Scholars Journal of Applied Medical Sciences
Abbreviated Key Title: Sch J App Med Sci
ISSN 2347-954X (Print) | ISSN 2320-6691 (Online)
Journal homepage: www.saspublishers.com

OPEN ACCESS

Pathology

A Two Year Cross Sectional Study on Pancytopenia Cases at a Tertiary Care Centre of Saurashtra

Dr. Nayan Koitiya, Dr. Krupal Pujara*

P.D.U. Government Medical College, Civil Hospital Campus, Rajkot Gujarat, India

***Corresponding author:** Dr. Krupal Pujara
| **Received:** 17.03.2019 | **Accepted:** 27.03.2019 | **Published:** 30.03.2019
DOI: 10.36347/sjams.2019.v07i03.068

Abstract **Original Research Article**

Background*:** Pancytopenia means a condition in which blood elements (red blood cells, white blood cells, platelets) are decreased than normal. It is striking feature of many lives threatening illness, ranging from simple drug induced bone marrow hypoplasia, megaloblastic anemia to fatal bone marrow aplasias & leukemias. Identification of the correct cause will help in implementing appropriate therapy. Common questions that arise among the healthcare professional are: What are the most common causes of pancytopenia? And what is the best diagnostic approach to the pancytopenia patient? ***Methods: This prospective study was carried out from September 2012 to August 2014 at Pathology department, P.D.U medical college, Rajkot. The cases were selected on the bases of inclusion criteria after taking written & informed consent. Permission from ethical committee for this study was obtained before starting the study. ***Result:*** Megaloblastic anemia was the commonest cause of pancytopenia followed by aplastic anemia, granulomatous lesion, SLE, dengue, malaria, MDS, Plasma cell dyscrasia. ***Conclusion:*** Amongst the patients presenting with pancytopenia, 77% patients had megaloblastic anemia, 5% patients had aplastic anemia, 5% patients had leukemia, 4% patients had hypersplenism, 2% patients had granulomatous disease, 2% patients had SLE, 2% patients had malaria, 1% patients had dengue, 1% patients had MDS, 1% patients had plasma cell dyscrasia. In present study, most common age group affected was 21 to 30 years followed by 11 to 20 years. In present study, 65% of affected patients were males, and 35% patients were female so, male to female ratio is 1.85:1.

Keywords: Pancytopenia, Megaloblastic anemia, plasma cell dyscrasia, Aplastic anemia.

INTRODUCTION

Pancytopenia means a condition in which blood elements (red blood cells, white blood cells, platelets) are decreased than normal. It is striking feature of much life threatening illness, ranging from simple drug induced bone marrow hypoplasia, megaloblastic anemia to fatal bone marrow aplasias & leukemias. The spectrum of primary diseases like infections, immune mediated attack and secondary diseases like malignant cell infiltration that affect the bone marrow may manifest as pancytopenia [1]. Increased destruction in peripheral blood, sequestration and then destruction by enlarged spleen may also manifest as pancytopenia. The severity of pancytopenia & underlying pathology determine the management & prognosis. Thus, Identification of the correct cause will help in implementing appropriate therapy [2]. Few clear recommendations can be found for investigative approach to pancytopenia. Some experts suggest that marrow examination is essential to the diagnosis, but it is not established whether the procedure is necessary in all pancytopenia patients. Common questions that arise among the healthcare professional are: 1) what are the most common causes of pancytopenia? 2) What is the best diagnostic approach to the pancytopenia patient? In the present study, we had tried to answer these questions. Patient admitted in general medical and pediatric ward with pancytopenia with different etiology and different clinical presentations were studied. On the basis of the findings and available literature, common causes of pancytopenia, their clinical features & findings were studied.

MATERIALS AND METHODS

This prospective study was carried out from September 2012 to August 2014 at Pathology department, P.D.U medical college, Rajkot. The cases were selected on the bases of inclusion criteria after taking written & informed consent. Permission from ethical committee for this study was obtained before starting the study.

Methods of collection of data

- ***Source of data:*** All the samples for study were coming from various clinical wards like medical

ward, surgical ward, orthopedic ward, paediatric ward and TB & chest ward.

- ***Sample size:*** Hundred (100) patients with pancytopenia.
- ***Sampling procedure:*** All the cases presented with pancytopenia during the study period were included in the study. Hundred (100) Patients with pancytopenia admitted various wards in our hospital were studied.

Selection criteria

Inclusion criteria

All the patient of all ages & both sex having,

- Hemoglobin - < 9.0 gm/dl,
- Total Leukocyte Count - <4000 cells/cumm,
- Platelet Count - < 1.4 lacs/cumm, were included in study.

Exclusion criteria

Patients on chemoradiotherapy

Samples were then further preceded in the Central Clinical Laboratory of pathology department of P.D.U. Medical College at the O.P.D. building of Rajkot.

- From Samples, First EDTA blood sample was runned in automated hematology cell counter, and then a peripheral smear was made on glass slide.
- This air dried slides were then fixed in the methanol.
- Fixed slides were stained in field stain.
- Stained slides were examined microscopically.
- Bone marrow aspiration was done on request of clinician to detect causes of pancytopenia.

Obtained Bone marrow material was spreaded over glass slides immediately than fixed with help of methanol & than stained with field stain & examined microscopically.

RESULTS AND DISCUSSIONS

There were 65 males and 35 females, and their ages ranged from 3 year to 80 years with the mean age of 42 years. It was observed that among the cases of the pancytopenia, weakness (due to anemia)(91%) was the most common presenting symptom followed by fever (due to leucopenia)(78%). Other symptoms included bleeding tendencies (41%), breathlessness (39%), palpitations (37%), vomiting (36%), anorexia (35%), giddiness (33%), bodyache (32%), abdominal pain (32%), and cough (31%). It was observed that among the cases of the pancytopenia, pallor was seen in all patients at the time of presentation followed by petechie (21%) & glossitis (19%), hepatosplenomegaly (15%), jaundice (12%), lymphadenopathy (7%). It was observed that among the cases of the pancytopenia, 42% patients had dimorphic p/s picture, 40% patients had macroovalocytic p/s picture, 9% patients had normochromic normoocytic p/s picture, 9% patients had hypochromic microcytic p/s picture.

Table-1: Bone marrow findings in patients with pancytopenia in study population

Bone marrow findings	No. of patients
Megaloblastic Anemia	66
Aplastic anemia	06
Leukemia	05
Hypersplenism	03
Malaria	01
Granulomatous disease	02
MDS	01
Plasma Cell Dyscrasia	01
Total	85

Table-2: Etiology of pancytopenia in study population

Etiology Diagnosis	Total
Megaloblastic Anemia	76
Aplastic Anemia	06
Leukemia	05
Hypersplenism	04
SLE	02
Granulomatous disease	02
Malaria	02
Dengue	01
MDS	01
Plasma Cell Dyscrasia	01
Total	100

Peripheral smear

In the current study , on peripheral smear majority (42%) patients had dimorphic p/s picture followed by 39% patients had macroovalocytic p/s picture, 10% patients had normochromic normoocytic p/s picture, 9% patients had hypochromic microcytic p/s picture.

In Megaloblastic anemia, out of 76 patients, 37 patients had macroovalocytic (48.7%), 39 patients had dimorphic picture (51.3%). Hypersegmented neutrophils were found in 76 out of 76 patients (100%) with megaloblastic anemia. Anisopoikilocytosis was the predominant finding in megaloblastic anemia along with macroovalocytes.

In Aplastic anemia, out of 6 patients, 3 patients had normochromic normocytic picture (50%) & 2 patients had dimorphic picture (33.34%) and 1 patients had hypochromic microcytic (16.66%).

An Indian study [3] involving 50 cases found hypersegmented neutrophils in 40% cases, dimorphic picture in 20% cases, microcytic hypochromic picture in 20% pf cases, circulating erythroblasts in 8% cases and reticulocytosis was seen in 6% of cases.

Bone marrow examination

In the present study bone marrow examination was done in 85 patients of whom majority of patients showed hypercellular picture followed by diluted marrow & acellular and normocellular picture.

Bone marrow examination was done in all patients with megaloblastic anemia out of which all (100%) had hypercellularity.

One study in France [4] involving 213 cases found hypercellular marrow (66%) in patients with pancytopenia, where malignant myeloid disorder (42%) was the commonest cause for pancytopenia.

Most patients with megaloblastic anemia who underwent bone marrow examination had hypercellular marrow. Typical megaloblasts with sieved chromatin and giant metamyelocytes were found in megaloblastic anemia patients.

One case of refractory anemia (1%), on doing detailed bone marrow examination turned out to be Myeloid Dysplastic Syndrome. Bone marrow examination in this patient had hypercellular marrow with dyserythropoeisis, dysmyelopoeisis, dysmegalopoeisis.

In a study involving [5] 148 patients found on bone marrow examination that hypoplastic bone marrow (29.5%), megaloblastic marrow (23.64%), hematological malignancies (21.62%), erythroid hyperplasia (19.6%) and normal bone marrow (93.38%).

The commonest cause of pancytopenia, reported from various studies throughout the world has been aplastic anemia. This is in sharp contrast with the results our study, where the commonest cause of pancytopenia was megaloblastic anemia. This seems to reflect the higher prevalence of nutritional deficiency of vitamin B12 and folic acid in Indian subjects.

CONCLUSION

Amongst the patients presenting with pancytopenia, 77% patients had megaloblastic anemia and, 5% patients had aplastic anemia, 5% patients had leukemia, 4% patients had hypersplenism, 2% patients had granulomatous disease, 2% patients had SLE, 2% patients had malaria, 1% patients had dengue, 1% patients had MDS, 1% patients had plasma cell dyscrasia. In present study, most common age group affected was 21 to 30 years followed by 11 to 20 years. In present study, 65% of affected patients were males, and 35% patients were female and so, male to female ratio is 1.85:1. Pancytopenia was observed in younger age group more commonly than in elderly. In younger age group causes of pancytopenia are megaloblastic anemia.Megaloblastic anemia was found more common in males.

In majority of megaloblastic anemia cases, cause was nutritional deficiency of vitamin B12 and folic acid, which was corrected in majority of patients with proper treatment and follow up. Features suggestive of anemia were commonly seen followed by leucopenia and thrombocytopenia. Weakness was most common presenting symptom of megaloblastic anemia. Patients with infective disorders like malaria and dengue had fever as predominantly symptoms besides easy fatigability. Pallor was the most common presenting clinical sign in almost all cases followed by petechie & glossitis. Hepatosplenomegaly was found in all patients with hypersplenism, megaloblastic anemia, acute leukemia, MDS, Plasma cell dyscrasia, malaria. Majority of patients with severe anemia had weakness. Majority of patients with low total leukocyte count had fever, though the correlation was statistically nonsignificant, Bleeding tendencies were very common in patients with low platelet count and vice versa, the correlation being statistically significant. Megaloblastic anemia was more common in patients with vegetarian diet. Macroovalocytes on peripheral smear was a better predictor of megaloblastic anemia. Peripheral smear was conclusive to arrive at diagnosis of pancytopenia in most of the cases. Majority of the patients had dimorphic blood picture (42%) on peripheral smear followed by macroovalocytic blood picture (39%). Hypersegmented neutrophils in peripheral smear were very sensitive and specific for diagnosis megaloblastic anemia. Bone marrow examination was done in 85 patients out of which majority had megaloblastic

anemia followed by aplastic anemia, leukemia, granulomatous disease, myelodysplastic syndrome, plasma cell dyscrasia. In megaloblastic anemia and infection like malaria and dengue, pancytopenia was transient and responds well to treatment.

REFERENCES

1. Williams WJ, Bentkr E, Erskv AJ. Haematology 8th Ed. Singapore: McGraw Hill Book Company. 2011.
2. Varma N, Dash S. A reappraisal of underlying pathology in adult patients presenting with pancytopenia. Trop Geogr Med. 1992; 44(4): 322-7.
3. Khodke K, Marwah S, Buxi G, Yadav RB, Chaturvedi NK. Bone Marrow Examination in Cases of Pancytopenia. Journal Indian Academy of Clinical Medicine. 2001; 2: 55-9.
4. Young N, Maciejewski G. The Pathophysiology of Acquired Aplastic Anemia. N Engl J Med. 1999; 336: 1365-1372.
5. Jha A, Sayami G, Adhikari RC, Patna AD. Bone marrow Examination in Cases of Pancytopenia. J Nepal Med Assoc. 2008; 47(169): 12-7.