

Study on predisposing factors of type 2 diabetes mellitus

Priyanka Biswas Mukherjee* and Madhusnata De

*Vivekananda Institute of Medical Sciences, Ramakrishna Mission Seva Pratishthan,
Kolkata 700 026, India.*

***Corresponding author:** priyanbsws@yahoo.com

Introduction: Type 2 Diabetes Mellitus (T2DM) is a chronic progressive disease. There is increasing evidence that T2DM has been associated with elevated levels of DNA damage and a decreased efficacy of DNA repair causing genomic instability and consequently cancer. The frequency of Micro Nuclei (MN) has been mainly used as a biomarker to evaluate genotoxic risks in the environment. Oxidative Stress (OS) plays a critical role in the pathogenesis of both types of DM and its complications. OS causes oxidative degradation of lipids in cell membranes (lipid peroxidation) resulting in cell damage. In order to combat the cell damage, body has antioxidant property as a defence mechanism. Over production of ROS (OS) alters the OS biomarkers. Vascular Endothelial Growth Factor (VEGF) plays a key role in the pathogenesis of different complications of T2DM. Polymorphisms in VEGF gene contribute to the risk of diabetic complications.

Objectives: To determine lipid peroxidation and antioxidant (catalase) activities, frequency of MN and molecular analysis for diagnosis for the progression of diabetic complications in association with genetic polymorphisms in VEGF gene.

Methodology: Lipid peroxidation and catalase activity are assayed spectrophotometrically in both diabetic cases and non diabetic controls. The slides for MN analysis in buccal cells are stained with giemsa and scored randomly. DNA from peripheral blood are isolated and amplified by PCR followed by RFLP.

Results: Lipid peroxidation is higher than the catalase activity in diabetic samples rather than the non-diabetic controls. The frequency of MN is also elevated in diabetic samples. Polymorphisms in VEGF gene have been found in diabetic cases.

Discussion: Elevated lipid peroxidation than the catalase activity signifies increase in cellular susceptibility to oxidative stress. Increase in MN frequency in diabetic patients denotes a risk for causing cancer. Polymorphisms in VEGF gene state its association for the progression of late diabetic complications.

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