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Preferential recognition of Amadori-HSA by circulating antibodies in diabetes with or without nephropathy: Impact of protein glycation in the disease progression

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Objective: Diabetes mellitus (DM) is an autoimmune disease of complex aetiology and pathogenesis. In recent years, it has become evident that non-enzymatically modified human serum albumin (HSA) exerts a central role in the induction of autoimmunity. We investigated whether Amadori albumin is present in sera of healthy, diabetic and diabetic nephropathy patients and it is likely to be involved in the progression of diabetic nephropathy.

Methods: HSA was modified in-vitro by different concentrations of glucose to produce Amadori-HSA. The subjects were divided: Healthy, diabetic without complication, and diabetic nephropathy. Sera of diabetic patients with all groups were analyzed for auto-antibodies against native HSA and Amadori-HSA. Furthermore, binding characteristics and specificity of the auto-antibodies in patients were assessed by direct binding, inhibition enzyme-linked immunosorbent assay (ELISA), cross reactivity and band shift assay.

Results: Sera from control subjects contained almost negligible amounts of Amadori-HSA; lower levels were found in diabetic patients without complication in comparison to diabetic nephropathy patients where the level of Amadori-HSA was progressively higher. Enzyme-linked immunosorbant assay data exhibited preferential binding of Amadori albumin auto-antibodies to Amadori-HSA in comparison with native HSA.

Conclusion: The results suggest that glucose modification of self-antigen(s) can generate neo-antigenic epitopes that are better capable of inducing diabetes and diabetes nephropathy characteristic auto antibodies. The preferential binding of Amadori-HSA by auto antibodies derived from diabetic patient's sera indicates a role for it in initiation/progression of diabetic nephropathy.

Biography

Km Neelofar is a PhD student in Rajiv Gandhi Center for Diabetes and Endocrinology, F/O Medicine, Jawaharlal Nehru Medical College and Hospital, Aligarh Muslim University, Aligarh. Her research work is on diabetic nephropathy including biochemical, molecular and immunological aspects related to this. Her review article on Diabetic Nephropathy has been published in reputed journal and 2 research articles have been communicated.

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