Spurious Macrocytic Anemia

To the Editor,

Macrocytosis often accompanied by anemia is usually due to folic acid or vitamin B12 deficiency, liver disease or alcoholism. In the absence of these pathological conditions and in the presence of cold agglutinins, erroneous macrocytic values can be produced by the Coulter Counter.

A 64-year-old male was admitted to the Department of Medicine A because of pneumonia. On admission the temperature was 37.6 °C, the blood pressure 160/100 mm Hg, and auscultatory findings were consistent with right lower lobe pneumonia. The relevant laboratory data were: a sedimentation rate of 40/60 mm (Westergren), hemoglobin 12.8 g/dl, hematocrit 38%, RBC 1.8 X 10^6/µl, mean corpuscular volume 176 fl, mean corpuscular hemoglobin (MCH) 70 pg and mean corpuscular hemoglobin concentration (MCHC) 40%. Similar values were obtained in 8 consecutive blood counts. The peripheral blood smear showed marked erythrocyte agglutination. The white blood cell count (WBC) was 10,300/µl with a slight shift to the left, and the platelet count was 120,000/µl. Cultures of the sputum were negative and no acid fast bacilli were seen on a direct smear. Serum anti-I cold agglutinins in a titer of 1:64 were demonstrated. The patient was successfully treated with tetracycline and cotrimoxazole and was discharged on the 10th day of hospitalization.

Spurious macrocytic anemia has been described in very few patients all of whom had serum cold agglutinins [1-4]. The mechanism by which these agglutinins cause this phenomenon is readily explained by the technique of the Coulter Counter. Anti-I cold reactive antibodies produce particles with increased volume by agglutinating erythrocytes. The counter considers each microagglutinate as one cell, and thus less RBCs are being recorded each with a higher volume, 1.8 × 10^6/µl and 176 fl, in the patient described. Accordingly, high MCH and MCHC values are calculated. The clue to diagnosis of spurious macrocytic anemia is the presence of high values of MCH and MCHC (> 36%) together with disproportionally high hemoglobin and hematocrit values.

This case, as well as those previously reported, illustrate the phenomenon of ‘spurious macrocytic anemia’ and emphasize that, in its presence, serum cold agglutinins should be looked for.

References
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