

CLINICAL AND AETIOLOGICAL SPECTRUM OF PANCYTOPENIA IN A TERTIARY CARE HOSPITAL

Umbreen Arshad, Rabbia Khalid Latif, Saqib Qayyum Ahmad, Mehr Muhammad Imran*, Fauzia Khan, Shahid Jamal

Army Medical College/National University of Medical Sciences (NUMS) Rawalpindi, Pakistan, *Medical Unit-5, District Headquarters Hospital Faisalabad, Pakistan

ABSTRACT

Objective: To find the frequency of various clinical features and the underlying causes of pancytopenia in patients reporting to a tertiary care hospital in Rawalpindi.

Study Design: Cross sectional observational study.

Place and duration of study: This study was conducted in the Department of Haematology (Pathology), Army Medical College, Rawalpindi from January 2014 to December 2014.

Patients and methods: Patients of all age groups having pancytopenia were included. Documentation of patients' history and physical examination was done. Complete blood counts were done using automated blood analyzer. Bone marrow aspiration and biopsy were done following standard protocols and were evaluated microscopically for determining the cause of pancytopenia.

Results: During study duration, 330 patients were received from different units of tertiary care hospital for bone marrow examination and 70 (21.2%) patients were found to have pancytopenia. Commonest clinical features were pallor seen in 61 (87.14%) patients followed by fever and lassitude noted in 42 (60%) patients each. Commonest causes of pancytopenia found were megaloblastic anaemia and aplastic anaemia in 18 (25.71%) and 15 (21.42%) patients respectively.

Conclusion: Pancytopenia is observed as quite a common finding in our patient population. Megaloblastic anaemia is the commonest cause of pancytopenia followed by aplastic anaemia.

Keywords: Aplastic anaemia, Bone marrow, Megaloblastic anaemia, Pancytopenia.

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INTRODUCTION

Pancytopenia is the simultaneous occurrence of anaemia, leucopenia and thrombocytopenia. It is a common finding in our patients. Known causes of pancytopenia include aplastic anaemia (AA), acute leukaemia, myelodysplastic syndrome (MDS), bone marrow infiltration by lymphoma, solid tumours, fibrosis or granulomas, megaloblastic anaemia (MA) and hypersplenism¹. The frequencies of different conditions causing pancytopenia vary in different western and local studies.

In our patient population little work has

been done on pancytopenia. The purpose of this study was to find the frequency of pancytopenia and to determine the commonest clinical features and underlying causes of pancytopenia in our patients.

PATIENTS AND METHODS

This cross sectional study was carried out at the Clinical Pathology Laboratory (CPL) of Army Medical College Rawalpindi, over a period of one year from January 2014 to December 2014. Patients of all age groups and of either sex presenting with pancytopenia for the first time were included. Patients were divided into children (upto 18 years of age), young adults (>18-40 years), middle aged (>40-60 years) and the elderly (>60 years). Patients were considered pancytopenic if their haemoglobin was <10g/dl, leukocytes <4.0x10⁹/l and platelets < 150x10⁹/l.

Correspondence: Dr Umbreen Arshad, PG Trainee, Pathology Dept, Army Medical College, Rawalpindi, Pakistan
Email: redrose961@gamil.com

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Patients of pancytopenia on treatment were not included in this study.

Detailed history of signs and symptoms and physical examination was conducted and findings were recorded on a proforma. Two ml of blood was taken from each patient, in EDTA tube from the antecubital vein under aseptic measures

was done with standard protocol and then processed and stained on an automated tissue processor and stainer^{2,3}. Haematoxylin and eosin stained slides were examined under microscope by the pathologist for making a diagnosis^{2,3}.

Data was analyzed statistically, using SPSS version 21 for parameters which included age,

Table-1: Distribution of underlying clinical causes of pancytopenia (n=70).

S. No.	Causes of pancytopenia	Frequency (%)
1	Megaloblastic anaemia	18 (25.71%)
2	Aplastic anaemia	15 (21.42%)
3	Infections/septicaemia	07 (10%)
4	Hypersplenism	07 (10%)
5	Myelodysplastic syndrome	06 (8.57%)
6	Metastatic carcinoma	05 (7.14%)
7	Mixed deficiency anaemia	04 (5.71%)
8	Acute leukaemia	03 (4.28%)
9	Visceral leishmaniasis	03 (4.28%)
10	Multiple myeloma	01 (1.43%)
11	Gaucher's disease	01 (1.43%)

Table-2: Frequencies of various signs and symptoms.

Signs and symptoms	Frequency (%)
Pallor	61 (87.14%)
Lassitude/ shortness of breath on accustomed exertion	42 (60%)
Fever	42 (60%)
Gastrointestinal symptoms (Vomiting , loose motions)	37 (52.85%)
Body aches	33 (47.14%)
Respiratory symptoms (sore throat, cough)	32 (45.71%)
Splenomegaly	21 (30%)
Bleeding	20 (28.57%)
Jaundice	09 (12.85%)
Lymphadenopathy	04 (5.71%)

for complete blood counts (CBC) and peripheral blood film. Complete blood count was done on automated haematology analyzer Sysmex KX-21.

Peripheral blood film was made on a clean slide, stained by Leishman stain and was examined by the pathologist under microscope. Bone marrow (BM) aspiration and trephine biopsy were done after an informed consent. Smears from BM aspirate were stained with Leishman and Perl stains². Bone marrow biopsy

sex, clinical features and underlying causes of pancytopenia.

RESULTS

A total of 70 patients were diagnosed as having pancytopenia during the period of study. These included 50 (71.4%) males and 20 (28.6%) females, showing male to female ratio 2.5:1. Ages of pancytopenic patients ranged from 6 months to 90 years with a mean age of 46.6 years and a median age of 50 years. Pancytopenia was seen in

8 (11.4%) children; 20 (28.6%) adults; 23 (32.8%) middle aged and 19 (27.1%) elderly patients.

Frequency of various causes of pancytopenia in our patients is shown in table-I. Frequencies of

of different causes of pancytopenia according to age groups is given in table-III.

In 3 patients with acute leukaemia, 2 had acute lymphoblastic leukaemia and one had acute

Table-3: Distribution of various causes of pancytopenia according to age groups.

Age groups	Causes of pancytopenia	Frequency (%)
Children (<18 years) n= 8 (11.4%)	Aplastic anaemia	3 (37.5%)
	Infections/ septicaemia	2(25%)
	Myelodysplastic syndrome	1 (12.5%)
	Visceral leishmaniasis	1 (12.5%)
	Gaucher's disease	1 (12.5%)
Young (>18-40 years) n= 20 (28.6%)	Megaloblastic anaemia	5 (25%)
	Aplastic anaemia	3 (15%)
	Infections/septicaemia	3 (15%)
	Hypersplenism	3 (15%)
	Metastatic carcinoma	2 (10%)
	Myelodysplastic syndrome	1 (5%)
	Mixed deficiency anaemia	1 (5%)
	Acute leukaemia	1 (5%)
	Visceral leishmaniasis	1 (5%)
Middle aged (>40-60 years) n=23 (32.8%)	Megaloblastic anaemia	7 (30.4%)
	Aplastic anaemia	5 (21.7%)
	Hypersplenism	3 (13.0%)
	Myelodysplastic syndrome	2 (8.7%)
	Acute leukaemia	2 (8.7%)
	Infections/septicaemia	1 (4.3%)
	Metastatic carcinoma	1 (4.3%)
	Mixed deficiency anaemia	1 (4.3%)
	Visceral leishmaniasis	1 (4.3%)
Elderly (>60 years) n= 19 (27.1%)	Megaloblastic anaemia	6 (31.6%)
	Aplastic anaemia	4 (21.0%)
	Myelodysplastic syndrome	2 (10.5%)
	Metastatic carcinoma	2 (10.5%)
	Mixed deficiency anaemia	2 (10.5%)
	Infections/septicaemia	1 (5.2%)
	Hypersplenism	1 (5.2%)
	Multiple myeloma	1 (5.2%)

various signs and symptoms seen in patients with pancytopenia are charted in table-II. Distribution

myeloid leukaemia. In 6 patients having myelodysplastic syndrome 3 patients were diagnosed with refractory anaemia with excess

blasts type-1, 2 patients with refractory cytopenia with multi lineage dysplasia and 1 patient with childhood myelodysplasia.

DISCUSSION

Pancytopenia is one of the common findings in the patients that clinicians come across in routine clinical practice. It is also one of the major indications for bone marrow (BM) examination. We found every fifth patient reporting to our lab for BM examination had pancytopenia. Pancytopenia was 2.5 times more common in males compared to females. Other studies also show greater incidence of pancytopenia in males in comparison to females^{4,5}. The difference is more pronounced in our study and male to female ratio matches the ratios mentioned by Jalbani et al, Aziz et al, and Jain et al in their studies^{4,5}.

In this study patients' age ranged from 6 months to 90 years with the mean age of 46.6 years, showing that pancytopenia occurs in all age groups. However the frequencies of various underlying causes varied in the different age groups as shown in table -III.

Pallor and lassitude were the commonest symptoms, both quite obviously attributable to anaemia. Fever was also a common clinical finding seen in 60% of patients. In patients with aplastic anaemia and leukaemia, the fever could be ascribed to neutropenia. On the other hand in patients suffering from Leishmania or viral infections, pathogenesis of both fever and pancytopenia could be directly attributed to the underlying infections.

Loose motions were present in about half of the patients and were mainly seen in patients with MA. The cause of loose motions in MA is the epithelial changes of the gastrointestinal tract because of vitamin B12 or folate deficiency⁶.

Enlarged spleen, considered as an important cause of pancytopenia, was seen in 21 (30%) patients. It not only contributes to pancytopenia in patients with acute infections, acute leukaemia, visceral Leishmaniasis, and Gaucher's disease but

is also a major feature of clinical syndrome referred to as hypersplenism⁷.

In children AA was the commonest cause of pancytopenia. Studies by Jan et al and Memon et al have also reported AA as the commonest cause of pancytopenia in children^{8,9}. In all the age groups, except for the children, MA was the commonest cause of pancytopenia followed by AA. Similar findings have been reported by Niazi et al and Aziz et al from Pakistan and Tilak et al, Khunger et al and Gayathri et al from India^{5,10-13}. On the other hand some studies have stated AA at the top in the list of causes of pancytopenia^{14,15}.

Preventable and relatively easily treatable causes of pancytopenia such as MA, mixed deficiency anaemia and infections including leishmaniasis comprised nearly half of the cases of pancytopenia. This not only highlights the importance of preventive measures at community level to control nutritional deficiencies and infections, but also underscores the significance of their early diagnosis and treatment.

CONCLUSION

Pancytopenia is a common haematological finding encountered in routine clinical practice. Aplastic anaemia and MA are the commonest underlying causes in children and adults respectively. Patients of pancytopenia should be properly evaluated as many of its causes are easily treatable and an early diagnosis can help reduce the patient's sufferings.

CONFLICT OF INTEREST

This study has no conflict of interest to declare by any author.

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