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# A clinicohematological study on pancytopenia in adult patients in a tertiary care center

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**Abstract :**

**Objective :**To study etiology and clinical profile of pancytopenia patients

**Design :Crosscectional study**

**Setting :**A large, academic, tertiary medical center

**Methodology**: Clinicohematological parameters including laboratory data of all patients with a primary diagnosis of pancytopenia was taken . The various etiological factors, clinical presentations and lab investigations were taken into account and compared and prognosis was assessed for each patient

**Results:** A male preponderance was observed, and the majority of patients were aged above 60 years. The most common clinical features were pallor and splenomegaly.

Common PS finding was NCNC anaemia.67 percent of patients had hemoglobin less than 7 g%; whereas around 50% of the sample had WBC < 2000 and platelets less than 50000, 52 % had vitamin B12 deficiency, 32% had folic acid deficiency and 19% had a deficiency of both. The most common cause of pancytopenia was Vitamin B12 deficiency.Most common malignancy associated with pancytopenia was AML.

**Interpretation and conclusion:** Several easily recognisable and treatable conditions can manifest as pancytopenia. Prompt management of such conditions, notably sepsis and megaloblastic anaemia, can result in the resolution of the cytopenias and negate the need for a BME. Pancytopenia investigations, when guided by appropriate clinic-laboratory findings, can promptly identify the underlying aetiology, while also identifying cases where an expedited BME is required.

**Key words**: Aplastic anemia, Bone marrow biopsy, Megaloblastic anemia, Pancytopenia

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## Introduction

Pancytopenia is a condition which involves the presence of anemia, leucopenia and thrombocytopenia. That is, there is a presence of low haemoglobin levels, less than 13.5 g/dl in males and less than 11.5 g/dl in females, less than 4 x 103/l leucocyte count and less than 150 x 103/l platelet count.

In the initial stages, pancytopenia may go undetected as it involves only a mild marrow function impairment, but during stress or increased demand it becomes more apparent. Pancytopenia usually results from decreased hematopoetic cell production, suppression of marrow growth or replacement of marrow by abnormal cells, suppression of marrow differentiation, defective cell formation, trapping of cells in a hypertrophied and overactive reticuloendothelial system, antibody mediated

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sequestration and destruction of Symptoms of pancytopenia include fatigue, bleeding, dyspnea, and increased tendency to infections.

Fatigue and fever are usually the chief complaints. The incidence of pancytopenia among the population varies with the geographical distribution as well as their genetic The cause of pancytopenia is determined by detailed primary haematological investigations along with bone marrow aspiration and biopsy.

**Materials And Methods:**

**Source of data:**

All patients diagnosed with pancytopenia who are hospitalised at Sapthagiri Institute of Medical Sciences and Research Centre will be included.

A. Study design: Cross sectional study

B. B. Study period: 14 months April 2022 to August 2023

C. Place of study: Research Facility of the Sapthagiri Institute of Medical Sciences.

D. Sample Size : 25

**E. Inclusion criteria :**

- Patients with pancytopenia
- People who are willing to provide informed consent

**F. Exclusion Criteria:**

- Prior history of chemotherapy, radiotherapy
- Patients who do not give informed consent

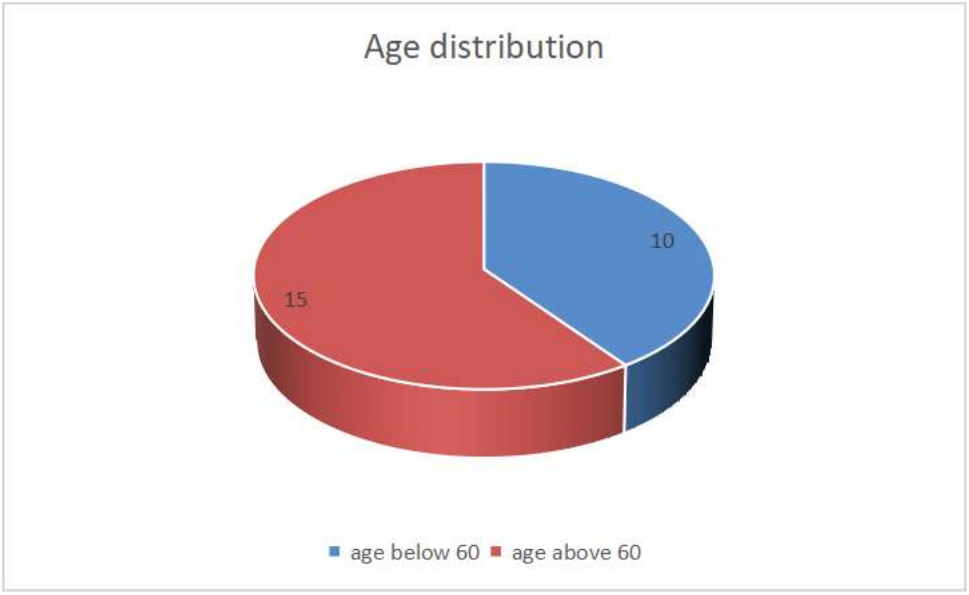
**G. Methodology**: Clinical and laboratory data of all patients with a primary diagnosis of pancytopenia was taken . The various etiological factors, clinical presentations and lab investigations were taken into account and compared and prognosis was assessed for each patient.

**STATISTICAL ANALYSIS:**

Using SPSS V.20 for analysis, the obtained data will be entered into Microsoft Excel. The result will be expressed in the form of descriptive and inherently statistics.

If $p < 0.05$, it is said to be statistically significant

**Results:**




Pie chart showing age distribution of patients with pancytopenia

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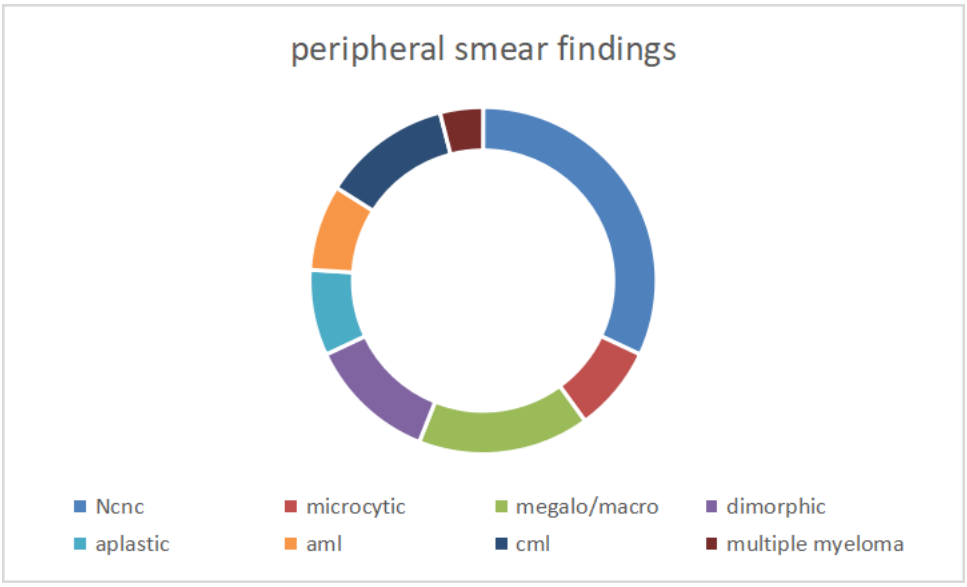
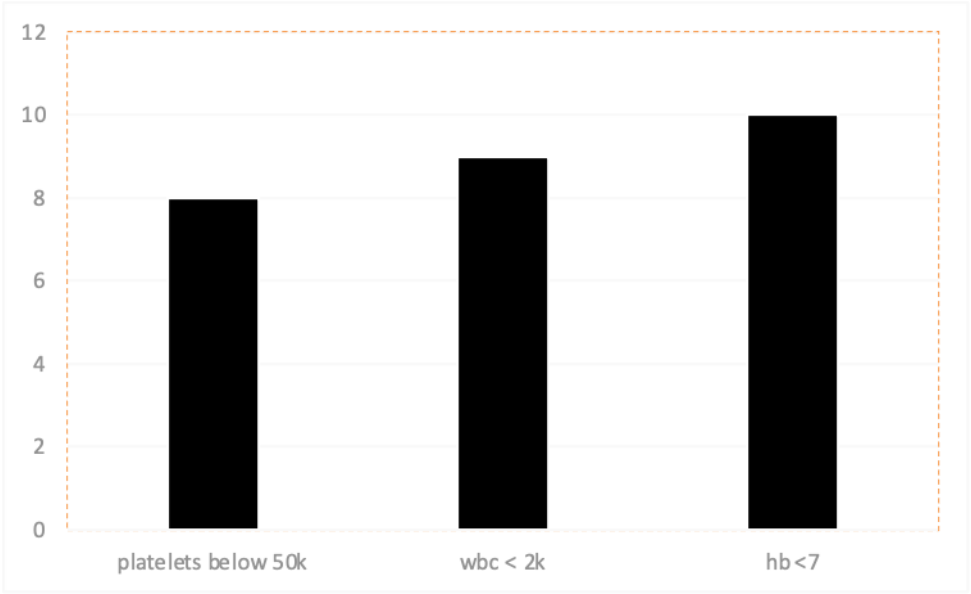
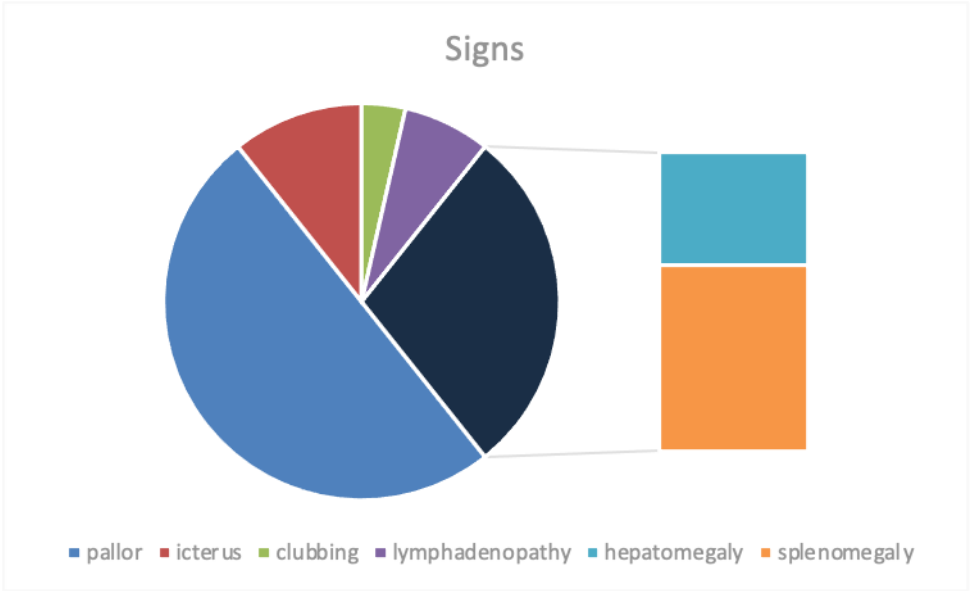
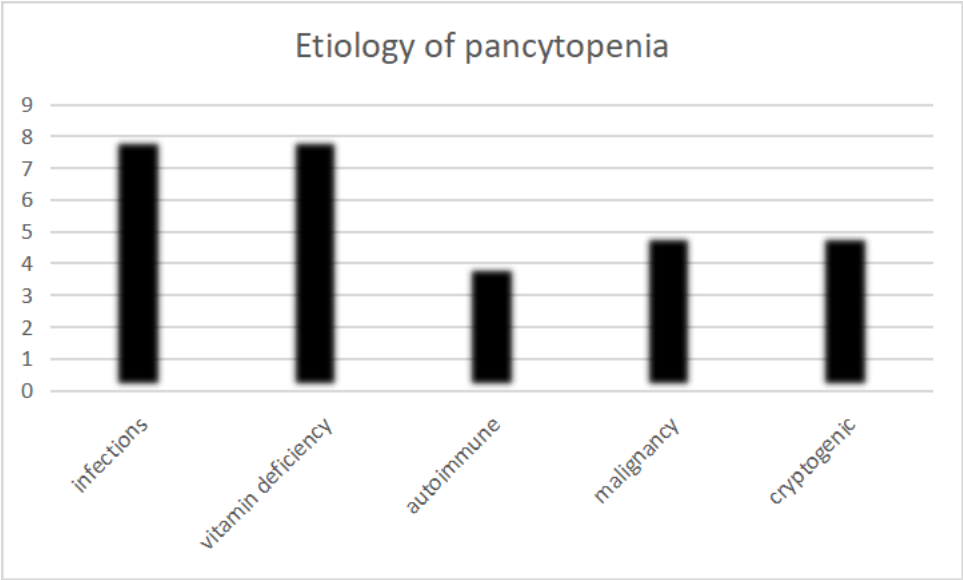



pie chart showing PS findings



ISSN: 0975-3583,0976-2833 VOL15, ISSUE 01, 2024




**Bar graph showing etiology of pancytopenia**

**Discussion:**

Pancytopenia is not a disease by itself but is a manifestation of various conditions resulting in decreased cellular components, thereby causing anemia, leucopenia and thrombocytopenia. The evaluation of pancytopenia starts from history, physical examination and basic haematological, biochemical, radiological, bone marrow aspiration and biopsy. Although it is invasive, it is a very simple procedure with only slight discomfort to the patients and is done fairly regularly.

Bone marrow aspiration is usually done for the estimation of unexplained cytopenia and malignant conditions such as leukemia, staging of a neoplasm as well as storage disorders. Trephine biopsy is usually done when there is a suspicion of hypoplasia, aplasia or dry aspiration, granulomatous conditions.

Aplastic anemia causes failure of haematopoesis. The cause is proposed to be immune mediated resulting in destruction of the blood forming cells by lymphocytes. Chemicals or drugs in the environment are said to be the cause of the errant immune system.

VitB12 deficiency was the most common cause in this study and can present with knuckle pigmentation, loss of posterior column sensations and pancytopenia and may even show a hemolytic anemia picture.

**Conclusion :** Several easily recognisable and treatable conditions can manifest as pancytopenia. Prompt management of such conditions, notably sepsis and megaloblastic anaemia, can result in the resolution of the cytopenias and negate the need for a BME. However, haematological malignancy and unexplained pancytopenia strongly rely on a BME to establish a diagnosis. Pancytopenia investigations, when guided by appropriate clinic-laboratory findings, can promptly identify the underlying aetiology, while also identifying cases where an expedited BME is required. This is valuable in resource-conscious medicine.

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