

Study of 100 Cases of Pancytopenia in Swat

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ABSTRACT

Objective: To diagnose different conditions producing pancytopenia on the basis of clinical, hematological and bone marrow studies.

Study Design: Prospective Study

Place and Duration of Study: This study was conducted at the Department of Medicine, Saidu Teaching Hospital, Saidu Sharif, Swat from March 2011 to March 2012.

Materials and Methods: 100 patients with pancytopenia were analyzed. Peripheral smears of the patients were analyzed for RBC, WBC and platelets morphology along with presence and absence of immature cells and abnormal cells. On bone marrow examination, morphology of all cells lineage, cellularity, parasite and abnormal cells were scrutinized. Trepine biopsy was done where ever indicated

Results: Patients age ranging from 12 to 80 years. Most of the patients (70%) were in the 12-30 years of age group. Pallor was the predominant clinical feature (97%) while weakness was the main presenting feature (71%). Aplastic anemia (42%) followed by Megaloblastic anemia (28 %) was found to be the most common cause of pancytopenia as unveiled by bone marrow examination

Conclusion: In Swat, the prevalent causes of pancytopenia are Aplastic anemia, Acute leukemia, Megaloblastic anemia and Hypersplenism.

Key Words: pancytopenia, acute leukemia, megaloblastic anemia, aplastic anemia, hypersplenism.

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INTRODUCTION

Pancytopenia is the characterized by reduced number of all blood cell lines such as decrease number of red blood cells, white blood cells and platelets^{1,2}. The basic underlying mechanism is decrease production by hematopoietic cells in bone marrow which may be caused by various infections, infiltration by malignant cells, different toxins, chemotherapeutic agents or radiation exposure². Many studies have been performed at different places which showed that frequency of pancytopenia is quite variable³⁻⁵. The key to appropriate management is the proper Identification of the underlying disease³.

Patients usually presents with sign and symptoms caused by anemia or thrombocytopenia, initial presentation due to leucopenia such as fever or with infection are uncommon but this can be most life threatening as the disease progresses.

In cases of pancytopenia due to different underlying pathology, the composition and cellularity of bone marrow differs.

Pancytopenia, when caused due to defect in production of primary cells, the bone marrow is found to be hypocellular. Other causes of cytopenias in which the process of hematopoiesis is ineffective or there is invasive processes of bone marrow and utilization and destruction of the cells is increased peripherally, the bone marrow is usually normocellular or hypocellular⁴. Geographic distribution as well as genetic disturbances highly affects the incidence of pancytopenia due to various disorders^{6,7}. It is the underlying pathology of pancytopenia which determines management and prognosis of the disease.

Aim of this study is to compare the incidence of underlying pathology and the salient clinical features of pancytopenia in Swat.

MATERIALS AND METHODS

this study was conducted at the department of Medicine in Saidu Teaching Hospital, Saidu Sharif, Swat from March 2011 to March 2012. A total of 100 patients of pancytopenia presented to Medicine Department STH were evaluated. Inclusion criteria in the study was Hb <10 g/dl, TLC <4000 cells/cmm, and platelet count <100,000 cells/cmm. Each case was evaluated with a detail history followed by clinical examination and the information was recorded in a pro forma. Examination of bone marrow was carried out in each case. 8 cases required trephine biopsy. A full blood count was done on hematology analyzer.

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Peripheral smear and reticulocyte count were also performed in each case.

RESULTS

100 cases of pancytopenia presented to the Medicine Department STH were evaluated. Out of these 100 cases 57 (57%) were male and 43 (43%) female. The gender distribution is shown in Fig 1.

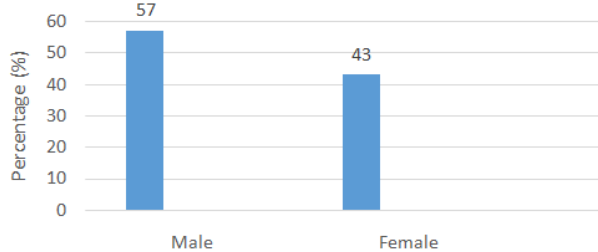


Figure No. 1: Gender Distribution Chart. Male to Female ratio: 1.33: 1

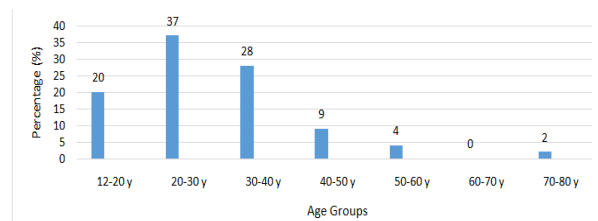


Figure No. 2: Age distribution chart

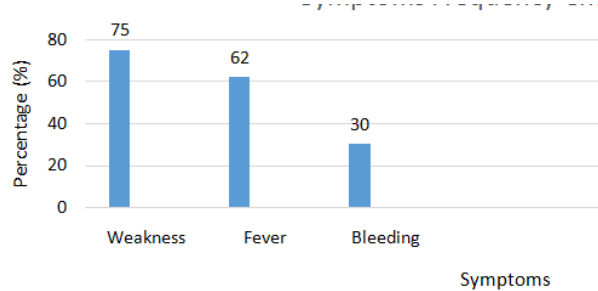


Figure No. 3: Symptoms frequency chart.

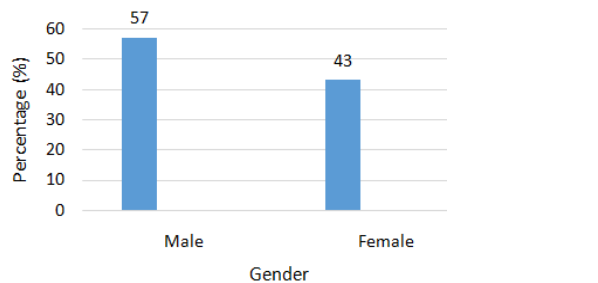


Figure No. 4: Signs frequency chart.

Fig 2 demonstrates the age distribution of patients with pancytopenia. In this study, the youngest patient was 13 years old while 77 years was the age of Eldest patient. In patients having pancytopenia, 20-30 years was the common age group.

The most common symptom reported was weakness followed by fever (62%) and bleeding (30%). Fig 3 shows the symptoms frequency.

The most common sign found was pallor along with splenomegaly. Fig 4 shows the frequency of clinical signs.

Table 1 shows different causes of pancytopenia as found in this study. Bone marrow aplasia was found in 42%, megaloblastic anemia in 28%, acute leukemia and hypersplenism represented 14% and 9% respectively.

Table No.1: Causes of pancytopenia

Cause	Number (n=100)	%age
Bone Marrow aplasia	42	42%
Megaloblastic anemia	28	28%
Acute leukemia	14	14%
Hypersplenism	9	9%
MDS	2	2%
Peripheral Destruction	2	2%
Malaria	1	1%
TB	1	1%
Abnormal mononuclear infiltrate	1	1%

DISCUSSION

Pancytopenia is a rare but serious hematological disorder dealt in everyday clinical practice predisposing to anemia, infections and bleeding manifestation such as hemorrhage, bruises and petechiae. Bone marrow aspiration along with trephine biopsy is performed to diagnose the underlying multiple and various causes. According to our study, as compared with the elder age group the risk of pancytopenia is more common at young age. Commonest age group was 20 - 30 years. From a total of 100 patients, there were 57 males while females were 43 in number. The ratio of male to female was 1.33:1. The results of our study shows great range of similarity to the study performed by Jalbani carried out in larkana⁽⁸⁾. In Jalbani's study, 72.5% were male patients while female patients were 27.5% with male to female ratio of 2.6:1. In contrast to this, another study performed by Aziz T⁽¹⁰⁾ in Karachi reported that pancytopenia is more common in females (59%) than males (41%). This difference in the incidence of pancytopenia may be associated with geographical variation. This geographical variation in the incidence of pancytopenia can be explained as that, males are the prime source of income in Northern areas, supporting their family by working outdoor specifically in chemical industries and fields; hence they are at a greater risk of exposure to different radiations and industrial toxins or pesticides and insecticides used in agriculture.

The most common presenting clinical features in our study was pallor along with generalized weakness

comprising of 96% and 75% respectively. Ishtiaq⁽⁹⁾, Aziz T⁽¹⁰⁾, and Niazi M⁽¹¹⁾ have reported the same results in their studies.

In the current study, aplastic anemia (42%) was the most common cause of pancytopenia in comparison to other review studies where it ranges from 7.7 % to 52.7%¹²⁻¹⁵. Megaloblastic anemia (28%) was the second common cause following aplastic anemia in our study, comparable to other studies where it ranges from 0.8 % to 68 %^{6,12,13,15}. In a study conducted in Malaysia, pancytopenia was a common finding in 64% of patients with megaloblastic anemia¹⁶. In India, the high frequency of megaloblastic anemia is contributed by nutritional deficiencies¹⁴. In Northern areas of Pakistan, nutritional anemia may be the main underlying cause leading to megaloblastic anemia due to a great deal of social and geographical resemblance. In Pakistan, folate deficiency is less prevalent than vitamin B12 among nutritional anemias¹⁷.

In west, the incidence of aplastic anemia is 10-25% which is lower than that observed in this study (42%). It is said that aplastic anemia is more common in Orient as compared to West. This higher incidence may be due to exposure to radiations, toxic chemicals and other environmental factors instead of genetics influences. Oriental ancestors currently residing in United State do not have this increase incidence of aplastic anemia^{18, 19}. In one of the etiology of aplastic anemia, over the counter medicines could be involved. Studies in Thailand have shown that a common cause for aplastic anemia is exposure to pesticides^{20,21}. The higher incidence of aplastic anemia in Pakistan may be due to the fact that Pakistan is an agricultural country and people have frequent exposure to pesticidal agents. According to the observations of Savage et al¹, Megaloblastic anemia was the most common cause of pancytopenia while aplastic anemia remained at second position followed by acute leukemia, acquired immune deficiency syndrome, and hypersplenism. Whereas Kumar²² stated that aplastic anemia (29.5%) is the commonest cause of pancytopenia followed by megaloblastic anemia (22 %), aleukemic leukemia, lymphoma (18 %), and hypersplenism (11.4 %). In both these studies, the third common cause of pancytopenia remained to be acute leukemia followed by hypersplenism as in our study.

CONCLUSION

It was concluded from this study that the commonest cause of pancytopenia was aplastic anemia, followed by megaloblastic anemia and acute leukemia. Young adult males are predominantly affected by aplastic anemia. Furthermore, in assessing the underlying cause of pancytopenia, aspiration biopsy along with trephine biopsy are important diagnostic tools.

Conflict of Interest: The study has no conflict of interest to declare by any author.

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