Thesis Title Assessment of Autonomic Functions in Thalassemic Patients

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ABSTRACT

Abnormal autonomic control of the cardiovascular system can be one of the mechanisms involved in the pathogenesis of post-transfusion hypertension syndrome, which affects some thalassemic patients after multiple blood transfusion. This study began to assess the function of the cardiovascular autonomic regulation by using simple bedside tests, following Ewing et al., 1985. These tests are 1)postural blood pressure response, expressed as change in systolic blood pressure; 2) postural heart rate response, expressed as 30:15 ratio; 3) response to deep breathing, expressed as maximum - minimum heart rate during a breathing cycle; 4) response to Valsalva maneuver, expressed as Valsalva ratio; and 5) response to sustained handgrip exercise, expressed as a rise in diastolic blood pressure.

The cardiovascular autonomic functions were assessed in twenty-nine thalassemic patients and twenty-nine age- and sex-matched control subjects. The thalassemic group had significant

decreases in four responses compared to the control group: heart rate response to postural change ($p = 0.000$), deep breathing ($p = 0.000$), and Valsalva maneuver ($p = 0.017$), and blood pressure response to sustained handgrip ($p = 0.027$). However, there was no significant difference in the postural blood pressure response. Splenectomy had no effect on the test results. In addition, there is no sex difference in the autonomic response in both the control and the thalassemic groups, except for the blood pressure response to handgrip exercise in control group, where the response in women is smaller than men. Finally, in the thalassemic group, there was no significant correlation between any of the test results and the following factors: age, age at the time of diagnosis, hemoglobin concentration, hematocrit, red and white cell counts, platelet counts, mean corpuscular volume, mean corpuscular hemoglobin, mean corpuscular hemoglobin concentration, serum ferritin, and the cardiothoracic ratio. The only exception was the significant correlation between the heart rate response to deep breathing and age ($p \leq 0.01$) in both groups.

The results suggest a defect in the parasympathetic control of the heart, but not the sympathetic control to the heart and blood vessels. This abnormality may not contribute to the pathogenesis of post-transfusion hypertension. Further study is needed to answer if there is any increase in the sympathetic control to the blood vessels that can cause or facilitate the occurrance of the syndrome. The lack of correlation between the autonomic test results and relevant factors precludes the application of the tests as an index for disease severity or as a prognostic tool for thalassemic patients.