pancytopenia[3,6]. Other common causes include haematological malignancies, kala-azar, malaria, drugs and other infections[1,2]. In our study we noted that megaloblastic anemia and hypersplenism were the commonest causes of pancytopenia and the next common cause was aplastic anemia.

CONCLUSION

Pancytopenia can be caused by a number of conditions some of which are reversible such as megaloblastic anemia, infections such as dengue, malaria and sepsis. While evaluating a case of pancytopenia one should look for a reversible cause for early and effective management which will reduce the morbidity and anxiety in patients.

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