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Study on Clinical Profile Of Pancytopenia with Special Reference to Bone Marrow Picture

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Abstract

Pancytopenia is a condition where all the three formed cells, i.e RBC, WBC, PLATLETS, are below the normal reference range. various conditions ranging from simple drug induced bone marrow hypoplasia, megaloblastic marrow to fatal bone marrow aplasia and leukemias presents as pancytopenia. Underlining pathology and severity of pancytopenia determines the management and prognosis. Thus, identification of etiology help in implementing appropriate therapy. To study on clinical profile of pancytopenia with special reference to bone marrow picture. Study was conducted at department of medicine, K R hospital, Mysuru from Jan 2019 to June 2020.Total 35 patients of pancytopenia were studied to determine their clinical features, peripheral smear, bone marrow morphology. Patients explained completely regarding the study and taken consent. etiology was assessed by relevant investigations in respective patients. Commonest age group affected is 31-40 years . Males accounted for 19 cases (54%), females 16 cases (46%). Commonest presenting complaint was easy fatigability followed by bleeding manifestations. Common physical finding was pallor Other signs and symptoms were fever, breath less ness, bone pain, hepatomegaly, splenomegaly, petechial hemorrhages and lymphadenopathy. Megaloblastic anemia is most common cause of pancytopenia followed by hypersplenism, aplastic anemia and malignancies. The physical findings, peripheral blood picture and bone marrow evaluation provides valuable information. From our study it can be proposed that inspite of numerous etiology available for pancytopenia the most common etiology is megaloblastic anemia. and most common reason for megaloblastic anemia is Vit B12 deficiency.

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Key Words

Pancytopenia, complete blood count, megaloblastic anemia, vitB12 deficiency, hypersplenism

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INTRODUCTION

Pancytopenia is a condition in which all the three major formed elements i.e RBC, WBC, PLATLETS, are below the normal reference range[1].spectrum of disorders primarily or secondarily affecting bone marrow may manifest as peripheral pancytopenia[2]. various conditions ranging from simple drug induced bone marrow hypoplasia, megaloblastic marrow to fatal bone marrow aplasia and leukemias presents as pancytopenia[3]. presenting symptom is often attributed to anemia/thrombocytopenia. leukopenia is an uncommon cause of initial presentation but can become the most serious threat to life during the course of disorder[4]. First step in the diagnosis of a disease is assessing the blood elements. Physical examination findings and peripheral blood picture provide important information in the work up of pancytopenic patients and help in planning investigations on bone marrow samples[5]. Bone marrow evaluation is a valuable diagnostic procedure in practice of medicine which may confirm the diagnosis of suspected cytopenia, from the clinical features and peripheral blood examination or occasionally give a previously unsuspected diagnosis6. Different studies shown variations in the etiology of pancytopenia. This variations not only appreciated in different countries but also identified in different regions of a single country. Many studies from north and south India have showed megaloblastic anemia as the most common cause of pancytopenia. The present study has been undertaken to evaluate the various causes of pancytopenia and to evaluate clinical symptoms and signs. Thus it would help in the diagnostic and therapeutic approach in patients with pancytopenia.

MATERIALS AND METHODS

Adult male and female with pancytopenia admitted in KR hospital, in Dept of Medicine and diagnosed on complete haemogram are included in this study. Duration of study was 18 months from Jan 2019 to Jun2020.

Methods of Collection of Data: Patient history and clinical examination will be done by personal interview or collection of medical records as per above mentioned criteria.

After getting written consent from the patient, bone marrow aspiration and trephine biopsy wherever possible will be done by using Salah's needle and Jamshidi needle respectively if needed.

Sample Size: Sample size calculated is 35 with level of confidence as 5% and absolute allowable error as 5% with prevalence of pancytopenia being 2% using confidence interval technique.

Inclusion Criteria: All the cases of pancytopenia with Hemoglobin less than 10gm/dl, White blood cell count less than 4000 cells/cumm and platelet count less than 1,50,000 cells/cumm admitted in K R hospital, Mysuru.

Exclusion Criteria:

- Patients on cytotoxic drugs
- Patients on radiotherapy
- Patients with known case of ITP
- Patients who undergone blood transfusion within 3 months
- Patients taken vitamin supplements within 3 months

The study requires following investigations

- Complete blood count
- Peripheral Smear examination
- Bone Marrow aspiration and biopsy
- LFT
- Abdominal ultrasound
- Blood for Malarial parasite
- HIV
- Chest X ray
- Serological tests for enteric fever
- Special investigation-like ANA profile,vit b12 levels ,folic acid levels
- Ethical clearance was taken from the institutional ethical committee
- Written informed consent was taken from all subjects and their attenders

Data Analysis:

- Appropriate statistical methods will be used to compute frequency tables and proportions.
- Data will be expressed either mean, standard deviation, frequency and percent.
- The chi-square test will be adopted for comparison of the prevalence data.
- Cramers test to found association between rows and coloumns.

RESULTS AND DISCUSSIONS

Total 35 patients of pancytopenia were included in our study .various etiologies of pancytopenia identified by this study population. most common etiology is megaloblastic anemia(48.5%).second most common cause is hypersplenism(14.2%).followed by aplastic anemia (11.4%), malignancies (11.4%), auto immune disorders (5.7%), MDS (2.8%), Myelofibrosis (28%), HIV (2.8%). In this study 54 percent of males and 46 percent of females had pancytopenia.

In this study most common age group is 31-40 which is 25.71% and least common age group is 81-90 which is 2.85%.

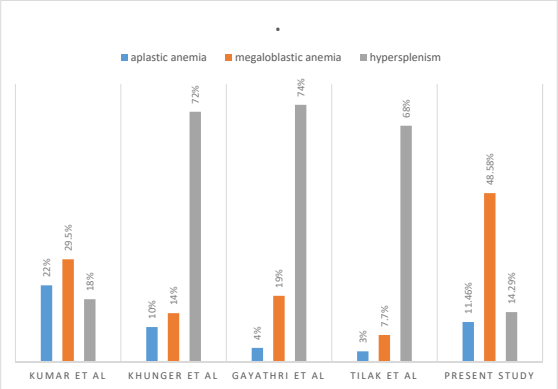

Fig. 1: Comparison of most common causes of pancytopenia with other studies done in India

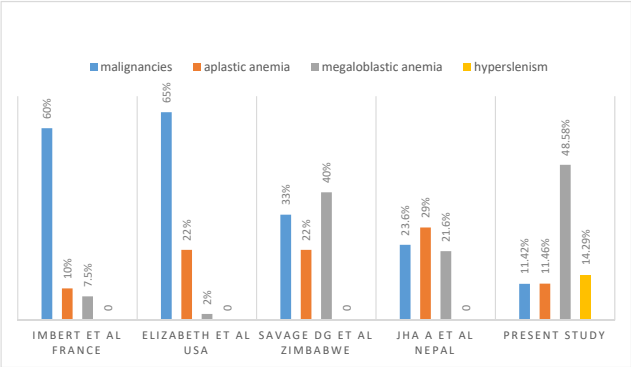

Fig. 2: Comparison of most common causes for pancytopenia done outside India

Table 1: Incidence of pancytopenia in different sex groups

Sex	No. of cases	Percentage
Male	19	54
Female	16	46
Total	35	100

Table 2: Incidence of pancytopenia in different age groups

Age Group	No. of Cases	Percentage
18-30	8	22.85
31-40	9	25.71
41-50	5	14.28
51-60	4	11.42
61-70	5	14.28
71-80	3	8.57
81-90	1	2.85
TOTAL	35	100

Table 3: Presenting complaints in pancytopenia

Presenting Complaints	No. of cases	Percentage
Easy fatigability	33	94.28
fever	12	34.28
palpitation	9	25.71
breathlessness	9	25.71
Gum bleed	9	25.71
melena	6	17.14
menorrhagia	5	14.28
Epistaxis	3	8.57
hematemesis	1	2.85
Bone pain	1	2.85

Table 4: Physical findings in pancytopenia

Physical findings	No. of cases	Percentage
PALLOR	35	100
Spleenomegaly	18	51.42
Hepatomegaly	12	34.28
Petichie/Purpura	9	25.71
Raised JVP	8	22.85
Pedal oedema	8	22.85
Icterus	5	14.28
Bone tenderness	1	2.85

Table 5: Distribution of various causes of pancytopenia

Causes	No. of cases	percentage
Megaloblastic anemia	17	48.58
Hypersplenism	05	14.29
Aplastic anemia	04	11.46
AML	02	5.72
Metastasis	01	2.85
NHL	01	2.85
Sjogrens syndrome	01	2.85
SLE	01	2.85
HIV	01	2.85
MDS	01	2.85
Myelofibrosis	01	2.85
Total	35	1OO

Table 6: Comparison of age groups in others and current study

Authors	Age distribution (in years)
Kumar *et al.*[1]	12-73
Tilak *et al.*[1]	5-70
Gayathri *et al.*[1]	2-80
Khunger *et al.*[1]	2-70
Khodke *et al.*[1]	3-69
Jha A *et al.*[1]	1-79
Savage DG *et al.*[1]	1-80
Present study	19-81

Table 7: Comparison of no of cases with different studies

Authors	No. of cases
Kumar *et al.*[3]	166
Tilak *et al.*[5]	77
Khodke *et al.*[7]	50
Savage DG *et al.*[8]	134
Present study	35

Table 8: comparison of male to female ratio with other studies.

Author	Male : female ratio
Kumar *et al.*[3]	2.1:1
Tilak *et al.*[5]	1.14:1
Khodke *et al.*[7]	1.3:1
Savage DG *et al.*[8]	1.3:1
Present study	1.18:1

Table 9: Clinical features compared with other studies

Clinical features	Tilak *et al.*[5]	Khodke *et al.*[7]	Present study
Easy fatigability	77	30	33
Fever	-	20	12
Breathlessness	-	-	9
Bleeding	-	10	24
Bone pain	2	-	1

Table 10: physical findings compared with other studies.

Physical findings	Tilak *et al.*[5]	Khodke *et al.*[7]	Present study
Pallor	77	50	35
Hepatomegaly	34	19	12
splenomegaly	39	20	18

In this study most common presenting symptom is easy fatigability which is present in 94.28 subjects. least common presentation is hematemesis and bone pain which is about 2.85% each. Other important presenting symptoms include fever (34.28%), palpitation (25.71%), breatlesness (25.71%), gum bleed (25.71%), malena (17.14%), menoragia (14.28%), epistaxis (8.57%).

In this study most common physical finding is pallor which is noted in 100% subjects and least common is bone tenderness (2.85%).

In our study most common cause of pancytopenia is megaloblastic anemia(48.58%).

All statistical data regarding age, sex, symptoms signs, peripheral smear, bone marrow examination and causes of pancytopenia were studied and compared with those published in previous literatures.

In our study lowest age is 19 years and highest age is 81 years.

The male to female ratio in most patients show male predominance in almost all studies. In our study male to female ratio is 1.18:1.

In present study most common presenting symptom was easy fatigability. This is similar to studies of tilak *et al*, khodke *et al*, where the most common presenting symptom was easy fatigablity.

Fever is present in 34.28% cases in this study, it was 70% in Yadav *et al.*

Pallor is the most common physical finding in our study which is present in 100% cases,which is true with the other studies like tilak *et al.*[5], khodke *et al.*[7] where also the most common physical finding is pallor. Hepatomegaly is 34.28% in present study while it was 28.9% in Yadav *et al*, 32.5% in khunger *et al*. It was higher in khodke *et al.* [1] with 38% and 44.1% in tilak *et al.*[1].

Splenomegaly is 51.4% in present study as compared to 25.5% in Yadav *et al.*[1] ,40% in klhodke *et al.*[7],32.5% in khunger *et al.*[1] and 50,6 % in tilak *et al.*[5].

Figure shows present study compare with other Indian studies. tilak *et al.*[5] shows most common cause for pancytopenia was hypersplenism, followed by megaloblastic anemia. kumar *et al.* study shows most common cause was megaloblastic anemia. present study shows most common cause is megaloblastic anemia followed by hypersplenism.

The figure shows the most common causes of pancytopenia with the present study with the studies done outside the India. imbert et al and Elizabeth et al clearly shows the most common cause for pancytopenia is malignancies. savage DG et al8 study done in Zimbabwe shows most common cause is megaloblastic anemia. jha *et al.* the study done in Nepal shows the most common cause for pancytopenia is aplastic anemia followed by megaloblastic anemia. In present study most common cause for pancytopenia is megaloblastic anemia followed by hypersplenism.

CONCLUSION

Pancytopenia is a frequently encountered hematological problem in clinical practice .if a patient presents with unexplained anemia, prolonged fever and tendency to bleed then pancytopenia should be suspected and laboratory evaluation must be carried out. The physical findings ,pheripheral blood picture and bone marrow evaluation provides valuable information. The peripheral blood film examination helps in evaluating the most common probable cause of anemia while bone marrow examination is diagnostic. Bone marrow examination is accurate, reproducible, rapidly available information at an economical cost and with minimal discomfort to the patient. From our study it can be proposed that inspite of numerous etiology available for pancytopenia the most common etiology is megaloblastic anemia. and most common reason for megaloblastic anemia is vit B12 deficiency .so it can be suggested that screening of B12 deficiency should be initial screening test for evaluation of megaloblastic anemia irrespective of diet of patient. other investigations like UGI endoscopy can be followed through if needed based on clinical scenario .other conditions like hypersplenism, aplastic anemia, malignancy which are the next common causes in our study should be kept in mind while ordering for further investigations.

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