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Polymorphism of *HFE* gene in ischemic heart diseases and its relation with iron overload

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Background: Ischemic Heart Disease (IHD) burden consists of years of life lost worldwide. Diabetes mellitus is the major risk factor of coronary artery diseases; C282Y allele of *HFE* gene is significantly associated with iron overload (IO). To which extent *HFE* gene mutations and metabolic alterations contribute to the presence of atherogenic lipoprotein modifications happen in primary IO remains undetermined.

Aim: Aim of the presented work was concerned to detect whether or not the C282Y and H63D mutations in the *HFE* gene might be associated with increased risk of ischemic heart diseases in obese patients and then to see their correlations with iron overload.

Materials & Methods: This cross sectional study was conducted in Cardiac Care Unit at Al-Zahra Teaching Hospital, Karbala and Najaf Center for Heart Diseases during December 2015 to September 2016. It included 100 subjects (50 obese IHD patients and another 50 obese individuals as control group. Iron, total iron binding capacity (TIBC), ferritin, hs-Troponin I and lipid profile were determined. DNA was extracted from fresh blood by using Geneaid kit. PCR amplification by using specified primers and then Polymerase Chain Reaction–Restriction Fragment Length Polymorphism (PCR-RFLP) and electrophoresis by using agarose gel (2%) with ethidium bromide was applied to detect the specific fragments.

Results: The mean age of patient group was 58.06±10.22 (range 38-79 years) (30 male and 20 female). There is a significant difference between the allele frequencies of C282Y mutations in obese IHD patient groups as compared with obese controls ($P<0.05$). The relationships between the GA and GG genotypes in C282Y mutation in parameters: hs-Troponin I, lipid profile (total cholesterol, TG, LDL-C, HDL-C and VLDL-C), BMI, iron, TIBC and serum ferritin. The data observed no significant differences between the two groups ($P>0.05$) with all parameters except iron overload and hs-troponin I with C282Y mutation in patient groups.

Conclusion: *HFE* gene polymorphism C282Y is associated with development of ischemic heart diseases. Iron, TIBC and ferritin are related with allele polymorphism C282Y mutation. The *HFE* mutations may act as genetic markers of IHD risk in Iraq population. There were significant elevations in serum lipid profile (total cholesterol, and LDL-cholesterol) in patients as compared with control group due to effect of IHD. Iron overload was elevated in IHD patients as compared with obese control group.

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