Associations of Paraoxonase-1 Polymorphism (p.Q192R) with Lipids, Lipoproteins and Cardiovascular Risk Parameters in a Brazilian Population Sample

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Introduction: Evidence suggests that Paraoxonase 1 (PON1) confers important antioxidant and anti-inflammatory properties when associated with high-density lipoproteins (HDL). The aim of the study was to investigate the relationship of SNP p.Q192R (rs662) of the PON1 gene with clinical, anthropometrical and biochemical determinants of a representative Brazilian population (n=590).

Material and Methods: In the present work we studied healthy normolipidemic volunteers (Female= 332, Male= 260; 19-75 years of age). Total genomic DNA was extracted using standard techniques from peripheral blood and the SNPs detected in the TaqMan® SNP OpenArray® Genotyping Platform (Applied Biosystems). Serum cholesterol (C), triglycerides (TG), HDL-C, uric acid (mg/dL) were determined by enzymatic and kinetic methods in Modular Analytics EVO P (Roche). Very-low density lipoprotein cholesterol (VLDL-C) was estimated as TG/5. PON activity was measured with a chromogenic method using paraoxon as substrate. LDL particle size was estimated by TG/HDL-C and Castelli index I by cholesterol/HDL-C. Results and Discussion: The presence of the rare allele was found to be associated with significant increases of paraoxonase activity (CC=14.49 ± 12.59; CT+TT=53.91 ± 26.58 umol/min; p<0.001) and HDL-C (CC=54 ± 19; CT+TT=58 ± 20 mg/dL; p=0.009). Reductions of TG (CC=82 ±30; CT+TT=76 ± 28 mg/dL; p=0.025), VLDL-C (CC=16 ± 6; CT+TT= 15 ± 6 mg/dL; p=0.030), Castelli index I (CC=3.48 ± 1.10; CT+TT=3.26 ± 1.00; p=0.018), LDL particle size (CC=1.81 ± 1.11; CT+TT=1.55 ± 1.01; p=0.001) and uric acid (CC=4.65 ± 1.16; CT+TT=4.41 ± 1.17 mg/dL; p=0.022) were observed. Conclusions: The presence of the allele p.Q192 of PON1 is associated with several anti-atherogenic plasma changes in a representative Brazilian population sample.

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Keywords: PON1, p.Q192R, lipids.