

ABSTRACT

Ferritin, oxidative stress and insulin resistance

Aim: The aim of our cross-sectional study was to assess the relationships between body iron stores, oxidative stress and impaired insulin sensitivity in a cohort of healthy men in primary prevention of cardiovascular disease.

Methods: We examined 151 volunteers, aged 35– 60 years. Anthropometric parameters, markers of metabolic syndrome, insulin resistance, inflammatory markers, parameters of oxidative stress and parameters of endothelial dysfunction were measured.

Results: Ferritin correlated positively with waist circumference, body mass index, impaired insulin sensitivity, plasma triglycerides and inversely with high-density lipoprotein cholesterol. We observed positive correlations between ferritin, oxidized low-density lipoprotein and advanced oxidation protein products after adjustment for age, waist circumference, body mass index and measured inflammatory markers (high-sensitivity C-reactive protein, fibrinogen, interleukin-6 and tumor necrosis factor- α). In a stepwise multiple regression analysis, triglycerides, waist circumference and elevated transaminases were independent determinants of the serum ferritin level.

Conclusions: Our results provide evidence for a relationship between plasma ferritin and oxidative modification of lipids as well as proteins *in vivo*. Higher body iron stores may contribute to impaired insulin sensitivity through increased oxidative stress in a cohort of healthy men.

Iron stores are associated with asymptomatic carotid atherosclerosis

Introduction: The aim of our study was to assess the impact of increased iron stores on the presence of asymptomatic atherosclerosis in a cohort of healthy men. We anticipated that higher iron stores would be associated with higher sCD163 concentrations, elevated markers of oxidative stress, inflammation and higher common carotid intima-media thickness, independently of traditional risk factors of atherosclerosis.

Methods: In this cross-sectional study that included 72 healthy men we measured the ratio of plasma-circulating transferrin receptors concentration to plasma ferritin concentration, certain inflammatory and oxidative stress markers, insulin sensitivity, plasma lipids, markers of endothelial dysfunction and the ultrasonography of intima media thickness and compliance of common carotid artery. Moreover, we assessed the expression of transferrin receptors (CD71) and scavenger receptors type B (CD36) on monocytes by flow cytometry.

Results: The TfR/F ratio and ferritin showed significant association with IACC. Multivariate analysis confirmed that the correlation of TfR/F with IACC is independent of traditional risk factors of atherosclerosis. The TfR/F ratio correlated with other indicators of atherosclerotic process fibrinogen, von Willebrand factor, sCD163 and interleukin-8. Men with the highest monocyte transferrin receptor expression showed significantly higher values of carotid artery compliance and lower values of beta stiffness index as well as E-selectin in comparison with men with the lowest monocyte transferrin receptor expressions. Moreover, there was a positive association between monocyte transferrin receptor expression and carotid artery compliance.

Conclusions: Our study showed a clear association of body iron stores expressed by the TfR/F ratio with asymptomatic carotid atherosclerosis. TfR/F further exhibited an independent positive correlation with fibrinogen and a negative correlation with sCD163 and IL-8. Moreover, we found a positive association between monocyte transferrin receptor expression and carotid artery compliance.