Egg on the Table

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Generally, dialysis patients are under potential risk for iron deficiency because they lose a small amount of blood during every hemodialysis session. Iron deficiency is a major cause of anemia that is resistant to erythropoietin therapy in dialysis patients (1); therefore, iron agents are often administered to dialysis patients, in most cases intravenously.

Conversely, aimless continuation of iron administration to dialysis patients sometimes causes iron overload, which is also clearly harmful. Iron overload has been thought to induce the accumulation of iron in the organs and subsequent organ dysfunctions (2). In addition, the risk for immunologic disturbance through reticuloendothelial suppression (3) and the promotion of atherosclerosis through the induction of oxidative stress (4) were recently suggested. Thus, the total amount of iron storage in dialysis patients should be controlled to within a certain physiologic range. A precise marker with which to monitor iron storage is thus desired.

Serum ferritin concentration (sFerritin) has been widely applied for this purpose. In fact, clinical guidelines such as the Kidney Dialysis Outcomes Quality Initiative (KDOQI) recommend its use to estimate iron storage in patients with chronic kidney disease (5); however, whether sFerritin precisely enhances the amount of bone marrow iron storage in dialysis patients has not been confirmed. In a broad sense, dialysis patients are under chronic inflammatory status. Thus, one might suspect that sFerritin would reflect inflammation more keenly than iron storage.

Rocha et al. (6) offered the first answer to this question. Their method was quite simple and straightforward, which seems even somewhat old-fashioned, but for that very reason, the results obtained look rather persuasive. Anyone could have planned their study strategy, but no one had ever executed it before. One reason that they were able to conduct such a study is that they are bone histomorphometrists and are therefore familiar with preparing bone samples and conducting histologic evaluation including bone marrow area. With their contribution, the adequacy of sFerritin as a marker of bone marrow iron storage in dialysis patients has now been supported by evidence.

Of course, we have not reached a final conclusion about measuring iron storage in dialysis patients. Even if it is confirmed that sFerritin is a proper marker of iron storage level, its appropriate levels in dialysis patients remain to be elucidated.

From that standpoint, the work of Rocha et al. is unsatisfactory in a few aspects. First, the mean sFerritin level was extremely high in their patients. The majority of the patients would be considered to be in iron overload; therefore, their work clearly demonstrated that sFerritin precisely reflected bone marrow iron storage levels in dialysis patients who could be in iron overload, but sFerritin may not be so accurate for patients with iron deficiency. Because both iron deficiency and iron overload are harmful, the monitor must precisely reflect iron levels at both low and high levels. Thus, a similar examination might be required among dialysis patients with relatively low sFerritin levels next time.

Nevertheless, their method, namely counting the number of cells that stained positive for iron in the bone marrow area, seems to be suitable for the overload condition; however, the differences in iron contents among stained cells could substantially affect the total amount of iron storage among iron-deficient dialysis patients. A totally new method may have to be developed to confirm the adequacy of sFerritin as a marker of iron storage levels in such conditions.

It is not difficult to criticize the article after it is published. Someone might claim that it was Columbus’s fault that he damaged the narrow end of an egg to make it stand on a table. The damage might have been better created at the other, broader end. Maybe he should have applied a totally different strategy to make the egg stand without damaging it. Such debates, however, appear only after the egg has been set on the table. Now it is our turn to start developing the most appropriate method to monitor the amount of iron storage in all dialysis patients, observing the egg that has been set by the Brazilian pioneers.

Disclosures

None.

References


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See related article, “Serum Ferritin Level Remains a Reliable Marker of Bone Marrow Iron Stores Evaluated by Histomorphometry in Hemodialysis Patients,” on pages 105–109.