Importance of shielding blood donors from harm

To the Editor: An adequate and safe blood supply remains a challenge in South Africa (SA), and voluntary blood donors are a vital section of our healthcare system. Regular donors (people who make ≥3 donations in a year) are of key importance, because they are the source of a constant flow of blood to the South African National Blood Service (SANBS). The donor gives one unit of whole blood, which involves a venesection of approximately 480 ml (SA law prohibits more). The donor loses approximately 180 mg of iron per donation.[1] The upper limit of frequency of blood donation for both men and women is 6 units/year. By law in SA, a donor cannot donate more frequently than every 56 days. During the 2013 SANBS financial year,[2] 797 623 donations were collected, of which 756 358 were whole-blood collections.

A risk of frequent blood donation is iron deficiency anaemia. The REDS-II Donor Iron Status Evaluation (RISE) study documents that among frequent US blood donors, two-thirds (66%) of the women and almost half (49%) of the men were iron deficient.[3] More frequent donation, resulting in greater iron losses, was the main factor leading to iron deficiency.[3] We were unable to find data on the prevalence of iron deficiency in regular SA blood donors.

Before people can donate blood they must pass a haematocrit (HCT) test, which determines the percentage of blood volume that is made up of red blood cells. The normal range for HCT is 38.8 - 50% for men and 34.9 - 44.5% for women. The SANBS uses the copper sulphate specific gravity method for primary screening – it is cheap and easy, and widely used in blood centres worldwide. Should the donor's blood fail this test, a HemoCue test is done. This system uses a portable battery-operated photometric device for rapid determination of haemoglobin (Hb).[4] The cut-off value is 12.5 g/dl for both sexes in SA. No monitoring of donors' iron store status is routinely done by the SANBS.

Iron deficiency, even in the absence of anaemia, is associated with decreased physical endurance and work capacity, fatigue, and impairment of concentration and other cognitive functions.[5-8] The maximum iron absorption from a typical Western diet is at most 3 - 4 mg/day. Consequently, restoring the Hb concentration to pre-donation concentrations may require an average of 12 - 18 weeks in men, and 14 - 24 weeks or more in women of childbearing age.

Some authors have supported the idea that some degree of iron deficiency may be cardioprotective.[9] The only prospective, randomised clinical trial of phlebotomy to reduce body iron stores, the Iron (Fe) and Atherosclerosis Study (FeAST),[10] however, found no significant reduction in all-cause mortality or in death plus non-fatal myocardial infarction and stroke.

In our clinical cardiological practice, we have seen six male patients (mean age 50.1 years) presenting with no anaemia or a mild reduction in Hb (mean 14.36 g/dl; range 11.7 - 17.7) and normal or reduced mean corpuscular volume (mean 80.41 fl; range 70 - 94.6), all with reduced serum ferritin (mean 13.4 ng/ml; range 9 - 18) pointing to reduced iron stores, who were regular blood donors (6 times/year, mean age of first donation 28.6 years). It was estimated that the group had donated an average of 119 units of blood per individual (range 12 - 304). None volunteered that they were blood donors, and some had ascribed their fatigue or reduced sport performance to being stressed or getting older.

Our conclusion is that the current SANBS donor approach is failing to protect regular blood donors from iron deficiency. Iron deficiency may also result in 'donor loss' to the SANBS. The impact on the healthcare system of investigating donors who present to their doctors with reduced red cell indices on the full blood count (FBC), with associated reduced ferritin, with or without anaemia, must be considered, especially as in our experience patients often fail to inform their doctor that they are active blood donors. It is clear that all patients presenting with an abnormal FBC must be asked whether they are blood donors. Even then, what are the implications for a patient when the 'regular blood donor' explanation is accepted as the most likely cause of the iron deficiency, and an occult gastrointestinal malignancy is not actively excluded?

We seek to draw attention to this not uncommon clinical scenario, and encourage the SANBS to monitor serum ferritin levels (and not be satisfied with only the HCT test) in their regular blood donors. If this is deemed potentially too expensive, longer intervals between donations should be recommended, or regular donors should be reminded to have their serum ferritin checked at their own expense, at a time interval still to be determined. Advice on oral iron supplementation should also be offered – none of our patients had been given this advice.

Blood donation is an altruistic action by our citizens, and they should be shielded from potential harm.

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