

Screening of Subclinical Functional Hemoglobin and Red Blood Cell Abnormalities among Blood Donors of Fayoum University Hospital in Egypt: Are RET-He, and IRF Useful Screening Tools?

Abstract:

Background: The effectiveness of red cell transfusion in a given blood unit that relied on both quantity and quality of donated cells undoubtedly affects prognostic outcomes. **Objective:** We aimed to determine the frequency of subclinical functional hemoglobin and red cell abnormalities in donated blood of Fayoum University Hospital in Egypt. Additionally, to assess the usefulness of reticulocyte mean hemoglobin content (RET-He) and immature reticulocyte fraction (IRF) as screening measures for such abnormalities. **Material and methods:** This cross-sectional study enrolled 200 volunteer blood donors who met the national standard criterion of blood donation. Complete blood count with reticulocyte parameters, serum ferritin, sickling test, G6PD assay, Mentzer index, and naked-eye single tube red cell osmotic fragility test were carried out. **Results:** Functional red cell abnormalities represented 44 % of this cohort. Out of them, 4.5 % had iron deficiency, 11 % had a positive sickling test, 19 % had G6PD deficiency, and 9.5 % had suspicious thalassemia. The sensitivity and specificity test for RET-He in selective identification of functional hemoglobin abnormalities in donated blood were 83.3 % and 61.2 %, respectively at a cutoff value of 26.9. Though there was no statistically significant effect of RET-He on the selective detection of G6PD deficiency, IRF had a statistically significant high level with a p-value of 0.04. **Conclusion:** Subclinical functional red cell abnormalities seem to be prevalent among blood donors. Reticulocyte/ erythrocyte indices could be useful screening tools for red cell abnormalities. Further studies are required for assessing the impact of transfusing such abnormalities to neonates and other critical recipients. possible usage of FIB- 4 and APRI as noninvasive tools to stratify cirrhotic patient into risk classes and possibly on the long run decrease the number of endoscopies required.

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