Association of elevated serum ferritin concentration with insulin resistance and impaired glucose metabolism in Korean men and women.


Source
Division of Endocrinology and Metabolism, Department of Internal Medicine, Soonchunhyang University Bucheon Hospital, Bucheon 420-767, South Korea. hkkim0801@amc.seoul.kr

Abstract
Increased serum ferritin concentrations in nonpathologic conditions, reflecting subclinical iron overload, have been reported to be associated with insulin resistance and an increased risk of type 2 diabetes mellitus (DM). However, serum ferritin concentrations differ significantly according to sex and ethnicity; and data concerning the relationship between serum ferritin concentrations and glucose metabolism abnormalities in Asian men and women are conflicting. This cross-sectional study investigated the association of serum ferritin concentrations with insulin resistance and impaired glucose metabolism in a large number of subjects with normal fasting glucose (NFG) level, impaired fasting glucose (IFG) level, or type 2 DM. We analyzed clinical and laboratory data from 12,090 subjects (6,378 men and 5,712 women; age, 20-89 years) who underwent general medical checkups. The study population included 1,054 subjects with type 2 DM, 3,783 subjects with IFG level, and 7,253 subjects with NFG level. Serum ferritin, hemoglobin A1c, fasting glucose, lipid, and insulin levels were measured. Insulin resistance and β-cell function indices were derived from a homeostasis model assessment. Serum ferritin concentrations were highest in the DM group, followed by the IFG group and the NFG group, in both men and women (186 ± 127, 176 ± 108, and 156 ± 92 ng/mL, respectively, in men; 85 ± 62, 75 ± 55, and 59 ± 47 ng/mL, respectively, in women). After adjustment for other variables using multiple regression analysis, homeostasis model assessment of insulin resistance was independently associated with serum ferritin concentration in men, but not in women. When the fourth quartile of ferritin was compared with the first quartile, the age-adjusted odds ratio (OR) for type 2 DM was 1.71 (95% confidence interval, 1.38-2.12) in men and 1.50 (1.05-2.13) in women. The OR in men was attenuated to 1.27 (1.01-1.60) but remained significant after adjustment for body mass index (BMI), waist circumference, blood pressure, serum lipids, liver enzymes, and high-sensitivity C-
reactive protein (hsCRP). In nondiabetic subjects, the age-adjusted OR for IFG in the fourth quartile of ferritin was 1.82 (1.56-2.13) in men and 1.68 (1.40-2.02) in women. The OR was attenuated to 1.31 (1.11-1.55) in men and 1.45 (1.19-1.78) in women after adjustment for BMI, waist circumference, blood pressure, serum lipids, liver enzymes, and hsCRP. In NFG subjects, the age-adjusted OR for metabolic syndrome in the fourth quartile of ferritin concentration was 2.85 (1.99-4.07) in men and 1.21 (0.82-1.79) in women. In men, the OR was attenuated to 1.58 (1.06-2.37) after adjustment for BMI, liver enzymes, and hsCRP. Increased serum concentrations of ferritin are associated with insulin resistance, type 2 DM, IFG, and metabolic syndrome in men, but only with IFG in women. These results suggest that iron overload is associated with insulin resistance in men, but not in women.

Copyright © 2011. Published by Elsevier Inc.

PMID:20423745