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Pancytopenia: A Prospective Clinico-Pathologiacl Study in a Tertiary Care Centre Jammu

Roopali J[1], Mehnaz C[2], Singh K[3]

Government Medical College, Jammu, India

Abstract: ***Introduction: Pancytopenia is defined as a triad of findings that result from decrease in hemoglobin <10gm/dl (anemia), white blood cell count <4000/mm^3 (leucopenia) and platelet count <100,000/mm^3 (thrombocytopenia). The present study was carried out in patients diagnosed with pancytopenia visiting to our hospital in order to find the incidence of various etiological factors with clinical details, hematological findings and bone marrow (BM) aspiration whenever possible. Method and Material: The present prospective study was undertaken for a period of 1 years, from September 2017 to September 2018, at Postgraduate Department of Pathology, Government Medical College, Jammu, India. Patients of all agegroups and both sexes were included. Bone marrow aspiration was subsequently carried outunder aseptic precaution after obtaining written consent from the patient or guardian. Patients on chemotherapy and immunosuppressive treatment were excluded. Results: Out of 79 cases 43 were females and 36 were males. The age varied from (1.5-83) years.The major presentation of the patients with pancytopenia was megaloblastic anemia. The most common clinical symptom was generalised weakness. Conclusion: Pancytopenia is most common hematological condition in routine clinical practice.Therefore, the clinical findings and the hematological analysis along with bone marrow aspiration examination are very important for an early diagnosis as most of the causes are treatable and an early intervention can be taken which in return decreases the burden on the patient and enhance the survival rate.***

Keywords: Pancytopenia, Haemoglobin, Total leucocyte count, Platelet

1. Introduction

Pancytopenia is defined as a triad of findings that result fromdecreasein hemoglobin <10gm/dl (anemia), white blood cell count <4000/mm^3 (leucopenia) and platelet count <100,000/mm^3 (thrombocytopenia).[1]

The etiology of pancytopenia variesdepending on the age,nutritional status, geographical location and the prevalence of infections in a particular area. Some are treatable, however, in some early diagnosis and supportive treatment can decrease morbidityand mortality rate.[2,3]

Clinically patient presents with pallor, dyspnea, bleeding and increased tendency toinfections which can vary according to the geographical area and genetic mutations.[4]

The present study was carried out in patients diagnosed with pancytopenia visiting to our hospital in order to find the incidence of various etiological factors with clinical details, hematological findings and bone marrow (BM) aspiration whenever possible.

2. Method and Material

The present prospective study was undertaken for a period of 1 years, from September 2017 to September 2018, at Postgraduate Department of Pathology, Government Medical College, Jammu, India. Patients of all agegroups and both sexes were included. Case selectionwas based on clinical features and supported by laboratory evidence, which included peripheral blood counts for hemoglobin, leukocytes and platelets. Inclusioncriteria were presence of all 3 of the following: hemoglobin,<10 g/dL; total leukocyte count (TLC), <4,000 /mm^3 ;platelet count, <100,000/mm^3.

Twomilliliters of EDTA (ethylene diamine tetra-acetic acid)anticoagulated blood was collected and processed through automated hematology analyzer; and hematological parameters were obtained, whichincluded hemoglobin, red blood cell count, total leukocytecount, differential leukocyte count, platelet count, meancorpuscular volume (MCV), mean corpuscular hemoglobin(MCH), mean corpuscular hemoglobin concentration(MCHC), packed cell volume (PCV). Peripheral smear was stained byLeishman stain for all the cases and examined in detail.

Bone marrow aspiration was subsequently carried outunder aseptic precaution after obtaining written consentfrom the patient or guardian.

Patients on chemotherapy and immunosuppressive treatment were excluded.

Aim and Objective

To identify the prevalence of pancytopenia and analyze the clinico-hematological features associated with it.

3. Results

Out of 79 cases 43 were females and 36 were males. The age varied from (1.5-83) years. **(figure 1)**

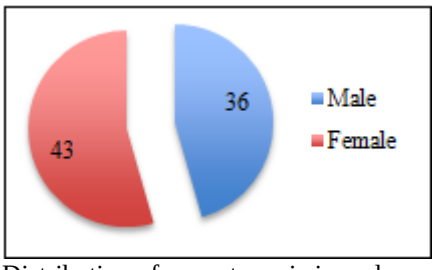

Figure 1: Distribution of pancytopenia in males and females

The major presentation of the patients with pancytopenia was megaloblastic anemia, which comprised of 59 (74.68%) of the cases. This was followed by acute leukemia in 9 (11.39%) cases (Table 1).

Table 1: Incidence of various causes of pancytopenia

Causes	*No. Of Cases*	*Percentage*
Megaloblastic anemia	59	74.68%
Acute leukemia	9	11.39%
Dual deficiency	5	6.32%
MDS	2	2.53%
Aplastic anemia	2	2.53%
Multiple myeloma	2	2.53%

Among the common clinical symptoms, the most common one was generalised weakness (100%) followed by pallor (90%). Fever, Dyspnea and hepatomegaly were also seen in considerable number of cases. (Table 2)

Table 2: Haematological parameters in three subgroups of pancytopenia

CAUSES	Parameters		
	Haemoglobin (g/dl)	Total Leucocyte Count (mm^3)	Platelet (mm^3)
Megaloblastic anemia	1.6-9.4	1600-3800	12000-94000
Acute leukemia	2.4-8	2000-3800	20000-60000
Dual deficiency	1.8-4	5400	26000-98000
MDS	5.7-7	1000-3800	35000-70000
Aplastic anemia	2-8.3	600-3800	10000-85000
Multiple myeloma	5.3-5.7	1000-4000	24000-35000

4. Discussion

A total of 79 cases of pancytopenia were studied. Pancytopenia is a common perpherial blood picture finding where red blood cells, white blood cells and platelets are decreased leading to anemia, leucopenia and thrombocytopenia, respectively.It is not a disease but a triad of findings which result from a number of disease processes primarily or secondarily involving the bone marrow.

The present study with a total of 79 patients of pancytopenia was conducted to identify the prevalence of pancytopenia and analyze the clinico-hematological features associated with it.

The prevalence of pancytopenia was more in females (54.43%) than in males (45.56%) in our study. Female preponderance of 54.28% was seen in a similar study by Agarwal et al[5] as was seen in another study by Kumar et al[6].In contrast, Prasad et al[7]and Reddy et al[8] in their study found a slight male preponderance females.

In our study megaloblastic anemia was the most common cause which is in sharp contract to studies undertaken by Khungeret al[12], and Yadav et al[11] in contrast to study undertaken in Nepal by Lakhey A et al[13] showed hypoplastic marrow to bethe most common cause.

The commonest clinical complaint was weakness (80.1%)in our studywhich is similar to the findings observed by Thakkar et al[9]and Niazi et al[10]. (Table 3)

Table 3: Comparison of causes of pancytopenia in various studies

Study	*Year*	*No.of Cases*	*M:F*	*Common Causes*
Khodke K et al[14]	India (2001)	50	1.3:1	Megaloblastic anemia
Tilak V et al[15]	India (1999)	77	1.1:1	Megaloblastic anemia
Jain A et al[16]	India (2013)	250	2.6:1	Hyperspleenism
Kumar et al[6]	India (2012)	48	1:1.8	Hypoplastic marrow
Present study	**India (2018)**	**79**	**1:1.2**	**Megaloblastic anemia**

5. Conclusion

Pancytopenia is most common hematological condition in routine clinical practice. In our study, megaloblastic anemia was the major contributor to cause this condition followed by acute leukemia. Other causes such as dual deficency, multiple myeloma etc were also present. In terms of clinical presentations, the most common was , followed by.

Therefore, the clinical findings and the hematological analysis along with bone marrow aspiration examination are very important for an early diagnosis as most of the causes are treatable and an early intervention can be taken which in return decreases the burden on the patient and enhance the survival rate.

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