



## A RETROSPECTIVE STUDY OF PANCYTOPENIA

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**ABSTRACT** **INTRODUCTION:** Pancytopenia refers to the combination of anaemia, leukopenia and thrombocytopenia. Causes maybe due to bone marrow failure, bone marrow infiltration, ineffective haematopoiesis or peripheral pooling. The severity and underlying pathology determines the management and prognosis.

**METHODS:** This is a retrospective study conducted by the department of Pathology at Saveetha Medical College and Hospital based on gender, age and etiological causes of Pancytopenia.

**RESULTS:** On study comprised of 60 patients females were more predominantly affected when compared to males at the ratio of 1.38:1. The most commonly affected age group was between 40 – 70 years. The most common etiological cause was found to be Anaemia. Other causes included Neoplasm Infections and Chronic diseases

**CONCLUSIONS:** The etiological causes of Pancytopenia vary depending on age, gender, country, and other conditions. Most of the etiological causes could be diagnosed with laboratory analysis and radiological imaging. Megaloblastic Anaemia is the most common cause for Pancytopenia.

**KEYWORDS :** Pancytopenia, Bone Marrow, Megaloblastic Anaemia

**INTRODUCTION**

A multitude of disorders primarily or secondarily affecting bone marrow manifests with various haematological derangements, which is reflected in the peripheral blood, commonly as Pancytopenia.

Pancytopenia is an important clinico-hematological entity encountered in our day-to-day clinical practice. There are varying trends in its clinical pattern, treatment modalities, and outcome.<sup>[1]</sup> It is a disorder in which all three major formed elements of blood (red blood cells, white blood cells and platelets) are decreased in number presenting as Anaemia, Leukaemia and Thrombocytopenia.

The causes of pancytopenia can be due to decrease in hematopoietic cell production in the marrow resulting from infections, toxins, malignant cell infiltration, chemotherapies and radiation.<sup>[2]</sup>

The severity of pancytopenia and the underlying pathology determine the management and prognosis of the patients.<sup>[3]</sup>

Marrow cellularity and composition in cases of pancytopenia differ in relationship to underlying pathological condition. The marrow is generally hypo cellular in cases of pancytopenia caused by a primary production defect. Cytopenia resulting from ineffective haematopoiesis, increased peripheral utilization or destruction of cells, and bone marrow invasive processes are usually associated with a normocellular or hyper cellular marrow.<sup>[4]</sup>

The spectrum of disorders primarily or secondarily affecting the bone marrow may manifest with peripheral pancytopenia.<sup>[5]</sup> It is recommended that bone marrow aspiration and biopsy be done simultaneously in cases of pancytopenia. Aspiration smears are superior for morphological details while biopsy provides a more reliable index of cellularity and often reveals bone marrow infiltration, fibrosis and granulomas.

The purpose of this study is to evaluate Pancytopenia clinically and investigate accordingly.

**MATERIALS AND METHOD**

This retrospective study was conducted at our institute, Saveetha Medical College and Hospital, Tamil Nadu, India over a period of 6 months from July 2018 to December 2018. 60 patients of both genders presenting to department of Medicine with hemogram suggestive of Pancytopenia were included in the study.

Pancytopenia was defined as haemoglobin <9gm/dl, WBC <4,000/mm<sup>3</sup>, and platelets <100,000/mm<sup>3</sup>.

Complete physical examination was done with emphasis on lymphadenopathy, hepato-splenomegaly, gum hypertrophy and sternal tenderness. Routine blood tests were performed. Bone marrow examination was done on patients who did not respond to initial therapy guided by routine blood test.

**INCLUSION CRITERIA**

- Indoor patients with Pancytopenia
- Age more than 10 years

**EXCLUSION CRITERIA**

- Patients on chemotherapy

**RESULTS**

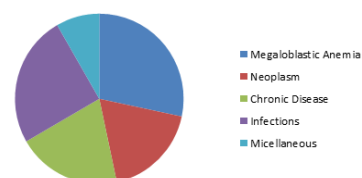
A total of 60 patients who presented with pancytopenia were studied. They consisted of 34 males and 26 females. The age of patients ranged from 10 to 80 years (mean age, 45 years). Out of 60 cases. No familial disease was observed in association with pancytopenia.

Gender and diagnosis wise distribution of Pancytopenia is shown in Table 1. Table 1 shows that out of 60 cases most common gender presented with Pancytopenia was female and most common diagnosis was Anaemia.

**Table 1: Gender wise distribution of Pancytopenia as per etiology**

Diagnosis	Female	Male
Anaemia	7	10
Neoplasm	6	5
Chronic Disease	5	7
Infections	6	9
Miscellaneous	2	3

Piechart 1 shows the common etiology of Pancytopenia. Piechart 1 shows that out of the 60 cases recorded that the most common cause of Pancytopenia is Anaemia followed by Neoplasm, Infections, Chronic diseases and other miscellaneous causes.



**Piechart 1 : Common etiology of Pancytopenia**

**DISCUSSION**

60 cases of Pancytopenia were studied regarding age, gender and

etiology wise distribution and the results were compared with numerous studies.

In current study; the age of the patients was ranging from 10 to 80 years.

The most commonly affected age group was between 40 to 70 years and the most commonly affected gender was female. The most common etiology found in the present study was Anaemia followed by Neoplasm and Infections.

In current study, we came across 3 paediatric pancytopenia cases all belonging to female gender, again megaloblastic Anaemia was the common cause. Comparable results were reported by Bhatnagar et al.<sup>[6]</sup>

The commonest cause of Pancytopenia, reported in numerous studies throughout the world has megaloblastic Anaemia.<sup>[7]</sup> Table 2 shows the comparison of various studies on megaloblastic anemia.

**Table 2: Comparison of various studies on megaloblastic anemia as etiology**

STUDIES	MEGALOBLASTIC ANEMIA AS ETIOLOGY
Akshata, et al.	20%
Thakkar, et al.[11]	37%
Khunger, et al.[12]	53%
Deepak Kumar, et al.[13]	68%
Lakhey, et al.[14]	18.75%
Our study	38%

Incidence of megaloblastic Anaemia was 38% in current study. All the studies regarding Pancytopenia in India stress the importance of megaloblastic Anaemia being the major cause of Pancytopenia. It is a rapidly correctable disorder and should be promptly notified.<sup>[8]</sup>

Sepsis was very well associated with Pancytopenia. Table 2 shows comparison within few studies on sepsis and pancytopenia

**Table 2: Comparison of various studies on sepsis**

STUDIES	SEPSIS ASSOCIATION IN%
Akshatha, et al [10]	2%
Sankepally, et al [11]	3%
Our study	1.44%

Bone marrow aspiration was diagnostic value to the patients of Pancytopenia<sup>[9]</sup>. Most common cause of hypercellular bone marrow was megaloblastic anaemia.

The causes of pancytopenia were treatable in 90% of patients, who fully recovered from cytopenia. Death occurred in 10% of the cases, which was due to severe Pancytopenia and overwhelming infections and complications.

## CONCLUSION

Pancytopenia is a common haematological problem encountered in clinical practice and should be suspected on clinical grounds when a patient presents with unexplained anaemia, neoplasm or prolonged fever. Bone marrow aspiration is an important diagnostic tool in hematology which helps to evaluate various causes of Pancytopenia.

The present study concludes the predominant gender and age groups affected along with the common etiology of Pancytopenia. Severe pancytopenia has significant relation with clinical outcome and can be used as a prognostic indicator.

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