Original Research Paper

Volume - 12 | Issue - 08 | August - 2022 | PRINT ISSN No. 2249 - 555X | DOI : 10.36106/ijar

Haematology

CLINICO-HEMATOLOGICAL PROFILE AND ETIOLOGICAL SPECTRUM OF PANCYTOPENIA

Dr. Bhagirath B Solanki — Professor and Head of unit, Dept. of Medicine, B.J. Medical college, Civil Hospital, Ahmedabad.

Dr. Kalpesh K Agrawal — Senior resident, Dept. of Medicine, B.J. Medical college, Civil Hospital, Ahmedabad.

ABSTRACT **Background:** Pancytopenia is a common hematological problem characterized by anemia, leucopenia and thrombocytopenia. It is a striking feature of many serious and life threatening illnesses. The disease pattern varies in different population groups, in age pattern, nutritional status and prevalence of infective disorder. Present study was conducted to assess the etiology, clinical profile and bone marrow morphology of pancytopenia.. **Objectives:** 1. To study the clinical presentations and hematological parameters in patients with pancytopenia. 2. To study the morphological pattern in bone marrow in patients with pancytopenia. **Methodology:** It was a observational study, and 50 pancytopenic patients were evaluated clinically, along with hematological parameters and bone marrow study in Department of Medicine, B.J. Medical college, Civil Hospital, Ahmedabad, during the period of June 2019 to September 2021. **Results:** Among 50 cases studied, mean age of pancytopenia in this study was 46.1 years, male to female ratio was 1.08:1. Most of the patients presented with generalized weakness and fever. The commonest physical finding was pallor, followed by splenomegaly. Anisopoikilocytosis was the predominant blood picture. The commonest marrow finding was hypercellularity with megaloblastic erythropoiesis. The commonest cause for pancytopenia was megaloblastic anemia (50%), followed by hypersplenism (10%). **Conclusion:** Large number of patients with pancytopenia had reversible etiology. Hence complete work up including clinical details with hematological examination along with bone marrow study will lead to early and proper diagnosis of case followed by proper treatment

KEYWORDS :

INTRODUCTION

Cytopenia is a reduction in any of the three types of peripheral blood cell. A reduction in all the three of cellular components is termed pancytopenia and this involves anemia, leukopenia, and thrombocytopenia. Initially mild impairment in marrow function may go undetected and pancytopenia may become apparent only during times of stress or increased demand (e.g. Bleeding or infection). The presenting symptoms are usually attributable to anemia or thrombocytopenia. Pancytopenia is a striking feature of many serious and life threatening illness ranging from simple drug induced bone marrow hypoplasia, megaloblastic marrow to fatal bone marrow aplasias and leukemias. Clinical features are those due to pancytopenia per se, and those due to of the disorder with a different epidemiology, pathophysiology, clinical presentations, and clinical outcomes; identification of diseases is of primary importance, since this is the key to appropriate management. As a large proportion of pancytopenia is of reversible aetiology, early& accurate diagnosis may be lifesaving. Whereas the severity of pancytopenia and the underlying pathology determines the management and prognosis of the patients.

MATERIALS AND METHODS

It was a observational study, and 50 pancytopenic patients were evaluated clinically, along with hematological parameters and bone marrow study in Department of Medicine, B.J. Medical college, Civil Hospital, Ahmedabad, during the period of June 2019 to September 2021.

Study was carried out with following inclusion criteria:

- Patient of either sex with age >12 years.
- Haemoglobin level for male patients <13.5 gm/dl and for female patients <11.5gm/dl, leukocyte count < 4000/cubic mm, platelet count <1.5lakh/cubic mm.

Following patients were excluded from the study:

- Critically ill, intensive care unit patients.
- Patient not willing for further investigation.
- Diagnosed cases of malignancy and leukemia.
- Patients who were receiving chemotherapy or radiotherapy.

A complete history including presenting complaints, past history with specific to drug intake and radiation exposure have been taken. General examination was carried out and specific emphasis was given to pallor, icterus, petechiae, skin changes and lymphadenopathy. All systems were examined in detail.

OBSERVATION AND RESULTS

Table No I: Age Wise Distribution Of Patients

AGE IN YEARS	NO OF PATIENTS (n=50)	PERCENTAGE
< 30	13	26%
31-40	07	14%
41-50	10	20%
51-60	07	14%
>60	13	26%

Table No II: Sex Distribution Of Patients

SEX	NO OF PATIENTS (n=50)	PERCENTAGE
MALE	26	52%
FEMALE	24	48%

Table No III: Symptoms Wise Distribution Of Cases

SYMPTOMS	NO OF PATIENTS (n=50)	PERCENTAGE (%)
EASY FATIGUABILITY	45	90
FEVER	20	40
BREATHLESSNESS ON EXERTION	16	32
DECREASED APPETTITE	12	24
PALPITATION	10	20
BLEEDING MANIFESTATION	10	20

Table No IV: Signs Wise Distribution Of Cases

SIGNS	NO OF PATIENTS (n=50)	PERCENTAGE
PALLOR	50	100%
ICTERUS	6	12%
KNUCKLE PIGMENTATION	5	10%
PEDAL EDEMA	9	18%
LYMPHEDENOPATHY	9	18%
PURPURIC SPOTS	3	6%
GLOSSITIS	6	12%

SPLENOMEGALY	19	38%
HEPATOMEGALY	7	14%
ASCITES	4	8%
HAEMIC MURMUR	7	14%

Table N0 V: Cause Wise Distribution Of Cases

CAUSES	NO OF PATIENTS (n=50)	PERCENTAGE(%)
MEGALOBLASTIC ANAEMIA	25	50
HYPERSPLENISM	05	10
APLASTIC ANAEMIA	04	08
MALARIA	03	06
HIV WITH DISSEMINATED TB	01	02
SLE	02	04
PLASMA CELL DYSCRASIAS	02	04
MYELODYSPLASTIC SYNDROME	02	04
HEMOPHAGOCYTIC LYMPHOHISTIOCYTOSIS	02	04
ACUTE MYELOID LEUKEMIA	02	04
NON-HODGKINS LYMPHOMA	02	04

Table No VI: Hemoglobin Leve

HB LEVEL (gm/dl)	NO OF PATIENTS(n=50)	PERCENTAGE (%)
<7	36	72
7 & more	14	28

Table No VII: Leucocyte Count

LEUCOCYTE COUNT (cells / mm3)	NO OF PATIENTS (n=50)	PERCENTAGE
LESS THAN 2000	16	32%
2100-3000	17	34%
3100- 4000	17	34%

Table No VIII: Platelet Counts

PLATELET COUNT(cubic mm)	NO OF PATIENTS (n=50)	PERCENTAGE
≤50000	27	54%
>50000 – 150000	23	46%

Table IX: Co-relation Between S.vit B12 And Mcv Levels

S. Vit B12 (pg/ml)	MCV (fl) (n=50)		Chi square value- 11.68 P value = 0.0006
	>99	≤99	
<200	17	8	
200 and more	5	20	

Table X: Peripheral Blood Smear Findings

Causes	No. of Patients	A	B	C	D	E	F	G
Megaloblastic anaemia	25	24	3	15	3	5	0	0
Hypersplenism	5	5	0	0	0	0	0	0
aplastic anaemia	4	3	0	1	1	0	0	0
Malaria	3	2	0	0	2	1	0	0
systemic lupus erythematosus	2	1	0	0	1	1	0	1
plasma cell dyscrasias	2	2	1	0	0	1	0	0
myelodysplastic syndrome	2	2	1	1	1	0	0	0
Hemophagocytic lymphohistiocytosis	2	1	0	0	0	0	0	0
HIV with disseminated TB	1	0	0	0	0	0	0	0
acute myeloid leukemia	2	0	1	0	0	0	0	0
non hodgkins lymphoma	2	2	0	0	1	0	0	0
Total	50	43	6	17	10	8	0	0

(A- Anisopoikolocytosis, B- Immatture WBC, C- Hypersegmented neutrophils, D- Activated lymphocytes, E- lymphocytosis, F- Immature RBCs, G- Increased Reticulocytes)

In the present study, we could do bone marrow in only 20 patients(40%),findings of which are tabulated below,

Table No XI: Bone Marrow Cellularity

Bone marrow findings	No of Patients (n=20)	Percentage(%)
Hypercellular	14	70
Hypocellular/Acellular	4	20
Normocellular	2	10

DISCUSSION

- 13(26%) cases of pancytopenia were between 2nd and 3rd decade of life and 13 cases(26%) were of more than 60 yrs of age.
- Mean age of pancytopenia in this study was 46.1years.
- Male to Female ratio was 1.08:1.
- In majority of patients 25(50%), Megaloblastic anemia was the cause of pancytopenia.
- The second common cause of pancytopenia in study was Hypersplenism(10%). Other causes were Aplastic anaemia(8%), Malaria(6%), SLE(4%), plasma cell dyscrasias(4%), myelodysplastic syndrome(4%), HLH(4%), AML(4%), NonHodgkins lymphoma(4%).
- The most common presenting symptom in present study was easy fatiguability in 90% of patients. Second most common presenting symptom in present study was fever present in 40% of cases.
- The most common sign on examination in present study was pallor found in all 50(100%) cases. It is mainly due to decreased Hb level. Other signs were Icterus in 06(12%), Splenomegaly in 19(38%) and Skin changes like hyperpigmentation in 05(10%) cases.
- In present study majority of cases, 36(72%) had Hb<7gm/d1 suggesting moderate to severe anemia.
- 17(34%) cases had total leukocyte count between 2100-3000/mm3. 17(34%) cases had total leukocyte count between 3100-4000, while 16(32%) had severe leucopoenia (<2000/mm3).
- In present study, majority 27(54%) patient had platelet count less than 50,00/mm3.
- In present study we could do bone marrow in only 20(40%) patients, because many patients and their relative gave negative consent for invasive procedure. Here, due to small sample size, we cannot come to conclusion which is statistically significant. In present study, 14(70%) had hypercellular bone marrow, 4(20%) had hypocellular bone marrow and only 2(10%) had normocellular bone marrow.
- Mean MCV of patients with megaloblastic anaemia is 107.5 while those with non-megaloblastic anaemia is 79.9 in present study.
- Most common peripheral smear finding overall is anisopoikolocytosis, while in patients with megaloblastic anaemia, most common PS findings are tear drop cells followed by hypersegmented neutrophils and eliptocytes f/b macro-ovalocytes.

CONCLUSION

Pancytopenia itself is not a disease but a manifestation having diverse etiologies. Absolute reticulocyte count serves as an important indicator for determining the function of bone marrow. It should be done along with peripheral smear in the very beginning. From our study it can be proposed that inspite of numerous etiology available for pancytopenia and its various manifestations the most common etiology is the megaloblastic anaemia. And the most common reason for megaloblastic anaemia is vit B12 deficiency, so its screening should be initial investigation irrespective of the diet of a patient.

In many cases of pancytopenia, peripheral smear study provides an inconclusive evidence , so bone marrow aspiration a safer invasive procedure was helpful to find out the etiological cause.

In addition early recognition of underlying etiology to be made, so that treatable causes are identified without any delay.

REFERENCES

1 Braunwald E, Fauci AS, Kasper KL, Hauser, Lango, Jameson eds. Harrison – s Principles of internal Medicine. 20th ed. New York : mcgrawHill;2008

2. Imbert, et.al. Adult patients presenting with pancytopenia. Hematology Pathology, 1989;3 (4):159-167.
3. Kumar R, Karla SP, Kumar H, Anand AC, Madan M. Pancytopenia- A six year study. JAPI, 2001; 49:1079-81
4. William WJ, Bentkr E, ErskvAj, Hematology - fifth International edition.
5. Gayathri B N et al ; pancytopenia: A clinical hematological study. Journal of laboratory physician, Jan-Jun 20 II, vol- 3, issue 1.
6. KishorKhodke, S Marwah, G Buxi, RB Yadav, NK Chaturvedi, Bone marrow Examination in cases of pancytopenia, Journal of Indian Academy of clinical medicine. Jan- Jun 2001, vol 2, no.1 &2.