USE OF SERUM FERRITIN IN PREVENTING SECONDARY HEMOCHROMATOSIS AFTER TRANSFUSION IN A REGULAR HOSPITAL SETTING.

GITA VAN DEN BERG, PHD, JARNO BOUWES, ING, JAN W.SMIT, PHD, PAMELA M.J. MCLAUGHLIN, PHD.

CERTE MEDICAL DIAGNOSTICS AND LABORATORY MEDICINE, LOCATION REFAJA HOSPITAL STADSKANAAL TE NETHERLANDS.

INTRODUCTION

Polytransfused patients used to comprise of hemoglobinopathy or thalassemia patients (1), yet now a days, the largest cohort of polytransfused patients in a regular hospital setting are patients treated for solid or hematologic malignancies, since chronic supplementation of blood is incorporated in their treatment schemes. As with the treatment of hemoglobinopathies, the excess of iron supplied can accumulate in tissues throughout the body, leading to iron overload, which can result in e.g. liver damage and heart failure.

Since one RBC bag holds about 250 mg Fe (1) and one can only get rid of 1-2 mg iron per day, iron overload is likely to occur. But at what amount of RBC bags is this threat real?

Ferritin is a protein that reflects the body’s stores of iron. Blood ferritin levels increase when the body’s iron stores increase. Monitoring serum ferritin levels has been described to be useful in preventing organ damage by secondary hemochromatosis (2). To establish if serum ferritin levels could be used to monitor our cohort of polytransfused patients we carried out a retrospective analysis of our data.

RESULTS

- Meeting the above described selection criteria 184 patients could be identified. From these patients we tried to establish a correlation between the amount of RBCs transfused within 3 months and the ferritin levels measured (Figure 1), without succes.

- However, as with the packed RBCs per 3 months, no correlation could be demonstrated between the total amount of packed RBCs transfused irrespective of time-span and the ferritin level as shown in Figure 3. The lack of correlation between number of RBCs transfused and ferritin level lies in the fact that ferritin levels can rise due to other courses, such as vitamin C deficiency, fever, infection and/or inflammation or liver diseases.

CONCLUSION & DISCUSSION

- With cumulative transfusions an increase in serum ferritin levels reflecting the tissue iron-content is expected (1). Although this was confirmed at the individual patient level, no general correlation with the amount of packed RBCs transfused and the ferritin level could be established.
- At 20 packed RBCs the mean ferritin level was around the critically level of 2000 µg/l, close to the level described to be associated with negative effects of iron-overload (1).
- Based on our results we recommend follow-up of ferritin levels in patients transfused with 20 or more packed RBCs in the context of anti-tumor therapy.
- Ferritin is a useful parameter to roughly monitor tissue iron-content at an individual level in case chelation therapy is needed as phlebotomy is usually no option in these patients.

METHODS

Ferritin was measured on the Modular E-module (Roche). Via the Sandwich principle and detected through a current by the ECLI A-method.

Reportable range between 0,5-2000 µg/L, <10 µg/L being repeated, > 2000 µg/L diluted and reanalyzed.

Ferritin reference ranges are assay specific: 30-400 µg/L for men 13-150 µg/L for women

Based on analysis of transfusion data from our Labosys laboratory system (Philips) patients transfused with ≥20 packed red cells for tumor treatment purposes over the past 5 year, combined with at least one ferritin level of ≥ 1000 µg/l were selected.

Statistical analysis were performed using Analyse It (Microsoft).

REFERENCES:
