Energy Metabolism Impairment in Heart of Rats Subjected to Mild Hyperhomocysteinemia

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INTRODUCTION: Mild hyperhomocysteinemia, characterized by an elevated plasma homocysteine concentration between 15 to 30 µmol/L, has been considered a risk factor for cardiovascular diseases, but the mechanisms need to be clarified. In the present study we evaluate some parameters of energy metabolism in heart of adult rats subjected to experimental mild hyperhomocysteinemia. MATERIALS AND METHODS: Homocysteine (0.03 µmol/g of body weight) or saline (control) were administered subcutaneously to Wistar rats from the 30th to the 60th day of life. Animals were killed 12 h after the last injection and the heart was removed. RESULTS AND DISCUSSION: Results showed that the activities of pyruvate kinase, creatine kinase, succinate dehydrogenase and complexes II and IV (cytochrome c oxidase) of respiratory chain were inhibited, while the uptake and oxidation of glucose were not altered by mild hyperhomocysteinemia in heart of adult rats. CONCLUSION: These results showed that the mild hyperhomocysteinemia impairs the cardiac bioenergetics which might contribute, at least in part, to the risk of cardiovascular diseases.

Keywords: Homocysteine, Mild hyperhomocysteinemia, energy metabolism, heart and cardiovascular diseases

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