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Is there a link between ferritin and the cardiac function in anorexic adolescents ?

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INTRODUCTION

Very little is carried out on iron and hematological status in AN patients. Normal serum iron and elevated serum ferritin concentration were the most relevant results seen in few studies based on small cohorts of AN patients. In cardiac literature an overload of iron stores raises the risk of ischemic heart disease. Because concentrations of serum ferritin are directly proportional to intracellular ferritin concentrations, it is considered to be the best clinical measure of body iron stores and we used this parameter in our study. Iron overload has been found to increase vascular oxidative stress and accelerate arterial thrombosis by promotion of oxidized low-density lipoprotein and direct endothelial injury.

AIM

The aim of this study was to compare in the acute state of undernutrition, biochemical, endocrine and cardiac parameters between female anorexic adolescents with a high ferritin and a normal ferritin.

METHOD

The study has a prospective design as all patients with anorexia nervosa (AN) admitted to our Eating Disorder Unit from 2002 till 2012 were scheduled to undergo a full clinical examination, biochemical and endocrine bilan together with a cardiac examination (Echocardiographic evaluation + 12 lead ECG). In total 311 adolescent girls (9.8-17.87 years) were referred during the current study and all fulfilled the DMS-IV (Diagnostic and Statistical Manual of Mental disorders, 4th edition DSM-IV) criteria ascertained by a child psychiatrist and a paediatric nutritionist. None of the patients had a family history of cardiac diseases or of any systemic disease involving the cardiovascular system. Laboratory and clinical parameters: Blood samples were drawn for: BUN, creatinine, electrolytes, cholesterol, thyroid hormones, insulin growth factor-1, iron, ferritin, zinc, hemoglobin, hematocrite, leukocytes, fibrinogen and liver tests. Body mass index (kg/m²) was calculated and curves and centiles were used as reported by Rolland-Cachera et al.(1991).

RESULTS

In total we identified a high ferritin level > 137 ng/ml in 82 of the 311 in the anorexic girls (26,4%). Risk factors for developing a high ferritin are: BMI: 14.41 ± 1.59 kg/m²; HR: 56.01 ± 16.36 bpm; LVM/height^{2.7}: 23.99 ± 5.25 g/m^{2.7}; cholesterol: 192.65 ± 50.70 mg/dl; AST: 31.58 ± 12.11 U/L; ALT: 43.93 ± 47.67 U/L, IGF-1: 113.16 ± 74.97 ng/ml and FT3: 3.08 ± 1.80 pmol/L. The euthyroid sick syndrome was found in 33% of the patients with high ferritin versus 18.3% in the normal ferritin group.

CONCLUSION

A higher ferritin level is correlated with a higher cholesterol level and lower FT3 level. Both parameters are cardiovascular risk factors for atherosclerosis. Further research is needed.