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Cytokine gene variants and cyclo oxygenase expression in type 2 diabetes mellitus

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The onset and progression of type 2 diabetes mellitus (T2DM) result due to an alteration in cytokine levels, prostaglandin E2 (PGE2) and cyclooxygenases (COX). COX is responsible for PGE2 production and is regulated by inflammatory cytokines viz. IL-4, IL-13, and IL-10 while pro-inflammatory cytokines viz. IL-6 and TNF-α are differentially regulated by PGE2 and COX. Our objective was to study the association of selected gene variants viz. IL-4, IL-6, IL-10, TNF-α, COX2 and COX expression in T2DM. Blood samples from 1,157 subjects (717 controls and 440 cases) were collected for genotyping by polymerase chain reaction-restriction fragment length polymorphism (PCR-RFLP) after ethical approval and individual consent. Serum IL-10 level was measured by Enzyme Linked Immunosorbent Assay (ELISA). Genotypic and haplotypic analyses were performed by SPSS (v-21.0) and SHEsis (v-online). Expression analysis was performed by real time-PCR and data were analyzed using Prism software (v-5.0). VNTR (70bp) in IL-4-Intron3, 'GG' of IL-6-174G/C, TC' genotype of IL-10-819T/C, 'GG' of IL-10-1082A/G, and 'GG' of COX2+1195T/C showed significant association with T2DM ($P<0.01$). Individuals with haplotype 'TG' of *IL*-10-819T/C and -1082A/G, 'CG' of *IL*-6-174G/C and -597C/G showed 1-3 times higher risk of developing T2DM. Results showed significant increase of serum *IL*-10 levels in T2DM cases ($P<0.033$). COX1 and COX2 genes showed higher expression in T2DM as compared to controls (1.04, 1.034 folds respectively). 'TT' genotype of COX2+1195T/C showed 1.024 folds higher mRNA expression. Cytokine gene variants might help in revealing individual disease risk and understand the relation between cytokines and COX expression in T2DM.

Biography

Monisha Banerjee worked for PhD at Central Drug Research Institute and received degree from BHU, Varanasi. After a Post-doc tenure at Department of Medical Genetics, SGPGIMS, Lucknow, she joined as Assistant Professor at BHU in 2004. Presently she is Associate Professor at Lucknow University and she established the Molecular and Human Genetics Laboratory. Her research interests are molecular genetics of T2DM, cervical cancer and prenatal diagnosis. She has seven national projects to her credit and has published 60 papers in reputed journals. She has supervised 10 PhD students, is coordinator of genetics and genomics course and has other departmental responsibilities.

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