Nitric oxide in beta-thalassemia minor: what factors contribute?

Beta talasemi minörde nitrik oksit: hangisi katkı sağlar?

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To the Editor,

I read with great interest the recent publication by Bayraktar et al. [1] on nitric oxide (NO) in beta thalassemia minor. in which they reached the conclusion that "These findings confirm that plasma NO levels in beta-thalassemia minor patients are decreased at the time of diagnosis." Bayraktar et al. also noted the possible usefulness of NO level in assessing the prognosis and follow-up evaluation. There are some concerns with respect to the findings in this study. First, NO level can be disturbed by many factors. For example, the underlying pathophysiological conditions of the studied patients should be discussed. Some co-disorders and drug usage might alter the NO level among the patients. In addition, differences in food intake pattern or in nitrate level might be another important underlying condition that affects NO level [2]. Second, the quality control in laboratory analysis and sample collection must be addressed. Third, there is a concern regarding the proposal of Bayraktar et al. regarding the correlation between hemolysis and NO level in the studied patients. Indeed, hemolysis is not common in beta thalassemia minor. It remains doubtful whether the included cases in this study were accurately classified into the beta thalassemia minor group.

References

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Author Reply

My response regarding the manuscript entitled "Nitric oxide in beta-thalassemia minor: what factors contribute?" is given below.

Firstly: In our patients, there were no co-disorders or drug usage. Patients with acute or chronic infections, chronic inflammatory diseases, heart diseases, and other anemias were not included in the study. Patients with similar underlying pathophysiological conditions were selected. In all patients, blood samples were done in a fasting state in the morning. Thus, there were no differences in food intake pattern.

However, nitric oxide levels can be affected by food intake pattern, co-disorders and drug usage [1].

Secondly: In all patients, blood samples were done in a fasting state and in the morning. Centrifuge was done and plasma was separated. Plasma was frozen (-70°C). Nitric oxide levels of all patients were measured together. Plasma nitrite/nitrate levels were measured with the Griess reaction using a spectrophotometer at 545 nm. Nitrite (0.1M sodium nitrite in water) was mixed with sulfanilamide solution (1% sulfanilamide in 5% phosphoric acid) first, followed immediately by addition of NED solution (0.1% N-1-napthylethylenediamine dihydrochloride in water). The absorbance was measured within 30 minutes.

Thirdly: Heterozygous beta-thalassemia (thalassemia minor) is described as: no or mild anemia, microcytosis and hypochromia, mild hemolysis manifested by slight reticulocytosis and splenomegaly [2]. Hemolytic anemia develops in direct proportion to the deficiency of the beta globin chain that cannot be produced in thalassemia sufferers [3-6]. According to these references, hemolytic anemia may develop, particularly in conditions

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of physiological stress such as infection, pregnancy or surgery, and anemia may increase and present symptoms. Another possible explanation for hemolysis is the apparent decrease in spectrin content, including deficient or defective spectrin synthesis in thalassemia erythroid precursors or globin chain-induced membrane changes that lead to spectrin dissociation from the membrane [7].

Indeed, mild hemolysis occurs in beta thalassemia minor. In contrast, thalassemia intermedia and thalassemia major are probably associated with more severe degrees of hemolysis. It would have been preferable if the nitric oxide levels of the patient group were also compared with thalassemia major patients or Hb S patients as a positive control. Our small study population consisted of patients diagnosed with beta thalassemia minor. Further studies are needed in a large number of patients.

Sincerely,

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