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Non enzymatic glycation of human serum albumin with D-glucose generates neo-epitopes deciphering immunological potential to generate antibodies in Diabetes mellitus and its associated complications

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Non-enzymatic glycation involves rearrangement and covalent attachment of reducing sugars to reactive residues in proteins. HSA incubated for 40 days forms advanced glycation end products (AGEs) that plays important role in progression of immunological complications. We present an approach using high pressure liquid chromatography, CHNS analysis, scanning electron microscopy, X-ray diffraction, fluorescence to identify AGEs that were further used as probe to detect antibodies in serum of diabetes mellitus patients with type 2 (T2DM), type 1(T1DM), gestational (GDM) and type 2 with chronic kidney disease (T2DM+CKD) with direct binding and inhibition ELISA. Affinity purified immunoglobulin G (IgG) further probe to determine specificity with direct binding and inhibition ELISA. Biophysical analysis of native and glycated HSA showed severe damage to its structure and function. High titre of antibodies and percent inhibition was found in following order T2DM+CKD>T2DM>GDM>T1DM compared to healthy. Similarly affinity purified IgG showed high specificity in following order T2DM+CKD>T2DM>GDM>T1DM compared to healthy. Glycation alters the structure and function of HSA that imparts the formation of neoepitopes, recognized as foreign bodies by immune cells and formed autoantibodies that prove to be novel biomarker for detection of immunological progressive complications associated with diabetes mellitus.

Biography

Alok Raghav is currently pursuing PhD in Endocrinology from Rajiv Gandhi Centre for Diabetes & Endocrinology, Aligarh Muslim University, Aligarh. He is also Senior Research Fellow at same University. During his PhD work he has published research paper in reputed journals. He is working on diabetes, protein glycation, chronic stress, beta cells dysfunction.

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