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Assessment of peripheral blood film findings among anemia patients

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Abstract
Background: Peripheral blood examination has been a window for hematological ongoings since decades. The present study was conducted to assess peripheral blood film findings among anemia patients.
Materials & Methods: 50 patients of both genders were included. 5 ml blood samples were collected from the peripheral veins in an anticoagulant vial in the right proportion. Peripheral blood smear slides of anemia were studied for the morphological abnormalities in the red blood cells associated with different types of anemia and the findings were noted down.
Results: Out of 50 patients, age group 20-40 years had 14, 40-60 years had 12 and 60-80 years had 24 patients. Type of anemia on peripheral blood smear found to be microcytic hypochromic in 65%, normocytic normochromic in 25%, macrocytic normochromic in 5% and hemolytic anemia in 5%. The difference was significant (P<0.05).
Conclusion: The most common anemia on peripheral blood smear was microcytic hypochromic anemia.

Keywords: anemia, normocytic normochromic, peripheral blood

Introduction
Peripheral blood examination has been a window for hematological ongoings since decades [1]. Analyzing blood films routinely has facilitated interpretation of various hematological disorders and has been a major diagnostic tool especially for etiopathological work up of anemias [2]. Peripheral blood film (PBF) is a basic and a highly informative haematological tool at the clinician's disposal in screening, diagnosis and monitoring of disease progression and therapeutic response. An adept understanding of peripheral blood interpretation is important for a successful clinical practice. The diagnostic relevance of a PBF is enormous [3]. The PBF exposes the morphology of peripheral blood cells, which ensures its place in the morphologic diagnosis of various primary and secondary blood and blood related diseases [4]. It's diagnostic relevance has not been lessened by advances in haematology automation and molecular techniques [5].
The most common cause of anemia is nutritional deficiency of iron, vitamin B12 or folic acid. But many clinical conditions can also lead to anemia like decreased production of RBCs in disease causing bone marrow failure and increased destruction of RBCs in clinical conditions leading to hemolysis. Anemia also could be multifactorial in origin [6]. So, every patient of anemia should be investigated to find out the cause and the type for proper medical treatment [7]. The present study was conducted to assess peripheral blood film findings among anemia patients.

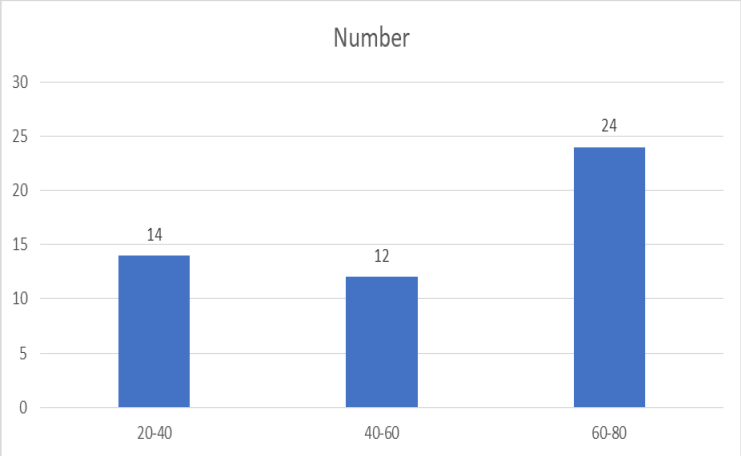
Materials & Methods
The present study comprised of 50 patients of both genders. All were informed regarding the study and their written consent was obtained.
Data such as name, age, gender etc. was recorded. 5 ml blood samples were collected from the peripheral veins in an anticoagulant vial in the right proportion. Ethylene diamine tetra-acetic Acid (EDTA) was the anticoagulant used. Peripheral blood smear slides of anemia were studied for the morphological abnormalities in the red blood cells associated with different types of anemia and the findings were noted down. Results thus obtained were subjected to statistical analysis. P value less than 0.05 was considered significant.

Results

Table 1: Distribution of patients

Age group	Number	P value
20-40	14	0.05
40-60	12	
60-80	24	

Table 1, graph 1 shows that out of 50 patients, age group 20-40 years had 14, 40-60 years had 12 and 60-80 years had 24 patients. The difference was significant (P<0.05).

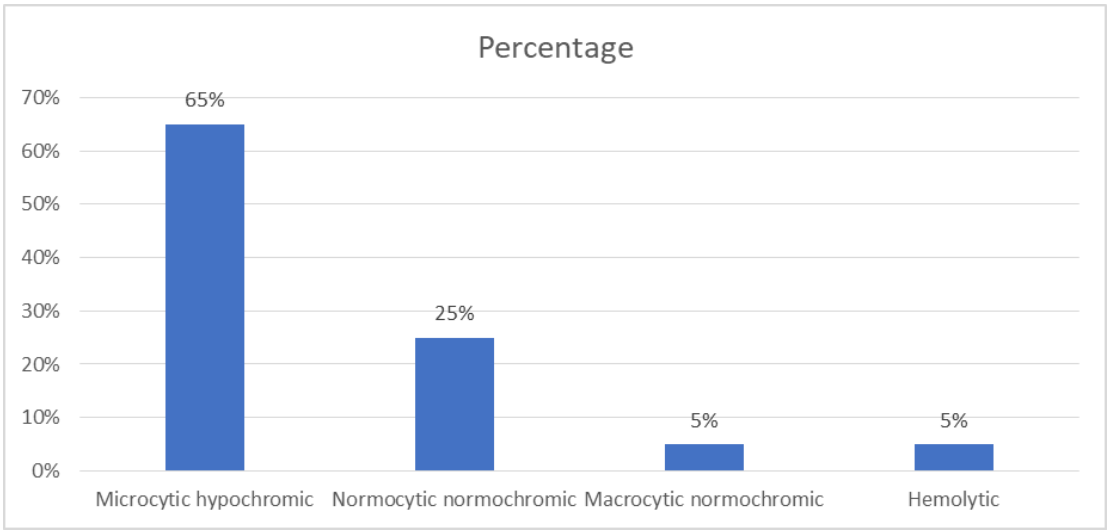


Graph 1: Distribution of patients

Table 2: Type of anemia on peripheral blood smear

Type of anemia	Percentage	P value
Microcytichy pochromic	65%	0.01
Normocytic normochromic	25%	
Macrocytic normochromic	5%	
Hemolytic	5%	

Table 2, graph 2 shows that type of anemia on peripheral blood smear found to be microcytic hypochromic in 65%, normocytic normochromic in 25%, macrocytic normochromic in 5% and hemolytic anemia in 5%. The difference was significant (P<0.05).



Graph 2: Type of anemia on peripheral blood smear

Discussion

The commonest laboratory test for diagnosis of anemia is hemoglobin estimation [8]. In clinical practice, anemia is diagnosed by reduced hemoglobin concentration of the blood below the normal range and reduced hematocrit level (the ratio of packed red cells to total blood volume) [9].

Peripheral blood smear (PBS) examination is a cheap and quick method for categorizing different types of anemias by studying the RBCs morphology [10]. Smear examination can also identify abnormal, atypical WBCs, any abnormality in platelets and can give an assumption of total WBCs count and platelet counts [11]. Peripheral blood smear examination in addition with complete blood count (CBC) by the automated hematology analyzers can provide a more accurate report on categorizing different types of anemia. Smear examination also helps in cross checking the results of RBCs indices generated by the analyser [12]. The present study was conducted to assess peripheral blood film findings

among anemia patients.

In present study, out of 50 patients, age group 20-40 years had 14, 40-60 years had 12 and 60-80 years had 24 patients. Singh *et al.* [13] evaluated RBC morphology on peripheral blood smear examination in patients of anemia and to compare these findings with cell counter generated red blood cells indices comprising of Mean Corpuscular Volume (MCV), Mean Corpuscular Hemoglobin Concentration (MCHC) and Mean Corpuscular Hemoglobin (MCH). Red blood cell morphology on peripheral blood smear was studied in 350 patients of anemia Most common anemia seen on smear examination was microcytic hypochromic anemia which accounted for 210 (60%) cases followed by dimorphic anemia in 73 (20.86%) cases. Most of the patients were female, comprising of 227 (64.85%) cases. Highest numbers of patients were in the age group of 21-30 years (20.30%). Sensitivity of MCV, MCHC and MCH was 78%, 14% and 80% respectively in detection of microcytic hypochromic anemia. The sensitivity of MCV and MCH was found to be 100% in detection of macrocytic anemia. Sensitivity of MCHC was only 10% for detection of macrocytic anemia. The sensitivity of MCV, MCHC and MCH was 78%, 100% and 67% respectively in detection of normocytic normochromic anemia.

We found that type of anemia on peripheral blood smear found to be microcytic hypochromic in 65%, normocytic normochromic in 25%, macrocytic normochromic in 5% and hemolytic anemia in 5%. Kumar *et al.* [14] in 60 anemic patients, automated counts and peripheral blood smear were prepared and evaluated by three observers, according to a red cell morphology grading guide. Objective grading of peripheral blood smears in cases of anemia have a good inter observer correlate on and hence have reduced subjective variation. Manual parameters like microcytosis, macrocytosis and hypochromia expressed as a percentage, have shown significant correlation, with their corresponding automated parameters, and the regression model so generated may provide a novel way for quality control of automated counters, if calculated for different models.

Conclusion

Authors found that the most common anemia on peripheral blood smear was microcytic hypochromic anemia.

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