

Etiology and Clinical Pattern of Patients Presenting With Pancytopenia at Tertiary Care Hospital

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ABSTRACT

Objective: The objective of the study was to evaluate the various cause and clinical presentation in patients having pancytopenia in tertiary care hospital.

Study Design: Descriptive / cross-sectional

Place and Duration of Study: This study was conducted in the Medicine Department of LUMHS, Jamshoro from 2013-2015.

Materials and Methods: Total 80 cases of pancytopenia were enrolled in the study. Patients were included above age of 15 years from both sexes. Pancytopenia was defined as: WBCs ($\leq 4.0 \times 10^9/L$), hemoglobin (≤ 10.0 g/dl) as well as platelet counts ($\leq 150 \times 10^9/L$). All the clinical features and etiological pattern were noted in all cases and entered in the proforma. All the information was entered on SPSS version 18 and was analyzed.

Results: Total 80 cases were studied, who represented pancytopenia. Male were in majority 61(76.25%). Majority of the young cases was found with mean age of 33.23 years. Most common clinical feature was found general weakness in 19(23.75%) patients followed by fever (18.75%), dyspnea 11(13.75%), bone pain 6(7.5%), anemia 6(7.5%) and pain in legs in 4(5%) patients. According to the etiological pattern, aplastic anemia and malaria was found most common in 18 (22.5%) and 11 (13.75%) cases respectively.

Conclusion: Aplastic anemia and malaria was the commonest factor of pancytopenia in this study mostly in young males. The commonest clinical presentation observed was generalized weakness after that fever and dyspnea.

Key Words: Pancytopenia, Etiology, Clinical Pattern

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INTRODUCTION

Pancytopenia is a syndrome in which the altogether 3 main components of blood (platelets, red & white-blood cells) are below normal range.¹ It can possibly be a expression of a large range of syndromes, which mainly/secondarily influence the bone marrow. Pancytopenia generally takes place with indications of failure of bone marrow for example bruising, bleeding, dyspnea, pallor and raised inclination to infections. The in vitro diagnostics of pancytopenia is apparent by low range of WBCs ($\leq 4.0 \times 10^9/L$), hemoglobin (≤ 10.0 g/dl) as well as platelet counts ($\leq 150 \times 10^9/L$). The frequency of different syndromes leading to pancytopenia fluctuates as per genetic mutations as well as geographical distribution.

Pancytopenia can be caused by decline in formation of hematopoietic cell within the bone marrow due to infections, toxins, idiosyncratic reaction or excessive usage of drugs, tumoral cells suppression/infiltration¹, autosomal & congenital, radiotherapy / alcohol / chemotherapy / medication as well as parasitic infestation.²

The commonest factor of pancytopenia is suggested to be megaloblastic anemia, after that acute leukemia, aplastic anemia, hypersplenism, AIDS, hepatitis and TB. Aplasia is as well the commonest causative factor of acute pancytopenia². Cases having acute leukemia and aplastic anemia were generally children while adults were associated to megaloblastic anemia. Aplasia is the commonest causative factor severe pancytopenia. Macroovalocytosis, poikilocytosis, anisocytosis, teardrop erythrocytes, fragmentation, and microcytosis were further outstanding on the blood films of cases having megaloblastic anemia.³ It is an expression of several severe & deadly diseases with an broad differential diagnosis. It must be suspicious on clinical basis when a case represents with pallor, inclination to bleed and extended fever. Present study has been carried out to assess the commonest causes and clinical presentation of pancytopenia in tertiary center.

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MATERIALS AND METHODS

This was a descriptive cross-sectional study conducted within 2 years from 2013-2015 on pancytopenia presenting patients attending the medicine department and OPD of Liaquat University of Medical and Health science. Total 80 cases of pancytopenia were enrolled in the study. Cases from both sex were included and above 15 years of age. Patients who were less than of 15 years, pregnant females, received blood transfusions and associated with antiviral treatment and chemotherapy were not included in the study. Complete medical history and physical examination were carried out. Pancytopenia was detected as the existence of anemia (hemoglobin <11g/dl), leucopenia (WBCs $\leq 4.0 \times 10^9/L$), and thrombocytopenia (platelet count $\leq 4.0 \times 10^9/L$). Predesigned proforma was developed to record. Clinical pattern and etiology was assessed through detail history, general physical and systemic examination and routine laboratory investigations. All the demographic characteristics, clinical features and etiological pattern were noted in all cases and entered in the proforma. Data was entered and analyzed on SPSS version 16.

RESULTS

An overall number of 80 cases with pancytopenia were studied. 61(76.25%) patients were males while 19 (23.75%) patients were women. Men to women ratio were 2:1. Majority of young cases was noted and mean age was 33.23 years. Table:1

Table No.1: Age and gender of patients (n=80)

Age and Gender	No. of patients / (%)
Mean age	33.23 years
Male	61 (76.25%)
Female	19 (23.75%)

Table No.2: Clinical features of patients with pancytopenia (n=80)

Clinical features	No. of patients / (%)
Generalized weakness	19 (23.75 %)
Anemia	06 (7.5%)
Dyspnea	11(13.75%)
Jaundice	04(5%)
Fever	15(18.75%)
Bleeding	03(3.75%)
Abdominal pain	05(6.25%)
Bone pain	06(7.5%)
Mass in abdomen	05(6.25%)
Lymphadenopathy	02(2.5%)
Pain in legs	04(5%)

Regarding clinical features, generalized weakness was seen most commonly in 19(23.75%) patients followed by fever (18.75%), dyspnea 11(13.75%), bone pain 6(7.5%), anemia 6(7.5%) and pain in legs in 4(5%) patients. Table 2

In this study according to hematological pattern most of the patients 40(50%) had haemoglobin range between 1.5 – 5.0 g/dl. On the leucocyte count majority of the cases 50(62.5%) had total leucocyte count with range of 1,000– 2,500/cumm. According to thrombocytopenia mostly cases 40(50%) had platelet count between <5,000 – 50,000/cumm. Table 3

In this study, the disease processes resulting in pancytopenia in the peripheral blood in order of decreasing frequency were aplastic anemia 18 (22.5%) followed by malaria 11 (13.75%), megaloblastic anemia 09 (11.25%), tuberculosis 07 (8.75%) and hypersplenism 07(8.75%). Table 4

Table No.3: Hematological features of patients (n= 80)

Hematological features	No. of patients / (%)
HB (g/dl)	
1.5 - 5.0 g/dl	40 (50%)
5.1 - 8.0 g/dl	25(31.25%)
8.1 - 9.9 g/dl	15(18.75%)
TLC (cumm)	
490 – 1000	08(10%)
1000 – 2500	50(62.5%)
2500 – 3500	22(27.5%)
PLT (cumm)	
< 5000 - 50,000	40(50%)
51,000 - 80,000	18(22.5%)
81,000 - 99,000	22(27.5%)

Table No.4: Causes of pancytopenia (N=80)

Causes of pancytopenia	No. of patients / (%)
Megaloblastic anemia	09 (11.25%)
Malaria	11 (13.75%)
Nutritional deficiency anemia	03 (3.75%)
Aplastic anemia	18 (22.5%)
Tuberculosis	07 (8.75%)
Alcoholism	02 (2.5%)
Typhoid fever	05 (6.25%)
Drug induced	03 (3.75%)
Viral infection	03 (3.75%)
CLD	04 (5%)
Leukemia	06 (7.5%)
Spleen enlarge	07 (8.75%)
undiagnosed	02 (2.5%)

DISCUSSION

Pancytopenia is a crucial hematological challenge that makes the patient inclined to anemic expressions, infections, and a tendency to bleed. In this series commonest clinical feature was found general weakness in 19(23.75%) patients followed by fever (18.75%), dyspnea 11(13.75%). From etiological factors aplastic anemia and malaria was found most common in 18 (22.5%) and 11 (13.75%) cases respectively. We found 76.25% patients were males while 23.75% patients were females. In the studies of Aziz et al⁴, and Jain et al⁵ reported that higher frequency of male were

involved in pancytopenia as compare to female. This difference may be due to the male were more concerned with outdoor activities as well as they generally spent their more time outside doing labor in industries and fields, thus further exposed to farming pesticides & insecticides or radiations. In this study majority of young cases were noted and mean age was found 33.23 years. Similarly Khattak MB et al⁶ reported that out of 90 cases 54 men and 36 were women and mean age 28±15.84 years. In another study of Jha A et al⁷ also found comparable results of age.

Aplastic anemia was the commonest factor of pancytopenia in our study, which was observed in 22.5% cases. Similar results are seen in study conducted by Mussarrat et al⁸, in Nepal, in which 29.5% cases had pancytopenia due to aplastic anemia. It is the most widespread factor of pancytopenia accounted from a range of studies worldwide.⁹ The incidence of aplastic anemia varies from 10% to 52.7% as a cause of pancytopenia.⁹

Malaria is caused by microorganisms which live as parasites and transmitted to humans through the bite of a female Anopheles mosquito. When a contaminated Anopheles (female mosquito) bites to a healthy individual than Plasmodium parasites enter into his blood¹⁰. In the liver of the host Plasmodium parasites multiply number of times and start destroying the red blood cells before infection. In this study, 13.75% patients had pancytopenia due to malaria. The elevated prevalence of malaria was perceived in low-earnings group, deficient in hygiene (cleanliness) in the residence or region. In Malaria prophylaxis, taking anti-malarial drugs is good policy to avoid malaria.¹¹ Anwar A et al¹² demonstrated that significant ($P < 0.001$) changes in blood cells count of cases having fever he reported that cases had remarkable decreased in platelets and leucocytes than hemoglobin. Megaloblastic anemia, as factor of pancytopenia was seen in 11.25% patients in our study, while in other studies high prevalence of megaloblastic anemia was mentioned as well as by Khunger et al¹³ mentioned 72%, Tilak and Jain et al¹⁴ reported 68%, while 26.42% reported by Subrahmanyam and Padma et al.¹⁵ This wide difference may be due to nutritional anemia within that specific area of study. Tuberculosis was noted in 8.75% of our cases. Tareen et al¹⁶ in their study found that tuberculosis accounts for 17.22% cases of pancytopenia. Mert et al.¹⁷ pancytopenia had found 8% out of 38 cases with milliary T.B. while in other studies also reported comparable results.^{18,19}

In our study, generalized weakness was seen most commonly in 23.75% patients followed by fever 18.75%, dyspnea 13.75%, bone pain 7.5%, anemia 7.5% and pain in legs in 5% patients. These findings were similar to the findings of Memon et al.²⁰ Hayat AS et al²¹ reported that weakness was most common (97.64%) dyspnea (88.23%), fever (52.94%), and

abdominal abdominal pain (50.58%), while ascitis found only (5.88%) and jaundice only in (8.23%) cases. Aziz et al also found comparable results. In the present study, most of the patients i.e. 50% had haemoglobin percentage between 1.5 – 5.0 g/dl. 62.5% cases had total leucocyte count in range of 1,000–2,500/cumm and 50% cases had platelet count between < 5,000 – 50,000/cumm. Agarwal R et al²² also found comparable results regarding hematological pattern.

CONCLUSION

Aplastic anemia and malaria were frequent factors of the pancytopenia and mostly in young males were involved. The commonest clinical factors was general weakness after that fever and dyspnea.

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

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