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Acquired Pelger-Huet Anomaly and Altered morphology of neutrophils-in vivo Cytotoxicity in patients of sickle cell anaemia treated with hydroxyurea

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Abstract

Objectives & AIMS: The evaluation and identify new prognostic markers suggested in recent studies. Evaluate the relationship between morphological changes in neutrophils and sickle cell anaemia treated with hydroxyurea . mortality morbidity after the initial of dimorphisms changes in neutrophils . Increased and decrease nuclear lobulation in neutrophils as a prognostic value associated with adverse outcomes. We studied the association between pelger huet anomaly during hospital course with hydroxyl urea outcomes survival index of patients. Identify the haematological manifestations (Peripheral smear) of altered haematopoiesis resulting from cytotoxicity of dna damage due to hydroxyl urea .Review the pathogenesis of the haematological manifestations of hydroxylurea.

Material & Methods: Blood was collected in a sterile EDTA containing tube and processed following our established iso certified hospital based laboratory protocol .A complete blood counting including HB%,PCV, Red cell indices ,platelet count, total white cell count done by Automated blood cell counter. The all cell count indices including RBC, WBC count with differential along with morphological changes further confirmed by manual oil immersion smear study method. Peripheral smears study was done with field A and B stain and leishman stain.

Conclusion: This study demonstrates sickle cell anaemia treated with hydroxyurea . mortality morbidity after the initial of dimorphisms changes .This is a cytotoxic effect on the neutrophils of patients with sickle cell anaemia, and Hydroxy urea may even be able to promote a protective effect on these cells, however there is the risk of DNA damage associated with exposure for longer periods of time. The monitoring of patients with sickle cell anaemia is important, since the data on the cytotoxic effective is conclusive.

Keyword: Hydroxy urea ,sickle cell anaemia

Material & Methods

Study area and design- This present study was conducted at the *CNBC hospital is a part of MGM Medical college with M.Y.Hospital Indore MP*. The study was designed as a observational retrograde with prospective hospital based study over a period of time from 2016 to 2018 years.

Ethical consideration- Blood was collected in a sterile EDTA tube and plaint tube and processed following our established laboratory protocol then generate the report of each patient. Take informed consent was obtained from all study participant for use of your blood sample for medical research after doing physician request investigating and generate the report.

Patient's selection criteria-The study target all patients

on the basis of clinical signs ,symptoms and , history by attainder. We include both emergency and IPD patients with all groups, male and female both gender for study. Sample size is 100 patients.

Laboratory investigations Blood was collected in a sterile EDTA containing tube and processed following our established laboratory protocol .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 and peripheral blood smear examination . The all cell count indices including RBC, WBC count with differential along with morphological changes further confirmed by manual oil immersion smear study method. Peripheral smears study was done with field A and B stain and leishman stain.

Materials:

Purple vacutainer tube or capillary collector (EDTA) ethylenediaminetetraacetate,Slides and blue capillary tube,Needle or lancet,Vacutainer holder,Alcohol swab,Cotton balls,Absorbent materials,Slide case and heamatological cell counter.

Procedure:

Specimen is collected into EDTA (purple) vacutainer. (5 or 7ml volume) 2]

Laboratory investigations- Blood was collected in a sterile EDTA containing tube and processed following our established laboratory protocol

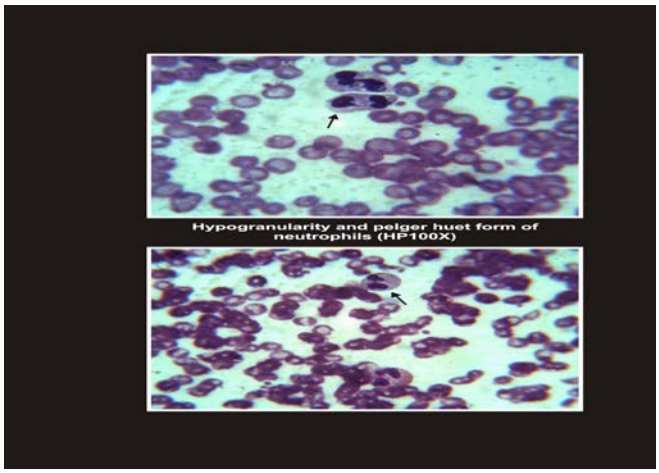
A complete blood counting including HB%,PCV, Red cell indices ,platelet count and total white cell count and differential was done by Automated blood cell counter analyzer of all the patient on antiretroviral therapy .The all cell count indices including WBC count with differential and platelet count, was further confirmed by manual oil immersion smear study method. Peripheral smears study was done with field A and B stain and leishman stain.

Hematological examination-

Hematological examination including HB%, PCV, Red cell indices, platelet count and total white cell count with differential count should be done on peripheral smears stained with field A and B stain and leishman stain.

Observation & Discussion

Morphology of neutrophils	Prognosis	Survival outcome of patients	Sample size N=100
Pelger Huet anomaly	Mild	Good	72
Unilobular	Moderate	Average	30
Hypersegmentation	Sever	Poor	06
Dismorphism	Marked	Worst	02



Hydroxy urea inhibits the enzyme ribonucleotide reductase (RNR), causes cell-cycle arrest, and allows globin genes to be more actively expressed. By killing cycling cells, HU changes the kinetics of erythroid proliferation, forcing more F cells to be produced from primitive progenitors .Furthermore, HU therapy increases haemoglobin concentration, reduces the expression of adhesion molecules on erythrocytes, platelets and neutrophils, decreases the production of granulocytes and

contributes to the improvement of clinical events, reducing the number of hospital admissions,

Result: Univariate analysis showed that there were significant associations of morphological changes in neutrophils in sickle cell anaemia treated with hydroxyurea , mild to marked type changes these various morphological changes cause the raised distribution morphology use as a prognostic tool for survival index out come of patients . Kruskal-Wallis tests revealed an association of raised with severity survival index patients : $p<0.0001$, survival prognostic index of patients with dismorphims of neutrophils had poorer worst prognoses than those with normal neutrophils (Wilcoxon test: $p=0.002$). multivariate analysis showed higher pelger huet anomaly is a significant prognostic factor ($p=0.040$).

Conclusion: Although Hydroxy urea presents numerous positive responses, more studies on the issue of safety are essential, including Influence of treatment with Hydroxy urea on neutrophils from patients with sickle cell anaemia. A Control group (healthy individuals) (n=50); B: patients with sickle cell anaemia not treated with HU (n=50); C: patients with sickle cell anaemia treated with hydroxyl urea (n=100). Results were expressed as mean ANOVA followed by turkey posttest. ap0.05 versus A group. b0.05 versus B groupthe optimal dosage, the duration of use and the age of the patient, among other factors. Currently SCA is characterized as a chronic inflammatory disease where neutrophils initiate leukocyte adhesion to blood vessel walls, contributing thus to the development of inflammatory and vaso-occlusive processes and to the severity of the disease. Despite evidence of the essential involvement of neutrophils in the clinical modulation and the pathophysiological aspects of the disease, the mechanism by which HU modulates this effect is not fully elucidated. This study demonstrates that treatment with HU does not exert a cytotoxic effect on the neutrophils of patients with SCA, and Hydroxy urea may even be able to promote a protective effect on these cells, however there is the risk of DNA damage associated with exposure for longer periods of time. The monitoring of patients with SCA is important, since the data on the cytotoxic and genotoxic risks of HU remain inconclusive. HU inhibits the enzyme ribonucleotide reductase (RNR), causes cell-cycle arrest, and allows globin genes to be more actively expressed. By killing cycling cells, HU changes the kinetics of erythroid proliferation, forcing more F cells to be produced from primitive progenitors .Furthermore, HU therapy increases haemoglobin concentration, reduces the expression of adhesion molecules on erythrocytes, platelets and neutrophils, decreases the production of granulocytes and contributes to the improvement of clinical events, reducing the number of hospital admissions,

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