Цусны донорын цус төлжилт, төмрийн нөөцийн судалгаа

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Abstract:
Background: Early detection of iron depletion is one of the best way to prevent iron deficiency anemia and important to protect donor's health. The lack of research on iron storage and red blood cell indices among Mongolian donors was the starting point for our research.
Objective: The purpose of this study was to identify the reasons for the donor deferral in National Center for Transfusion Medicine, to evaluate iron status, red blood cell parameters for early detection of latent iron deficiency and iron deficiency anemia among blood donors and to develop management strategy to prevent iron depletion in blood donors.
Methods: To identify the rates and reasons for the donor deferral 4327 report cards belonging to donors who deferred temporary from blood donation at National Center for Transfusion Medicine between 2012-2016 were analyzed. To evaluate the status of iron storage, total of 400 blood donors, who served at the National Center for Transfusion Medicine between 2015-2018 was randomly selected, through process of questionnaires and blood test. From them, 160 donor's iron status was assessed. 92 blood donors blood donation was studied in three stages (before donation, 28 days after blood donation, 60 days after blood donation for male, 90 days after blood donation for female donors). 80 blood donors were given iron supplement to assess whether iron is recovering. Ret-He, hemoglobin and other red cell indices were analyzed by XN2000 Sysmex, a serum iron, serum ferritin levels and soluble transferrin receptor were measured by Cobas C311, Cobas E601 (Roche, Germany) and Cobas 6000 (Roche, Germany). The statistical analysis was done using Kolmogorov-Smirnov test, oneway ANOVA, Kruskal Walls, Mann-Whitney test, paired simple T test and Pierson test.
Results: 70.1% of the regular donors were deferred on physical examination, 29.9% of them deferred due to low level of hemoglobin. Red blood cell indices (hematocrit p=0.009, hemoglobin p=0.02, MCV p=0.02, MCH p=0.04, MCHC p=0.02) significantly decreased in regular blood donors compared to the first time donors. Ret-He was 32.2(31.5;33) pg for male, 31.6(30.2;32.6) pg for female donors. Ret-He level was significantly higher in male donors compare to the female donors (p<0.005). Iron storage was decreased In 15.5% of whole blood donors. There was statistical difference between serum ferritin level of male and female donors (p<0.005). Average serum ferritin was 187.2 (82; 329) µg/l for first time male donors and 67.5 (32.7;138.7) µg/l for regular male donor. Average ferritin was definitely higher in the first time donor compare to the regular male donor (p<0.001). Average serum ferritin was 62.4 (31;109) µg/l and 37.6 (21;67) µg/l respectively for first time female and regular donors. Group of donors who did not take iron supplement, ferritin was definitely decreased after first donation (p=0.001), whereas ferritin was significantly higher in donors who receiving iron supplement (p<0.001). The mean value of reticulocyte was 1.2±0.3 and 1.1±0.3 within a reference range of 0.5-2%. The mean values of IRF before and after blood donations were 6.3±2.6 and 5.9±2.7 respectively with range of 1.1-15.9%. There were no clear differences in reticulocyte count and its fractions among donors before and after blood donation.
Conclusion: On the results of this study we concluded that regular serum ferritin measurement is an useful indicator for iron depletion in blood donors. Also our data showed that red cell indices are useful for early of iron depletion. Iron supplements that were given to donors with low level of iron was able to prevent iron deficiency, and promote the red blood cell formation.

Keywords: Blood donor, serum ferritin, soluble transferriin receptor, reticulocyte hemoglobin, immature reticulocyte fraction.

Үндэслэл: Цусны нөөц, аюулгүй байдлыг хангахад бусдын эрүүл мэндийн төлөө хүмүүнлэг сэтгэлээр авлагагүй, сайн дурааараа цусаа бэлэглэгч донорын эгнээг өргөжүүлэн, эргэх холбоо тогтоох нь байнгын донорын эзлэх хувийг нэмэгдүүлэх ач холбогдолтой юм. Байнгын донорын эзлэх хувийг нэмэгдүүлснээр цус цусан бүтээгдэхүүний чанар, аюулгүй байдлыг хангах, тасралтгүй нөөцийг бүрдүүлэх боломжтой болно. ЦССҮТ-ийн тайлан мэдээгээр 2017онд байнгын донорын эзлэх хувь 55% болж, нийт 73087 нэгж цус цусан бүтээгдэхүүн үйлдвэрлэсэн нь өмнөх онуудтай харьцуулахад 69.8% өссөн байна (ЭМХТ ; 2017). Дэлхийн улс орон бүр цус цусан бүтээгдэхүүний өсөн нэмэгдэж буй хэрэгцээг хангахдаа байнгын донорын цусаа өгөхөөс түр хасагдах шалтгааныг багасгаснаар шийдвэрлэж чадна гэж үзэж байна. Цусны донорын