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Clinico- Hematological Study of Pancytopenia

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I. Introduction

Pancytopenia is a triad ofanaemia, leukopenia and thrombocytopenia.The presenting symptoms such as pallor, dyspnea, bleeding and bruising are usually due to anemia and thrombocytopenia. Pancytopenia in a patient with associated organomegaly and lymphadenopathy usually suggest the possibility of malignancies or bone marrow failure syndrome.[1] Peak incidence between ages 15 to 25 and 65 to 69.[2] The causes of pancytopenia being quite varied result in diagnostic dilemma. Cytotoxic therapies, including myeloablative radiation therapy and chemotherapy, are common and predictable causes of pancytopenia in patients being treated for malignancies; pancytopenia outside this setting can be very challenging. Evaluation of patient begins with exhaustive history including but not limited to drug intake, exposure to toxins, family history and febrile illness; followed by meticulous physical examination and detailed investigations including bone marrow evaluation in most cases. All the cases of pancytopenia require a thorough approach to find out the cause. There are no universally accepted guidelines for the management of pancytopenia. The treatment depends upon the underlying etiology. The main goal is to provide supportive care including broad spectrum antibiotics along with blood and blood components especially in patients with fever and bleeding till they receive treatment for the basic disease-causing pancytopenia.[3,4]

II. Material And Methods

A study of 500 cases of patients presenting with pancytopenia was conducted at V. S. GENERAL HOSPITAL, SMT.NHL MUNICIPAL MEDICAL COLLEGE, AHMEDABAD**.** This is an observational study over a period of one year. 500 patients admitted to the hospital were selected using purposive sampling techniques. Complete blood count and platelet count were done by automated analyzer and peripheral blood films were prepared and stained by Field's stain. If platelet count is <1,50,000 /µl and negative for Malarial parasite then further investigations likes dengue, chikungunya, hepatitis, Leptospirosis, Blood culture were done. Chest X ray, HIV, Monospot for Infectious mononucleosis, Bone marrow study and other specific investigations were done only if required. If diagnosed with a specific disease, subsequent investigation were not done. Based on the outcome and complications other tests were also repeated.

SAMPLE SIZE: 500 cases
STUDY DESIGN: Observational study
SAMPLE DESIGN: Purposive sampling
STUDY DURATION: one year

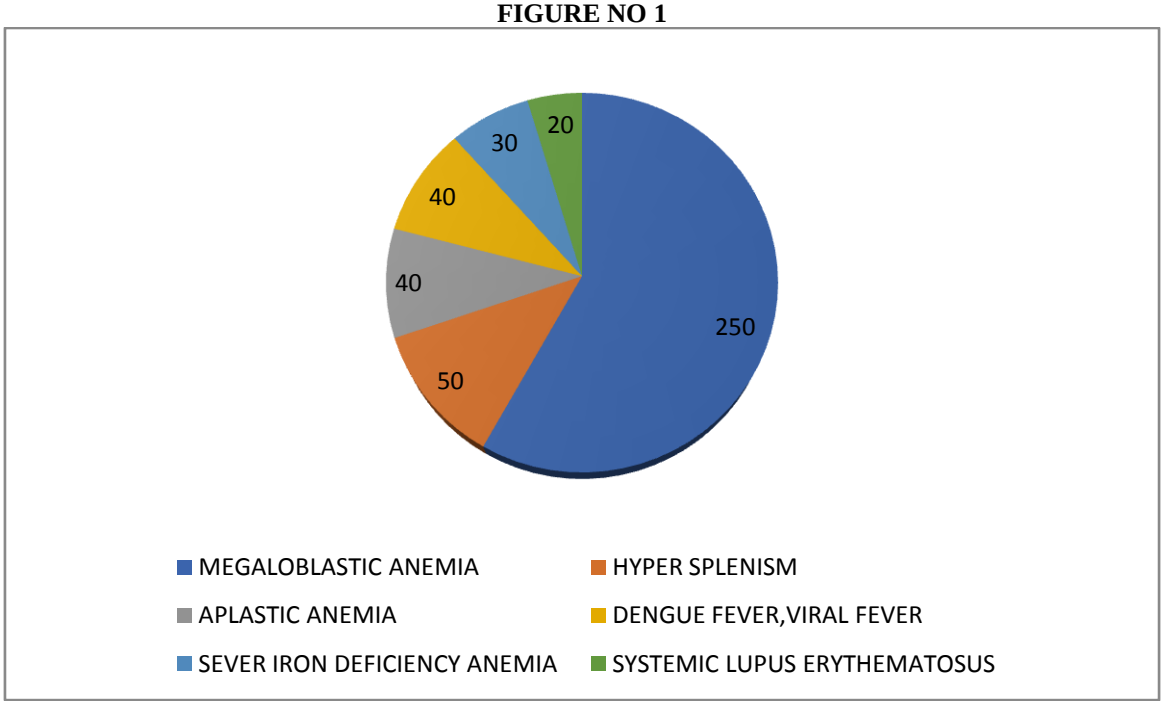
CRITERIA:

- Both sexes, age of 18yrs and above.
- Hemoglobin<10g/dl.
- Leucocyte count <4000/cu.mm.
- Platelet count <100000/cu.mm
- The study will be carried out on patients admitted in V.S.G.H (medical ward, IMCU, MICU) in pancytopenia patients

III. Results:

The total population was 500[n]. Most common etiology is megaloblastic anaemia accounting for 50%. Second most common causes washematological malignancies accounted for 10%. Followed by hypersplenism 10%, aplastic anaemia 8%, dengue-fever with pre-existing iron deficiency anaemia 8%, severe iron deficiency anemia-6%, systemic lupus erythematosus 4%, hemophagocytic lympho-histiocytosis 4% In the megaloblastic anaemia combined vitamin B12 & folate deficiency [60.0%] followed by isolated vitamin B12 deficiency [36.0%]. Isolated folate deficiency - 8%

FIGURE NO 1



Age wise distribution in pancytopenia patients, more common age group fall under 41-50yrs & 61-70yrs. The mean of various laboratory parameters are considered below in following table. Represents the mean, standard deviation, range of various parameters, hemoglobin, WBC, platelets, MCV, RDW, MPV [minimum to maximum].

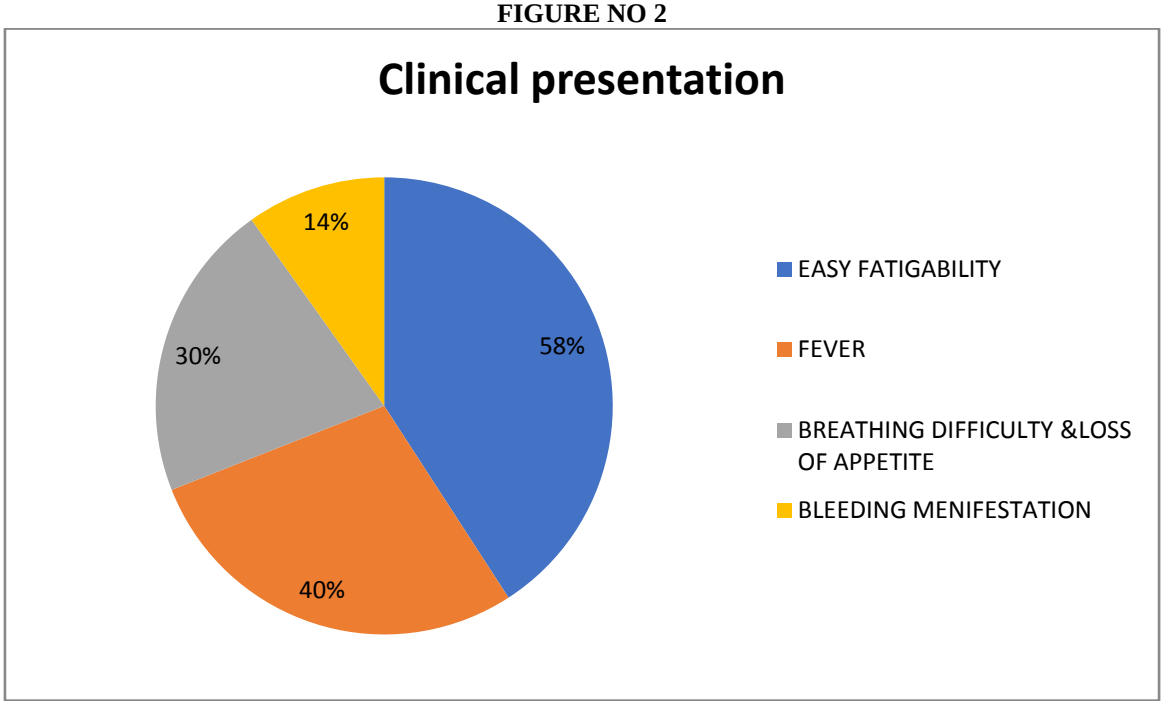
Mean total WBC – 2.54±0.99
Mean hemoglobin – 5.8±2.1
Mean platelet – 49.12±31.75

TABLE NO 1

	MINIMUM	MAXIMUM	MEAN	STD.DEVIATION
HB	2.00	10.00	5.8140	2.10994
WBC	0.40	3.90	2.5420	0.99757
PLATELET	3.00	99.00	49.1200	31.75650
MCV	54.00	133.00	93.6980	20.22669
RDW	17.10	42.00	28.4083	8.09788
MPV	8.00	11.60	9.3417	0.99909

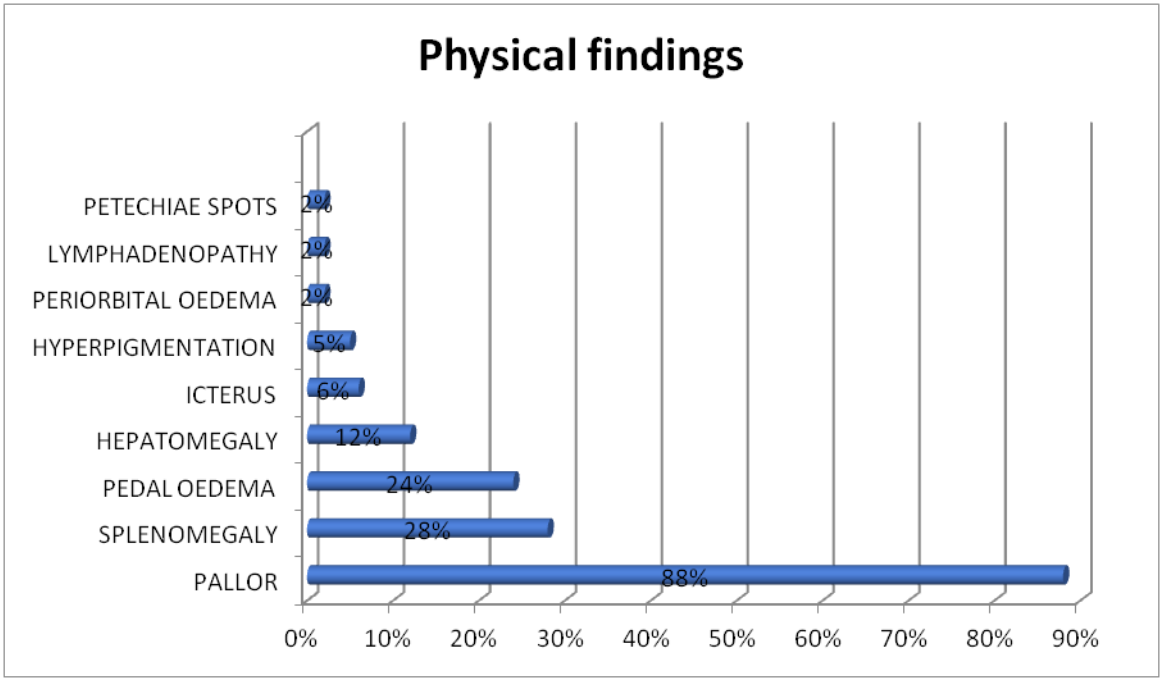
The most common presenting complaints of patients presenting with pancytopenia was easy fatigability 58%, fever – 40%, breathing difficulty & loss of appetite – 30%.Bleeding manifestation was the presenting complaint in only 14%.

FIGURE NO 2



PHYSICAL EXAMINATION– most common physical finding in our study group; pallor 88%, splenomegaly 28%, pedal oedema 24%.

FIGURE NO 3



PERIPHERAL SMEAR FINDINGS:

TABLE NO 2

CAUSES	NO Of patients	A	B	C	D	E	F	G
Megaloblastic anemia	250	240	30	150	30	50	0	0
Hypersplenism	50	50	0	0	0	0	0	0

Aplastic anemia	40	30	0	10	10	0	0	0
Dengue fever with pre- existing iron deficiency anemia	40	20	0	0	20	10	0	0
Severe iron deficiency anemia	30	10	0	0	10	10	0	0
Systemic lupus erythematous	20	20	10	0	0	10	0	0
Plasma cell dyscrasis	20	20	10	10	10	0	0	0
Myelodysplastic syndrome	20	10	0	0	0	0	0	0
Hemophagocytic lymphohistiocytosis	20	0	10	0	0	0	0	0
Acute myeloid leukemia	10	20	0	0	10	0	0	0
Total	**500**	**430**	**60**	**170**	**90**	**80**	**0**	**0**

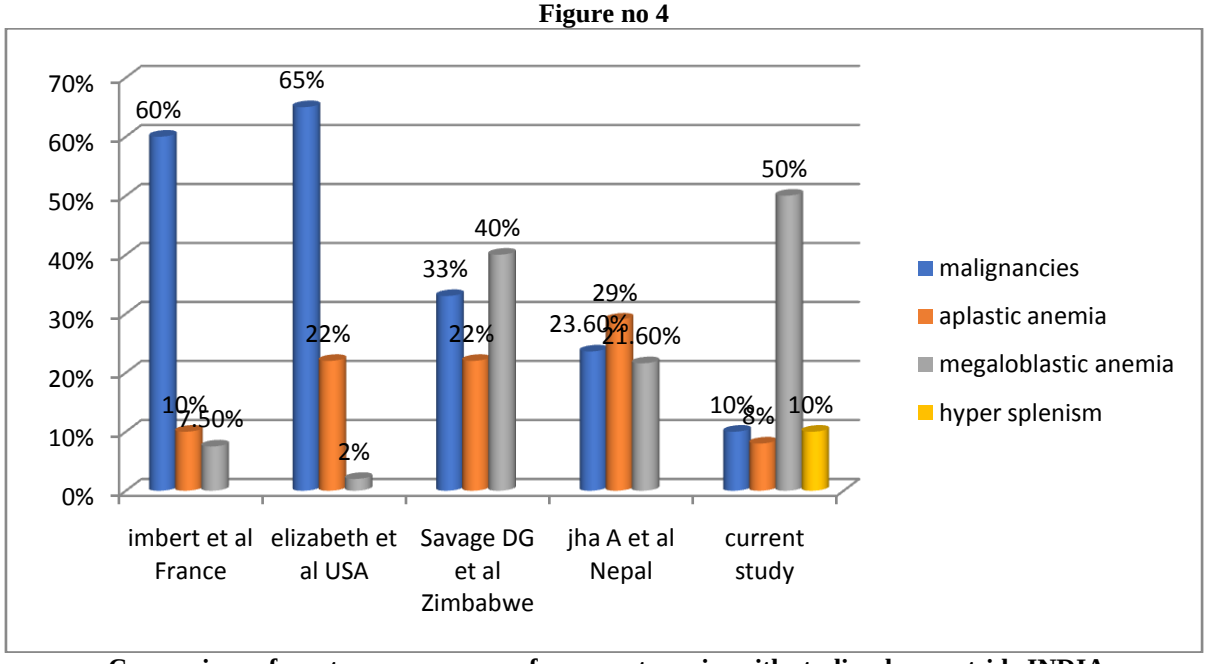
A-ANISOPOIKILOCYTOSIS	B-IMMATURE WBC
C-HYPERSEGMENTED NEUTROPHILS	D-ACTIVATED LYMPHOCYTES
E-LYMPHOCYTOSIS	F- IMMATURE RBC
G-INCREASED RETIC	

BONE MARROW finding in our study is hypercellular marrow [80.0%] followed by normocellular marrow [17.5%]. Out of 500 patients, 100 patient bone marrow aspiration and biopsy was not done

IV. Discussion

The most common causes of pancytopenia in various studies outside India are represented in the following figure no 4. A study done by Imert et al & Elizabeth[5] et al shows the most common cause for pancytopenia is malignancies. A study done by Savage dg et al[6] in Zimbabwe which shows the most common cause of pancytopenia as megaloblasticanaemia. A study done in Nepal by jha a et al[7] shows the most common cause is aplastic anaemia followed by megaloblastic anaemia. In our study the most common cause for pancytopenia was megaloblastic anaemia followed by malignancies and hypersplenism.

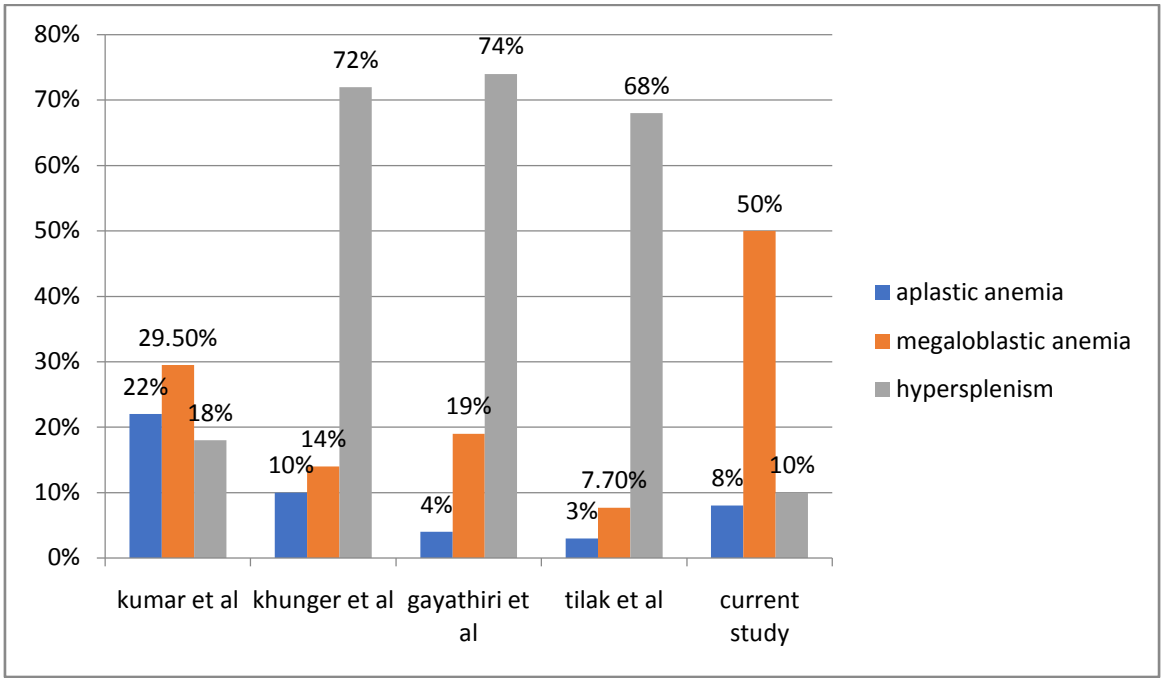
Figure no 4



Comparison of most common causes for pancytopenia with studies done outside INDIA

The figure5 shows current study compare with other Indian studies. Khunger et al[8], Gayathiri et al[9], Tilak et al shows most common cause for pancytopenia was hypersplenism, followed by megaloblastic anaemia. Kumar et al[10] study shows common cause was megaloblastic anaemia. Current study shows most common cause is megaloblastic anaemia followed by hypersplenism.

FIGURE NO 5



Comparison of most common causes for pancytopenia with studies done in INDIA

V. Conclusion

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 vitamin b12 deficiency. So, it can be suggested that screening of b12 deficiency should be the intial screening test for evaluation of megaloblastic anaemia irrespective of the diet of the patient because it is not only the most common cause of megaloblastic anemia but is also present in patients who consume mixed diet. Other conditions like aplastic anaemia, hypersplenism and malignancy which are the next most common cause in our study should also be kept in mind while ordering further investigations.

The findings of the above study also indicates that prompt identification of patients with megaloblastic anemia and treating the underlying cause in intial stage itself can reduce the incidence of pancytopenia and its various complication.

Limitations

1. This study was conducted in particular region & most of the study population were natives of the same location, hence the race and regional variability cannot be comment upon
2. Few of the patients in this study denied bone marrow biopsy and UGI scopy hence, those finding not included in this study
3. Few of these patients were not followed through due poor patient compliance hence, response to therapy were not looked into in detailed.

References:

[1]. McPherson RA, Pincus MR. Henry's Clinical Diagnosis and Management byLaboratory Methods E-Book. Elsevier Health Sciences; 2017 Apr 5.
[2]. de Gruchy GC: Pancytopenia, aplastic anemia. De Gruchy's clinical hematology in medical practice, 5th edition. In: Firkin F, Chesterman C,Penington D, Rush B (Eds). Berlin, Germany: Blackwell Science, 1989;119-36.
[3]. Naseem S, Verma N, Das R, Ahluwalia J,Sachdeva MS, Marwaha RM. Pediatric patients with bicytopenia/pancytopenia: Review of etiologies and clinico-hematological profile at atertiary care center. IndianJournal of Pathologyand Microbiology.2011;54(1):7580
[4]. Camitta BM, Storb R, Thomas ED. Aplastic anemia: pathogenesis, diagnosis, treatment andprognosis.NEngl JMed1982; 306(11): 645-52
[5]. Weinzierl EP, Arber DA. Bone marrow evaluation in new-onset pancytopenia. Hum Pathol. 2013 Jun;44(6):1154-64. doi: 10.1016/j.humpath.2012.10.006. Epub 2013 Jan 17. PMID: 23332933.
[6]. Savage DG, Allen RH, Gangaidzo IT, Levy LM, Gwanzura C, Moyo A, Mudenge B, Kiire C, Mukiibi J, Stabler SP, Lindenbaum J. Pancytopenia in Zimbabwe. Am J Med Sci. 1999 Jan;317(1):22-32. doi: 10.1097/00000441-199901000-00004. PMID: 9892268.
[7]. Sweta, Barik S, Chandoke RK, Verma AK. A prospective clinico-hematological study in 100 cases of pancytopenia in capital city of India. J Appl Hematol2014;5:45-50
[8]. Khunger, Jitender & Subramanian, Arulselvi& Sharma, Utsav & Ranga, Sunil & Talib, V. (2002). Pancytopenia – A clinicohaematological study of 200 cases. Indian journal of pathology & microbiology. 45. 375-9.
[9]. Gayathri, B & Rao, Kadam. (2011). Pancytopenia: A Clinico Hematological Study. Journal of laboratory physicians. 3. 15-20. 10.4103/0974-2727.78555.
[10]. Ajai Kumar Garg. Pancytopenia-clinical approach chapter95-APIINDIA,2017print