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Trace elements related to anemia

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Abstract:
Iron deficiency is the most common cause of anemia. Zinc, copper, manganese, molybdenum, and cobalt are also related to anemia. The body of an adult man stores approximately 4500 mg of iron. About 60% of this iron is in the form of hemoglobin, 20% is in the storage form of iron, 7% to 8% is contained in myoglobin in the muscle, and 12% to 13% is stored in iron-containing enzymes. The average amount of iron lost daily has been estimated to be approximately 1.0 mg in normal individuals. These losses are balanced by ingesting an equivalent amount of iron from the diet. Because of increasing iron needs of infants and adolescents during growth, and blood loss during menstruation in females, these patient groups may suffer from lack of iron, especially if they ingest inadequate amounts of iron from their meals. Pica is one of the symptomes of iron deficiency anemia. Pacophagia is one of clinical manifestation of pica which is characterized by eating ice. Measuring serum zinc before and after iron treatment in patients with iron deficiency anemia, we observed decrease of zinc concentration in patients with pica whereas normal zinc concentration in patients without pica. However there was no significance between two groups. Zinc deficiency leads to pathological signs related to impaired function of plasma membrane proteins such as erythrocyte plasma membrane. This impaired function causes hemolytic anemia. On the contrary, the excess of zinc also leads to anemia because suppression of iron absorption occur. Hypochromic microcytic anemia has been observed in copper deficiency. Since the activity of cytochrome oxidase, which contains copper, decrease in this condition, iron will not be mounted in heme followed by anemia because of failure of iron reduction. Ceruloplasmin, which also have copper, make iron to combine with transferrin by converting ferrous iron to ferric iron through oxidative process. Therefore, lack of ceruloplasmin cause anemia similar to that in iron deficiency.

Key words: iron deficiency anemia, pica, zinc, copper, ceruloplasmin

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