Pancytopenia - A Study on Clinical and Etiological Profile at a Tertiary Care Institute

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Abstract

Introduction: Pancytopenia is a common hematological condition of varied etiology; however, only a few studies on pancytopenia from the northern regions of India have been published. Pancytopenia is the deficiency of all three cellular elements of blood, resulting in anemia, leucopenia, and thrombocytopenia. The frequency of underlying pathology causing pancytopenia varies considerably depending on various factors including age, geographic distribution, and genetic disturbances.

Purpose: The purpose of the study was to evaluate the clinical and etiological profile of patients presenting with pancytopenia to a tertiary care hospital of northern India.

Methods: A total of 66 patients were included in this study over a period of 18 months. Basic investigations were performed for each patient including hemoglobin, total leukocyte count, platelet count, and reticulocyte count. Absolute values including packed cell volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration were calculated for every patient.

Results: A total of 66 patients were studied over a period of 18 months including 40 males and 26 females. Male to female ratio was 1.53:1. The most common cause of pancytopenia was megaloblastic anemia (MA) found in 23 patients (34.84%), followed by aplastic anemia in 5 patients (7.57%), undiagnosed cases in 5 patients (7.57%), tuberculosis in 4 patients (6.06%), multiple myeloma and myelodysplastic syndromes in 3 (4.54%) patients each, respectively.

Conclusion: MA is still the most common cause of pancytopenia in our setting. All patients with pancytopenia should be sought for MA as it is a potentially treatable condition.

Key words: Aplastic anemia, Leukemia, Megaloblastic anemia, Multiple myeloma, Pancytopenia

INTRODUCTION

Pancytopenia by itself is not a disease but is the result of various diseases.[1] The presenting symptoms can be due to anemia, leucopenia or, thrombocytopenia leading to fatigue, and dyspnea. Thrombocytopenia can lead to bruising and mucosal bleeding. Leukopenic features are uncommon as the presenting symptom, but during the course of the disease becomes a life-threatening condition.[2] In pancytopenia, all the three formed elements of blood are reduced below the normal range.[3] By definition hemoglobin <13.5 g/dl in males or 11.5 g/dl in females, the leukocyte count <4 × 10⁹/L and platelet count <150 × 10⁹/L constitute pancytopenia.[4] Peripheral pancytopenia may be a manifestation of a wide variety of diseases which can primarily or secondarily affect the bone marrow. The presenting symptoms are usually attributable to anemia or thrombocytopenia. Red blood corpuscles survive much longer than platelets or neutrophils. Thus, anemia develops slowly (unless there is significant bleeding) and the typical symptoms of tiredness, fatigue, puffiness of face, edema, lassitude, and effort intolerance may not be striking in the initial phase.[5] The platelet count is first to be affected. Mucocutaneous bleeding is typical of thrombocytopenia with petechial hemorrhages in skin and mucous membranes (commonest being epistaxis, hematuria, gastrointestinal bleeding, menorrhagia, and only rarely intracranial bleeding). The presence of spontaneous bleeding with platelet count

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The most common causes of pancytopenia are usually fever (86.7%), fatigue (76%), dizziness (64%), weight loss (45.3%), anorexia (37.3%), night sweats (28%), pallor (100%), bleeding (38.7%), splenomegaly (48%), hepatomegaly (21.3%), and lymphadenopathy (14.7%).

Megaloblastic anemia (MA), hypersplenism (congestive splenomegaly, malaria, and leishmaniasis), aplastic anemia, myelodysplastic syndrome (MDS), subleukemic leukemia’s, tuberculosis, and multiple myeloma are some of the etiologies presenting with pancytopenia. Identifying the etiopathology of pancytopenia is important for a given case for timely treatment of the disease.

Bone marrow examination is extremely helpful in evaluation of pancytopenia. Bone marrow examination allows complete assessment of marrow architecture, pattern of distribution of any abnormal infiltrate and the detection of focal bone marrow lesions. The most common causes leading to pancytopenia on bone marrow examination are aplastic (AA) bone marrow (29.05%), MA (23.64%), hematological malignancies, i.e., acute myeloid leukemia (21.62%), and erythroid hyperplasia (19.6%). The most common symptom among the study patients was easy fatigability (77.21%) followed by fever (54.54%), palpitations (40.90%), anorexia (31.81%), and abdominal pain (27.27%). Hence, most of the patients presented with symptoms of anemia.

The aim of this study was to evaluate the clinical presentation and etiological profile of pancytopenic patients admitted at a tertiary care hospital of northern India.

MATERIALS AND METHODS

A total of 66 patients were identified over a period of 18 months (March 2016–September 2017) and were included in this study. In all patients, a detailed relevant history including the treatment history, history of drug intake, and any previous radiation exposure was obtained. Meticulous clinical examination of every patient was done for pallor, jaundice, hepatomegaly, splenomegaly, sternal tenderness, and lymphadenopathy. Basic investigations were performed for each patient including hemoglobin, total leukocyte count, platelet count, and reticulocyte count. Absolute values including packed cell volume, mean corpuscular hemoglobin, and mean corpuscular hemoglobin concentration were calculated for every patient. Chest radiography and abdominal ultrasonography were done in selected patients. Peripheral smear examination, and bone marrow examination was done in all patients, and wherever required, a trephine biopsy was also performed.

Inclusion Criteria

Patients with age >18 years, hemoglobin of <11.5 g per dL in women, and <13.5 g per dL in men, white blood cell count <4000 cells/cubic mm, and platelet count <1,50,000/cubic mm were included in this study.

Exclusion Criteria

Patients with a known hematological condition or patients on cancer chemotherapy and patients <18 years were excluded from the study.

Statistical Analysis

Data analysis was done with the use of IBM SPSS, version 21. Descriptive statistics were used to calculate the range, mean, and percentage.

RESULTS

This study was conducted on 66 patients admitted to the inpatient general medicine ward of a tertiary care institute presenting with pancytopenia and fulfilling the inclusion criteria. The most common symptom among the study patients was easy fatigability (77.21%) followed by fever (54.54%), palpitations (40.90%), anorexia (31.81%), and abdominal pain (27.27%). Hence, most of the patients presented with symptoms of anemia.

In Table 2, the most common cause of pancytopenia was MA (34.84%), followed by aplastic anemia (7.57%), followed by undiagnosed cases of pancytopenia (7.57%), and tuberculosis (6.06%) as depicted in Table 3.

DISCUSSION

There are varying reports on the underlying aetiology of pancytopenia from various parts of the world. The frequency of pattern of disease causing them varies in different population groups and this has been attributed to differences in methodology and stringency of diagnostic criteria, geographical area, genetic differences, nutritional status, prevalence of infection and varying exposure to myelotoxic drugs among others. Khunger et al. in a study of 200 cases reported MA in 72% and aplastic anemia in 14% of cases. Savage et al. in Zimbabwe studied 134 patients, identifying MA to be the most common cause of pancytopenia, followed by aplastic anemia and acute leukemia. Vitamin B12 deficiency was recorded as the most frequent cause of pancytopenia in the young adults. It is commonly diagnosed as MDS, because nuclear maturation abnormalities, dysplasia, and megaloblastic changes are observed in all the three series during the evaluation of bone marrow smears. MDS can be distinguished with elevated blood lactic dehydrogenase and recovery of pancytopenia in first 2 weeks after Vitamin B12 substitution.
A total of 66 pancytopenia patients were studied in our study. MA was the most common cause of pancytopenia in the present study, accounting for 34.84% of total patients followed by aplastic anemia in 7.57% of total patients, whereas tuberculosis, multiple myeloma, chronic liver disease, lymphoma, and infections (malaria and dengue) accounted for the rare causes. Dahake et al., in their study, found MA in 34% of cases. Similar results were found in studies by Khodke et al. and Manzoor et al., where the incidence of MA was found to be at 44% and 56%, respectively. In another study by Kim et al. that evaluated the etiology of pancytopenia with 77 patients’ bone marrow biopsies in India, MA was reported to be the most common cause (68%), whereas aplastic anemia (7.7%), MDS, and hemophagocytic syndrome, respectively, were rare causes. Jha et al. found 23.64% and Bhatnagar et al. found 28.4% cases of MA in their studies. In the study conducted by Bhatnagar et al., the most common symptoms were weakness (97.8%), and breathlessness (75%), and signs were pallor (98.3%) and splenomegaly (25.5%). Bone marrow aspiration revealed most common cause of pancytopenia was megaloblastic anemia (25%) followed by dimorphic anemia (17.2%) and infections (17.2%).

**CONCLUSION**

MA is still the most common cause of pancytopenia in our setting. All patients with pancytopenia should be sought for MA as it is a potentially treatable condition. The finding of hypersegmented neutrophils in the peripheral smear will guide the diagnosis. In Indian scenario, while evaluating etiology of pancytopenia, MA should always be kept in mind and it responds well to treatment. Pancytopenia should be evaluated aggressively as a significant number of patients have malignant condition in which early and aggressive treatment is warranted. Peripheral smear and bone marrow examination would help in identifying the etiology of pancytopenia in almost all patients. Bone marrow examination is necessary in the evaluation of patients with pancytopenia.
REFERENCES


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