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Identification of candidate genes for the risk of cvd in indians: meta-analysis of available literature

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The global burden of cardiovascular diseases (CVDs) is showing an increasing trend with developing countries contributing maximum to this epidemic. Though numerous researches have addressed the issue of primary and secondary prevention, in diversified countries like India CVD risk is unexplainable by conventional risk factors. Few scattered reports have shown that Indians are genetically predisposed to premature CVD. We herewith aimed to perform a meta-analysis of CVD associated variants and assessed their association with disease development in Indians.

This meta-analysis was undertaken to assess the impact of 5 different sets of genes - apolipoprotein genes, lipoprotein genes, endothelial nitric oxide synthase (eNOS) gene, methylene tetrahydrofolatereductase(MTHFR) gene and cytochrome p450 (CYP450) geneson CVD in 35 published observational studies. Various alleles (n= 23) of 12 genes (apolipoprotein – 4, lipoprotein – 4, eNOS – 1, MTHFR – 1, CYP450 – 2) were studied for their association with CVD in Indians.

Though non-significant, mild to moderate heterogeneity was observed (I2 = 0 – 42%). Overall, the summary estimate of odds ratios (ORs) and (95% confidence interval) showed greatest association of apolipoprotein genes (8.9; 1.6 – 75.9; P<0.001) with CVD, followed by lipoprotein genes (4.8; 0.9 – 38.6; P<0.029), eNOS gene (3.5; 0.8 – 23.6; P<0.015), MTHFR gene (2.9; 0.5 – 12.3; P<0.046) and CYP450 (3.1; 0.9 – 21.3; P<0.039) in the studied population. The adjusted odds for other factors showed that the impact is independent of sex and both - male and female show similar association. However the magnitude of association was found to vary with different allele. Herewith for the first time, we have successfully identified a set of candidate susceptible genes for the risk of CVD which are specific for the Indian phenotype.