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: "STUDY OF SERUM Ig A CONCENTRATION IN PATIENTS WITH TYPE 2 DIABETES MELLITUS AND CONTROL"

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ABSTRACT Diabetes Mellitus (DM) is a disease of absolute or relative insulin deficiency characterized by insufficient secretion of insulin by the pancreatic beta cells (type I) or decreased tissue response to insulin (type II). In diabetes, there is proliferation and swelling of endothelial cells, frequently obliterating the vessel lumen which leads to reduced blood flow and decrease in oxygen diffusion leads to good environment for the growth of microorganisms. The present study was carried out to evaluate the humoral immune status of controlled and uncontrolled type II diabetic patients by measuring the level of Serum Immunoglobulin A (Serum Ig A). For that blood samples from 7 controlled diabetes and 8 uncontrolled diabetes of type 2 were collected for measuring FBS, PPBS, Serum Ig A, Serum Creatinine, Blood Urea, Serum Sodium and Serum Potassium. Serum Ig A level was statistically significant in uncontrolled diabetes patients than controlled diabetes. So we can conclude that Serum Ig A is an important clinical parameter for monitoring diabetes and evaluating its secondary effects.

KEYWORDS : Diabetes Mellitus (DM), Serum Immunoglobulin A (Serum Ig A)

INTRODUCTION:

Diabetes Mellitus (DM) is a disease of absolute or relative insulin deficiency characterized by insufficient secretion of insulin by the pancreatic beta cells (type I) or subresponsiveness of tissue to circulating insulin (type II). In DM, there is proliferation and swelling of endothelial cells, frequently obliterating the vessel lumen which leads to reduced blood flow and decrease in oxygen diffusion. It provides better environment for the growth of anaerobes and thus increases susceptibility to infection.[1]

Serum immunoglobulins provide humoral immune status of individuals. Low immunoglobulin (Ig) levels some humoral immuno deficiencies. In contrast, high immunoglobulin levels (polyclonal gammopathy) are observed in liver diseases, chronic inflammatory diseases, haematological disorders, infections and malignancies.[2] An increase in serum Ig A levels is a generalized phenomenon in diabetic patients. [2] Being the second most common immuno globulin in human serum (after Ig G) and also the predominant immunoglobulin found in mucosal secretions, Ig A is the most studied and investigated immunoglobulin.[3]

The present study was undertaken with the aim of studying the humoral immune status of individuals having type II DM by measuring the serum Ig A level. To estimate the serum Ig A level in controlled and uncontrolled type 2 diabetes patients and compared its value in both the groups and its relation to secondary complication.

MATERIAL AND METHOD:

In the present study, 2cc venous blood of 15 known case of type II DM patients was drawn by using sterile disposable 22 gauge needle and sterile 5cc syringe and collected in sterile vaccute containing fluoride and oxalate. Out of 15 patients, 8 were known case of controlled diabetes and 7 were known case of uncontrolled diabetes. Blood sample of 5 controlled subjects were collected to measure serum Ig A and to compare its value with diabetes patients. Sample for fasting blood sugar (FBS) was collected in the morning and subjects were instructed not to take anything by mouth since previous midnight. Postmeal sample (PPBS) was collected approximately 2 hrs after a full meal. With post meal sample, sample for Serum IgA, Serum Creatinine, Blood Urea, Serum Sodium and Serum Potassium was collected. Serum Ig A was measured by commercial nephlometry assay.

RESULTS:

Table 1: Demographic detail of controlled subjects and patients with type 2 diabetes mellitus

	No of Subjects	Age(yr)		Sex		Duration (Yr)		
		41-50	51-60	Male	Female	1-4	5-8	9-12
Controlled	8	3	5	4	4	3	2	3
Uncontrolled	7	3	4	4	3	2	1	4

Table 1 showed demographic detail of subjects included in the present study. Total 15 numbers of known cases of type 2 diabetes in the age range of 41-50 and 51-60 years were included with written consent. Out of 8 controlled diabetes cases, 4 were male and 3 were female and out of 7 uncontrolled diabetes cases, 5 were male and 3 were female. Duration of diabetes was ranging from 1-4, 5-8 and 9-12 years.

Table 2: Biochemical parameters of patients studied

	FBS	PPBS	Serum IgA	Serum Creat-inine	Blood Urea	Serum Sodium	Serum Potassium
Controlled Diabetes	157.29 ±40.93	224.86 ±34.58	1.63±0.5	1.18±0.18	36.26± 10.97	133.87 ±1.97	4.16±0.34
Uncontrolled Diabetes	212.75 ±46.61	309.25 ±62.50	3.57±0.99	1.09±0.46	32.04± 14.29	133.19 ±3.66	4.23±0.71
P value	0.302	0.0075	0.0004	0.6341	0.5372	0.6641	0.81

Table 2 showed Mean ± SD of biochemical parameters such as FBS,

PPBS, Serum Ig A, Serum Creatinine, Blood Urea, Serum Sodium and Serum Potassium of controlled and uncontrolled diabetes.

Table 3: Co-relation of clinical complication in type 2 diabetes patients with serum Ig A

Clinical complications	Controlled Diabetes	Uncontrolled Diabetes	Serum IgA
Neuropathy	4	2	2.7047± 0.18312
Naphropathy	0	1	3.94
Retinopathy	0	1	2.157
Neuropathy, Naphroathy and/or Retinopathy	0	3	3.9533±0.9003
None	4	0	1.4515±0.6369

Table 3 showed co-relation of clinical complications such as neuropathy, nephropathy, and retinopathy with serum Ig A. 3 cases of uncontrolled diabetes were having 2 or more complications neuropathy, nephropathy and/or retinopathy. 4 cases of controlled diabetes were having none complication and remaining 4 were having neuropathy. None patients with uncontrolled diabetes were with complication.

DISCUSSION:-

Type 1 and Type 2 Diabetes Mellitus share a common metabolic dysfunction that involves abnormal regulation of both glucose and fat metabolism leading to hyperglycemia. Clinically, this often leads to renal and retinal damage, immune impairment, cardiovascular complication etc. It also affects neutrophil chemotaxis, phagocy tosis and adhesion.[4]

There are no specific or pathognomic oral manifestation associated with diabetes, however various oral conditions exacerbated in diabetes patients are gingival and periodontal disease, median rhomboid glossitis, oral candidiasis, localized osteitis and burning tongue. These might be due to altered immune response.[4]

Akinlade and his team in a study concluded that the test patients when compared to control group showed elevated level of serum IgM and IgA in Type 2 diabetes. It is evident that poor glycemic control may be associated with the increase in IgA. Studies conducted in 70's revealed that, insulin do not reflects any effect in Immunoglobulin level in Diabetics as there were no significant differences in immunoglobulin levels between insulin-treated and non-insulin-treated diabetic groups.[3]

In the present study, mean serum Ig A concentration of 5 controlled subjects was 1.8106; whereas mean serum Ig A of controlled diabetes was 1.63± 0.5 and of uncontrolled diabetes was 3.57± 0.99. Mean Serum Ig A was higher in uncontrolled diabetes than in controlled diabetes and it was statistically significant. The finding was similar to A. Gonzalez-Quintela et al, D Chaurasia et al, SR Segade et al, F Awartanl and in contrast to S Bhuyan et al.

Serum creatinine, blood urea, serum sodium and serum potassium were measure to detect renal complication. Neuropathy was recorded according to clinical signs. Patients were sent to eye hospital of our campus to detect retinopathy. All these clinical complications were more in uncontrolled diabetes than in controlled diabetes and mean serum Ig A was higher in the patients with clinical complications than in the patients having no complications. 4 Patients with no complications were controlled diabetes case and remaining 4 controlled diabetes patients have neuropathy only. mean serum Ig A concentration was highest in patients with 2 or more complications than with one single complication suggesting role of serum Ig A in chronic inflammation.

CONCLUSION :-

Serum Ig A is important clinical parameter to evaluate the progress of secondary complication.

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