Hematological cells morphological parameter on peripheral blood smear – hematological finding HIV

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ABSTRACT
Identify the red cells morphological changes (Peripheral blood smear) due to altered haematopoiesis resulting from HIV infection and the pathogenesis of red cells morphological changes in human immunodeficiency virus (HIV). Blood was collected in a sterile EDTA containing tube and processed following our established laboratory protocol and by universal precaution as per the guideline of National AIDS control organization (NACO, India). A complete blood counting including Hb%, PCV, Red cell indices, platelet count and total white cell count and differential was done by Automated blood cell counter analyzer of all the patient on antiretroviral therapy. The all cell count indices including WBC count with differential and platelet count, was further confirmed by manual oil immersion smear study method. Peripheral smears study was done with field A and B Stain and Leishman stain. Red blood cell changes including anisocytosis, poikilocytosis, Rouleaux formation increase background staining and Occasional features of microangiopathic haemolytic anaemia (schistocyte, large helmet cell) are seen. Anisocytosis and poikilocytosis both are the most common finding in our study because HIV virus alters the homeostasis of erythropoiesis, HIV infection increase immuno-globalin protein and interfere with charge of RBC and thus increase background staining of smear.

Keywords: NIL.

INTRODUCTION
Peripheral blood neutrophils are showed striking dysplastic features which included detached nuclear fragments, acquired Pelger-Huet anomaly chromatin clumping, neutrophils with strangely shaped nuclei, and a high nucleocytoplasmic ratio and macrocytocytes. Dysplastic changes in neutrophils are common in patients with AIDS and can be the feature that suggests the possibility of HIV infection. The presence of detached nuclear fragments in neutrophils is particularly suggestive. The range of changes seen differ from those that are usual in myelodysplastic syndromes. Hypo- and hypergranularity is less common whereas bizarrely shaped nuclei and a high nucleocytoplasmic ratio in mature cells are more common. But they are quite uncommon whereas they are characteristic of HIV infection. Typically left-shifted and may exhibit a number of morphologic abnormalities, including enlarged size, hyposegmentation, and Pelger-Huet anomalies. Atypical plasmacytoid lymphocytes are occasionally seen in asymptomatic individuals but are particularly common in lymphopenic patients with AIDS and during acute HIV infection. Large atypical monocytes have also been described with prominent vacuolization and fine nuclear chromatin.

Material & Methods
Study area and design- This present study was conducted at the advanced institute of medical sciences and research Bhopal and associated referral hospital Bhopal mp. The study was designed as an observational retrograde with prospective hospital based study over a period of time from 2016 to 2017 years.
Anisocytosis with poikilocytosis is most common morphological changes of red blood cell in HIV positive cases.

Discussion
Red Blood Cells changes-Anisocytosis
Poikilocytosis Rouleux formation .Increase background staining and Occasionally the blood film shows features of microangiopathic haemolytic anaemia In our study 157 cases (37.00%, n=100) shows normocytic normochromic anaemia in which male are 65 cases (65%, n=100) and female are 35 cases (35.00%, n=100) while that cases (42.66%, n=100) shows anisocytosis. There are total 78 cases (26%, n=100), in which 43 cases (22.87%, n=100) of male and 35 cases (31.35%, n=100) of female showed microcytosis. In our study 50 cases (16.66%, n=100) shows microcytosis. In which 19 cases (16.97%, n=100) of male and 31 cases (16.48%, n=100) are male.In our study 259 cases (86.33%, n=100) shows poikilocytosis in which 166 cases (88.29%, n=100) of male affected and 93 cases (83.03%, n=100) of female. In our study 26 cases (8.66%, n=100) also shows Rouleux formation in which 16 cases (8.51%, n=188) of male affected and 10 cases (8.92%, n=100) are of female.In our study 7 cases (2.33%, n=100) also shows increased background staining in which 5 cases (2.65%, n=100) are of male affected and 2 cases (1.78%, n=100) of female. In our study least common haematological finding on peripheral smear is schistocyte, only 5 cases (1.66%, n=100) show this finding . In which 1 case (0.5%, n=100) is of male and 4 cases (3.57%, n=100) of female. Similar findings were also noticed by Barbara J. Bain et al. RBC changes include anisocytosis, poikilocytosis, Rouleux formation increase background staining and occasionally the blood film shows features of microangiopathic haemolytic anaemia (schistocyte, large helmet cell).the Upton’s "N-1"chi-sq.x2 value=2.980, P=0.084 and Pearson’s chi-square x2 value = 2.998 P = 0.083.

Data analysis in following hematological parameters with the difference of sex distribution under the Extended Mantel-Haenszel test for trend of chi - Squares test.Chi-sq. test X2 Value = 1.388 [DF = 1] 2-sided P = 0.239

For trend in a given direction: P value = 0.119

Conclusion

In our study of 100 cases, where 65 are males while 35(35.00%, n=100) are females .highest prevalence of hematological manifestation of HIV positive patient i.e. 44% is found between 31-40 years of age. Anisocytosis with poikilocytosis is most common morphological changes of red blood cell in HIV positive cases.Out of 100 study cases normocytic normochromic anaemia is the most common type of anaemia, among both male and female.In our study, 100 cases (76.59%) of male show this type anaemia .Normocytic normochromic anaemia along with Poikilocytosis is the most common peripheral smear change in red blood cells and presence of schistocyte is least common change in the peripheral smear.Out of 100 study cases of female normocytic normochromic anaemia is the most common type of anaemia, with 51.78% cases. Overall Normocytic normochromic anaemia along with Poikilocytosis is the most common peripheral smear change in red blood cells and presence of schistocyte is least common change in peripheral smear in hiv infection.

Reference:
1. Ajay Wanchu et al. in the “profile of hematological abnormality of Indian HIV infected individual” in PGI Chandigarh over a period of 2 years from 2007-09 India when sample size n=200. In this study also show anaemia [1][2][3]is most common hematological finding in HIV positive cases. (BMC blood disorders 2009, 9:5 doi:10-1186/1417-2325-9-5
5. Daniel Nii Aryee Tagoe et al in a case control study of ” profiling hematological changes in HIV patient attending fevers clinic at the central regional hospital in Cape Coast Ghana , over a six month period when sample size n=150
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