“Peroxidase Response” of Erythron in Anemia, Preliminary Report

By

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(Received for publication, October 10, 1952)

I devised a modification of Sato-Shoji's¹⁾ counting chamber method of copper peroxidase reaction (for leucocytes)—a counting chamber peroxidase method for erythrocytes. Under the method, erythrocytes showed a various degree of the intensity of peroxidase reaction, never recognized by film method.

I applied this method to 53 cases of various kind of anemia and 81 non-anemic cases and obtained the results that the peroxidase picture of erythrocytes in non-anemic cases was rather monotonous or uniform and that almost all the reds were of weakly peroxidase-positive type with only a few number of blue granules at most in one cell, while, in anemic cases, on the contrary, the picture was greatly altered and the variety of intensity of peroxidase reaction of each erythrocyte became very remarkable. Striking was the occurrence of a large number of strongly peroxidase-positive erythrocytes with abundant blue granules.

Further investigation of 6 other anemic cases i.e. one case of iron deficiency anemia of a weanling, one case of idiopathic thrombocytopenic purpura, one case of erythroblastosis fetalis due to Rh incompatibility, one case of anemia due to intestinal hemorrhage, one case of pernicious anemia and one infantile case of megaloblastic anemia, which were observed under the serial examination of peroxidase picture of erythrocytes, showed that a certain regularity must exist in the relationship between the peroxidase activity of erythrocytes or/and erythroblasts on one hand and the hemopoietic activity of erythron on the other. In these cases, at an early stage of blood regeneration, the peroxidase activity of erythrocytes in blood or/and erythroblasts in bone marrow was greatly stimulated, in other words, strongly peroxidase-positive erythrocytes or/and erythroblasts were developed in blood or/and in bone marrow. So I desire to suggest the designation of “Peroxidase Response” of erythron for this phenomenon—a critical increase of strongly peroxidase-positive erythron in blood or/and in bone marrow at an early stage of blood regeneration in anemic cases treated specifically. It is well known that the reticulocyte response is the very first sign of blood regeneration. But the “Peroxidase Response” of either erythrocytes in blood or erythroblasts in bone marrow can, it seems, occur at an earlier stage than the reticulocyte response, as will be seen from my own cases—one infantile case of megaloblastic anemia and one case of pernicious anemia; in the latter case peroxidase picture was observed under serial bone marrow punctures.

The alleged striking increase of strongly peroxidase-positive erythrocytes in anemic cases might be an expression of “Peroxidase Response” of erythron.

The details will be reported in the near future in this Journal.

References

- 1) Sato, A. and Shoji, K.; J. Lab. and Clin. Med. 1928, **13**, 1058.

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