# Pancytopenia-An Evaluation.

[1]Dr.C.Bharath, [2]Dr.N.Arun Kumar,
*[1]Associate Prof. In Dept. Of Pathology, VIMS, Bellary.*
*Resident,Department Of Pathology, Vijayanagar Institute Of Medical Sciences, Bellary, Karnataka.India*

***Abstract:***
***Objectives:*** *A prospective study, to establish the underlying pathology and evaluation of patients with pancytopenia.*
***Materials and Methods:*** *A total of 11 cases of pancytopenia were analyzed over a period of One month i.e. from 1st August to 31[st]August-05 at Department of Pathology, Vijayanagar Institute of Medical Sciences, Bellary, Karnataka. All patients who presented with pallor, fever, generalized weakness, and diarrhoea were subjected to complete hemogram and were included in the study based upon the laboratory results. Criteria to consider a case to be pancytopenic are hemoglobin <5g/dl, TLC < 4000/cumm, and platelet count < 1, 50,000/cumm. Patients who had undergone blood transfusion and aged more than 65yrs were excluded from the study. A detailed history and clinical examination was carried out in each case and the relevant information was noted in a proforma. Bone marrow aspiration was performed using Salah's bone marrow aspiration needle from the iliac crest or sternum. A full blood count was done, peripheral smear and reticulocyte count was also performed in each case. Bone marrow smears were stained with Leishman, Giemsa and iron stain wherever necessary.*
***Results:*** *All patients presented with pallor. Other complaints are fever, generalized weakness, cough, and diarrhea in descending order. The youngest patient being 16yrs old and the oldest patient 58yr old. M: F ratio being 7:4 showing the higher prevalence of the disease in male than in female. Majority of the patients fall in the middle class of socioeconomic group. The most common cause of pancytopenia as revealed by bone marrow was Megaloblastic anemia (73%) and Aplastic anemia (27%).*
***Conclusion:*** *Megaloblastic anemia and Aplastic anemia are the common causes of pancytopenia.*
*M: F ratio being 7:4. Majority of the patients fall under the age group of 26-35yrs (54%) and in the middle class of socioeconomic group.*
***Keywords:*** *Pancytopenia, Megaloblastic anemia, Aplastic anemia, Bone marrow, Hemogram.*

## I. Introduction

This project gives an insight to understand and establish the etiology of pancytopenia and its prevalence in Bellary. Even though the analysis were carried out for only a month, the condition makes a strong statement for further studies on this topic.

Pancytopenia is not a disease entity but a triad of findings that may result from a number of disease processes. These disorders may affect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia.[1] The presenting symptoms are usually attributable to anemia or thrombocytopenia; Leucopenia is an uncommon cause in the initial presentation but can become the most serious threat to life during the course of the disorder. The incidence of various disorders causing pancytopenia varies due to geographical distribution and genetic disturbances.[2,4] The management and prognosis of pancytopenic patient depends on the underlying pathology.[6]

This is a prospective study, to establish the underlying pathology and evaluation of patients with pancytopenia.

## II. Materials and Methods

This prospective study was carried out for One month from 1st Aug 05-31[st]Aug 05 in Department of Pathology, Vijayanagar Institute of Medical Sciences, Bellary. All patients who presented with pallor, fever, generalized weakness, and diarrhoea were subjected to complete hemogram and were included in the study based upon the laboratory results.

**Criteria for inclusion:**
Hb < 5g/dl,
TLC < 4000/cumm and
Platelet count < 1, 50, 000/cumm.

**Criteria for exclusion:**

Patients who had undergone blood transfusion and aged more than 65yrs were excluded from the study. A detailed history and clinical examination was carried out in each case and the relevant information was noted in a proforma.

Bone marrow aspiration was performed using Salah's bone marrow aspiration needle from iliac crest or sternum. A full blood count was done, peripheral smear and reticulocyte count was also performed in each case. Bone marrow smears were stained with Leishman, Giemsa and iron stain wherever necessary.

## III. Results

A total of 363 blood samples were subjected to complete hemogram out of which 345 cases were diagnosed to be anemic, in the order, 211(61%) cases as mild anemia, 82(23%) cases as moderate anemia and 52(16%) cases as severe degree anemia. Out of these 345 cases, 11 cases (3%) are pancytopenia

The prevalence of anemia was more in case of males (206cases) than females (157 cases) ratio being 1.3:1 respectively.

The age distribution being: 2cases in between 15-25 yrs, 6 cases in between 26-35yrs, none in 36-45yrs of age, 2 cases in between 46-55yrs and 1case in between 56-65 yrs. (Table-1)
The youngest patient being 16yrs old and the oldest patient being a 58yr old.
M: F ratio being 7:4 showing higher prevalence of the disease in males than in females.Table-2).
Majority of the patients fall in the middle class of socioeconomic group.

The most common complaints were fever (63%) generalized weakness (45%) followed by cough (27%) and diarrhoea (27%).

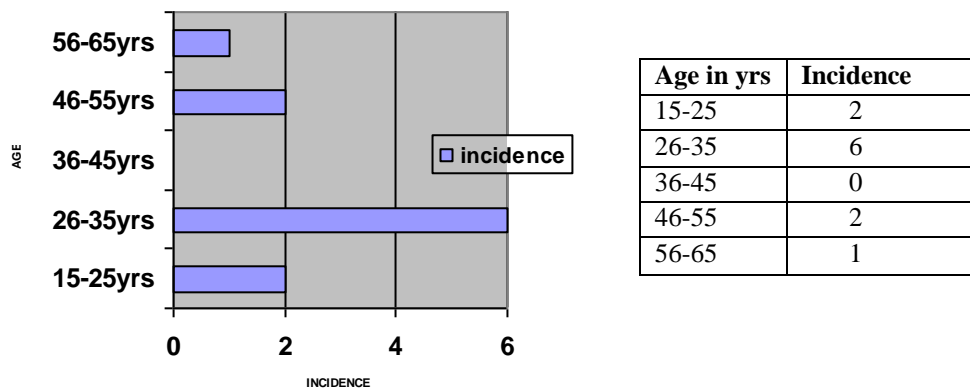It was found that pallor (100%) was the most common clinical feature followed by splenomegaly.
Causes of pancytopenia as revealed by the bone marrow analysis are:
Megaloblastic anemia 8 cases out of the 11 (72%) and
Aplastic anemia 3 cases out of the 11 (28%).

**Observations:**
Table-1 Incidence of pancytopenia



| Age in yrs | Incidence |
|------------|-----------|
| 15-25 | 2 |
| 26-35 | 6 |
| 36-45 | 0 |
| 46-55 | 2 |
| 56-65 | 1 |

**Inference:**

The age distribution being: 2cases in between 15-25 yrs, 6 cases in between 26-35yrs, none in 36-45yrs of age, 2 cases in between 46-55yrs and 1case in between 56-65 yrs.
The youngest patient being 16yrs old and the oldest patient being a 58yr old.
Table -2 Showing sex ratio.

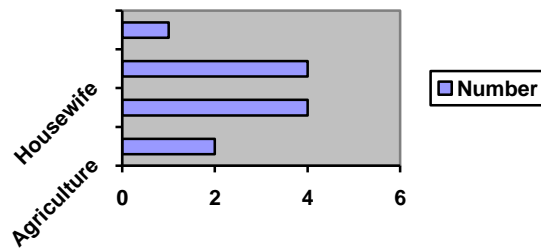| Sex | No. of Patients |
|------|-----------------|
| Male | 206/363 (56.74%) |
| Female | 157/363 (43.26%) |
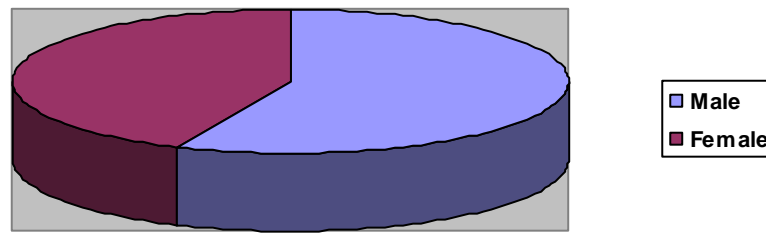
**Inference:**

M: F ratio is 7:4 showing higher prevalence of the disease in males than in females.

Table-3: Showing the occupation.

| Occupation | Number |
|------------|--------|
| Agriculture | 2 |
| Coolie | 4 |
| Housewife | 4 |
| Student | 1 |



**Inference:**

      Majority of the patients who were affected by pancytopenia are Coolie and Housewife.

Table-4: showing socioeconomic status.

| Income(in Rs) | Number |
|---------------|--------|
| < 500 | 0 |
| 500-1000 | 0 |
| >1000 | 10 |

**Inference:**

Majority of patients are from middle class (B.G.Prasad classification).

## IV.    Discussion

      Pancytopenia refers to the reduction in all three formed elements of blood-erythrocytes, leukocytes, and platelets.[2]

      Pancytopenia is usually caused by bone marrow replacement or failure but is sometimes consequent on splenic pooling/peripheral destruction of mature cells. It is most often consequent on cytotoxic or Immunosuppressive therapy, Savage David.G et.al,[7] reported megaloblastic anemia as a major cause followed by aplastic anemia and acute leukemia. Our study also revealed Megaloblastic anemia as a major cause followed by aplastic anemia. There are many causes of pancytopenia. The frequencies of causes of pancytopenia have been reported in limited number of studies. The commonest cause of pancytopenia was aplastic anemia reported by Mussarrat et.al,[6] which accounted for 38.27%, whereas in our study it is second common cause accounting for 28%.

      The high prevalence of nutritional anemia in India has been cited for the increased frequency of megaloblastic anemia.[5] In our study the incidence is noticed in adult age group between 26-35yrs (6cases) & in middle class family of socioeconomic group. Also our analysis shows the prevalence of pancytopenia in Labour class and in housewives, attributing to the nutritional status of that group. The early diagnosis of the causation of pancytopenia is important because most of these causes are treatable[3].

## V.    Conclusion:

      Megaloblastic anemia and aplastic anemia are the most common causes of pancytopenia in our study. Hence the physical and hematological examinations play an important role in evaluation of pancytopenia. The other causes should also be kept in mind like Leukemia's, Malaria, Immunodeficiency syndromes & Myelodyplasia.

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