Usefulness of Methemoglobin/Haptoglobin Analysis in the Follow-up of Severe Immune Hemolytic Anemia

To the Editor:

I was surprised and impressed by the dramatic improvement observed in a Coombs-positive hemolytic anemia patient reported by Kuo et al (June 2001). In this outstanding result seems to have resulted from the fact that haptoglobin functioned properly, thanks to the healthy liver, which minimized damage to the kidneys and other organs caused by the onset of anemia. However, we may not always achieve such successful results. In order to make a decision on whether or not to conduct the blood transfusion, it is important that anemia-induced hemoglobin loads to kidneys and other organs are correctly evaluated. Haptoglobin, which is produced mainly in the liver, combines with hemoglobin produced as a result of hemolysis. This haptoglobin-hemoglobin complex is then taken into the liver and metabolized there. However, the amount of haptoglobin produced is often not enough to keep up with excessive hemolysis. As a result, a state of ahaptoglobinemia is induced, as in this clinical case. Moreover, when excessive hemoglobin amounts continue to be released, the haptoglobin elimination mechanism cannot keep up and, eventually, another metabolic route begins functioning. In other words, hemes are removed from excessive hemoglobin to become methemes and combined with albumin to form methemalbumin, which is metabolized in the liver. In view of this metabolic flow, detecting haptoglobin/metheme is exceedingly useful in detecting the level of hemoglobin load in anemia patients. The detection of both haptoglobin and methemalbumin fractions in the serum from patients was conducted using 5% polyacrylamide gel electrophoresis and o-dianisidine staining method (Figure 1). The metheme concentration is directly proportional to the staining level of methemalbumin. This method allows simultaneous evaluation of both haptoglobin and metheme. Disappearance of haptoglobin and increase of metheme indicates extremely serious anemia. Detection of haptoglobin and methemalbumin contributes useful information for continued hemolysis follow-up.

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We thank Dr. Okazaki and his colleagues for their interest in our article (June 2001). The reasons that corticosteroids and blood transfusion were not administered to our patient include his young age and the relatively well-preserved liver function and hemodynamics. We agree with Dr. Okazaki that we may not always achieve such successful results by antituberculosis therapy alone.

We think Dr. Okazaki also makes a good point that detecting haptoglobin/metheme is useful in the assessment of hemoglobin load in patients with hemolytic anemia. This laboratory procedure, however, is uncommon in current hematology practice. However, serial laboratory data of our patient showed that the serum level of lactate dehydrogenase, a common biochemistry index, was well correlated with the clinical course of hemolysis. In

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We thank Dr. Jackson and Dr. Shorr for their thorough discussion, in response to our recent review of the effects of vasopressin on cardiac performance. We also conducted a retrospective review in our institution of 50 patients who had received vasopressin for hemodynamic support in septic shock. In the subset of patients with a pulmonary artery catheter in place, we found a mean decrease in cardiac index of 11% at 4 h of treatment with vasopressin infusion. This effect appeared to be dose related; doses > 0.03 U/min were significantly associated with a decrease in the cardiac index (p = 0.0026).

We agree that the potential for a decrease in cardiac index should be anticipated at higher than physiologic doses of vasopressin. We also agree that the use of vasopressin in septic shock is continued hemolysis follow-up. We thank Dr. Okazaki and his colleagues for their interest in our article (June 2001). The reasons that corticosteroids and blood transfusion were not administered to our patient include his young age and the relatively well-preserved liver function and hemodynamics. We agree with Dr. Okazaki that we may not always achieve such successful results by antituberculosis therapy alone.

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