**ORIGINAL ARTICLE**

# Frequency of causes of Pancytopenia in patients admitted at Isra University Hospital Hyderabad

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## ABSTRACT

**Aim**: The aim of this study is to analyze the frequency of underlying pathology and presenting features of pancytopenia at Hyderabad, Sindh.

**Methodology:** Sixty patients with pancytopenia were included in this study from June, 2006 to May, 2007. Patients on chemotherapy and radiotherapy were excluded from the study. Blood count, Bone marrow aspiration and trephine biopsies were performed according to standard methods.

**Results:** Common causes of pancytopenia in this study were Aplastic anaemia 20 (33.3%), megaloblastic anaemia 16 (26.66%), hypersplensim 16 (25%), acute leukemia 6 (10%), drug induced 3 (5%), and metastatic tumors 3 (5%).

**Conclusion:** Aplastic anaemia, megaloblastic anaemia and hypersplemsin were common causes of pancytopenia in this study. Although trephine biopsy is also useful to diagnose the neoplasms

**Key wards:** Pancytopenia, Aplastic anaemia, hypersplenism.

## INTRODUCTION

Pancytopenia is not a disease entity but a triad of findings that may result from a number of disease processes. These disorders may effect bone marrow either primarily or secondarily, resulting in the manifestation of pancytopenia[1] .The presenting symptoms are usually attributable to anemia and thrombocytopenia. Leukopenia is an uncommon cause of the initial presentation but can become the most serious threat to life during the course of the disorder. Pancytopenia can be due to decrease in haemopoietic cell production in the bone marrow e.g. by infections, toxins, and malignant cell infiltration or can have normocellular or even hypercellular marrow, without any abnormal cells, e.g. ineffective hematopoiesis and dysplasia, maturation arrest of all cell lines and peripheral sequestration of blood cell[2].

Few clear recommendations can be found as to the optimal investigative approach to pancytopenia. Some experts suggest that marrow examination is essential to the diagnosis, but it has not been established whether the procedure is necessary in all pancytopenic patients. Aplastic anaemia, megaloblastic anaemia, and infections such as malaria, kala-azar and bacterial infections can be common causes of pancytopenia in the developing countries. Nutritional megaloblastic anaemia is also one of the leading causes of pancytopenia[3,4]. Clinically, patients presenting with pancytopenia should be evaluated for possibility of either a bone marrow failure syndrome or acute malignancy, particularly when associated with lymphadenopathy or visceromegaly. Bone marrow aspiration & trephine biopsies are one of the most frequent and relatively safe, invasive procedures done routinely to evaluate the cause [5, 6]. Through an invasive procedure, it can be easily performed even in the presence of severe thrombocytopenia with little or no risk of bleeding. Commonly, it is done for the evaluation of unexplained cytopenias and malignant conditions like leukemia. Bone marrow examination is also at times done for the diagnosis or staging of a neoplasm and storage disorders. Trephine biopsy is usually performed when there is hypoplasia or aplasia on aspiration. There are wide variety of disorders in children where bone marrow examination provides diagnostically important information [7, 8].

## MATERIAL AND METHODS

Pancytopenia was diagnosed in the presence of anaemia (Hb < 10.g/dl), leucopenia (WBC $\leq$ 3.5 x $10^9$/ L) and thrombocytopenia (platelets < 150 x $10^9$/ L).

This study was carried in pathology department of Isra University Hospital from June, 2005 to April, 2008. A total of 60 adult patients were included in the study. A detailed relevant history including the

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treatment history, drug intake, radiation exposure, along with sphysical examination like pallor, jaundice, hepatomegaly, splenomegaly and lymphadenopathy, was taken. Patients on cancer chemotheraphy were excluded from the study.

Blood counts obtained prior to transfusion were done on an automated blood analyzer Differential leucocyte count and red cell morphology was done manually by staining the blood smears by Giemsa stains. Bone marrow aspiration and trephine biopsy were performed. H & E stain was applied to trephine biopsies.

Findings of aspiration and trephine biopsies were interpreted in the light of history, clinical examination and peripheral blood findings. Standard morphologic criteria were used in diagnosis.

## RESULTS

Sixty patients with pancytopenia were included in this study over the period of two years. Blood count bone marrow aspiration and trephine biopsies were performed according to standard method. Out of 60 cases, 40 (66.66 %) were male and 20 (33.3%) were female. Male to female ratio is 2:1. Patients age ranged from 06 years to 75 years. Commonest clinical features were shown table No 1. Causes of pancytopenia found in this study were shown in Table-2 Bone marrow aplasia represents the largest group i.e. 20 (33.33%), megaloblastic 16 (26.66%), hypersplenism 12 (25%), acute leukemia 3 (10%), drug induced 3 (5%) and metastatic tumors 3 (5%) were found in this study.

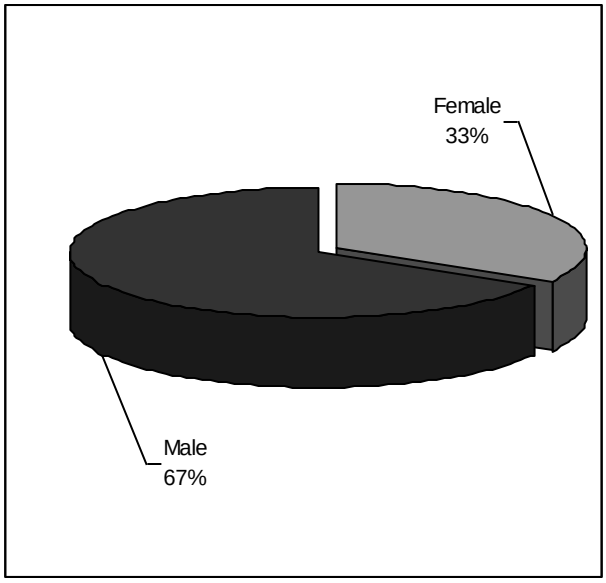
Table I: Disorders Causing Pancytopenia

| Disease | No. of Cases | %age |
|---|---|---|
| Aplastic anemia | 20 | 33.33 |
| Megaloblastic Anemia | 16 | 26.66 |
| Hypersplenism | 12 | 20 |
| Acute Leukemia | 6 | 10 |
| Drug induced | 3 | 5 |
| Metastatic Tumor | 3 | 5 |

Table II Clinical features of patients presented with pancytopenia.

| Clinical feature | No. of cases | %age |
|---|---|---|
| Pallor | 50 | 83.33 |
| Fever | 45 | 75 |
| Jaundice | 16 | 28 |
| Dyspnea | 25 | 41 |
| Splenomegaly | 6 | 10 |
| Hepatomegaly | 6 | 10 |
| Septicaemia | 10 | 16.6 |

Gender Distribution




## DISCUSSION

Pancytopenia is usually caused by bone marrow replacement or failure but is sometimes consequent on splenic pooling or peripheral destruction of mature cells. In hospital practice, pancytopenia is often consequent on cytotoxic or in immunosuppressive drug therapy [9, 10]. There are many causes of pancytoepnia. The frequency of causes of pancytoepenia has been reported in a limited number of studies. The commonest cause of pancytopenia in present study was aplastic anemia (33.33%) whereas in other studies it varied from 7.7% to 52.7%. The second most common cause of pancytopenia in this study is megaloblastic anemia (26.66%) while in other studies, it varied from 0.8% to 68% [11,12]. In another study conducted in Malaysia, pancytopnia was a common finding in 64% patients with megaloblastic anemia. The high prevalence of nutritional anemias in Indian has been cited for the increased frequency of megaloblastic anemia[13,14]. Because of geographical and social similarities, nutritional anemias may also be responsible for increase frequency of megaloblastic anemia in interior Sindh. Among the nutritional anemia, folate is more prevalent than vitamin B12 in Sindh. The incidence of aplastic anemia in west is 10-25% which is lower than observed in this study (38%). Aplastic anemia is thought to be more common in Orient than in West. The increased incidence may be related to environmental factors such as increased exposure to toxic chemicals rather than genetic factors. As Pakistan is also an agricultural country, pesticide may be an important factor in the high incidence of aplastic anemia[15,16,17]. Savage et al(1999)[12] observed

that the most common cause of pancytopenia was megaloblastic anemia followed by aplstic anemia, acute leukemia, AIDS and hyperplenism. In other studies, the causes of pancytopenia are aplastic anemia (29.5%), megaloblastic anemia (22%), aleukemic leukemia or lymphoma (18%) and hypersplenism (11.4%)[18,19,20]. In these studies, acute leukemia was the third most common cause of Pancytopenia followed by hypersplenism but in this study hypersplenism was the third commonest cause followed by acute Leukemia.

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