

TRACE ELEMENTS AND HEMATOLOGICAL CHANGES IN THALASSAEMIA MAJOR AND MINOR

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Abstract

Background: The Thalassaemias are hereditary hemolytic anaemia due to genetic defect in the DNA or in the messenger RNA. Many studies on B-thalassaemia (major and minor) have reported variation in the level of the trace elements zinc, Copper and Magnesium. These variations may play a role in cellular abnormalities, which characterize this disorder. Thus, these trace elements have been used as indices for following up these patients.

Objective: To assess the level of serum Cu, Zn and Mg in thalassaemic patients (major and minor) and to investigate different hematological parameters as well as serum ferritin in those patients.

Methods: 72 patients with B-thalassaemia major (Th. M.), 17 patients with B- thalassaemia minor (Th.Mn.) and 30 healthy age matched subjects who served as control. Trace elements, Hb, PCV, MCH and MCHC and serum ferritin were estimated.

Results: A significant decrease in Hb concentration and MCHC was found in Th.M. compared to control group whereas a significant increase in MCV, MCH and MCHC was found in Th.M. compared to Th.Mn. In addition, MCV, MCH and MCHC were

significantly reduced in Th.Mn. compared to control, while PCV level was significantly higher when compared to Th.M. patients and control group.

Serum Cu and Zn in Th.M. were significantly increased when compared to control group while serum Mg in Th.M. was significantly reduced when compared to healthy control but not in Th.Mn. In Th.Mn., serum Cu was significantly increase when compared to control and to Th.M. patients.

Serum ferritin was significantly high in B-thalassaemia major and minor when compared to control. In addition, it was significantly high in Th. M. compared to Th.Mn. Furthermore, only serum Zn and Mg showed a significant positive correlation with PCV in B-Th.M. patients.

Conclusion: Serum Cu and ferritin were high in B-Th.M. and Th.Mn., serum Mg was low and serum Zn was high in B-Th.M. Since serum Zn and Mg were closely related to PCV, therefore the therapeutic value of Mg and Zn supplementation should be tested in those patients.

Keywords: Trace Elements, Thalassaemia Major and Minor, Hematological Changes

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Introduction

Copper (Cu), Zinc (Zn) and magnesium (Mg) are biological elements that are called as trace elements because small amount of them are found in human body^[1], however they are essential metals that are required

for growth and proliferation of healthy cells and for normal lymphocytes maturation and regulation of the immune function^[2]. Moreover, changes in the level of these elements may impair cellular and physiological functions through changes in the activities of metalloenzymes which require a small and constant number of metal per mole to attain full activity of these enzymes^[3].

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