JPAFP Journal Academy of Family Physicians Pakistan

Original Article

Relationship between Serum Albumin Levels and Micro albuminuria

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Abstract

Introduction: In patients with diabetes and hypertension, both microalbuminuria and serum albumin levels are linked to an increased risk of cardiovascular and renal illness. In Pakistan's huge general population, the relevance of micro albuminuria as a predictive protein biomarker of diabetic nephropathy and heart disease has not been studied, and its prognostic importance in people with existing diabetes is unclear.

Methodology: The authors assessed the relevance of the levels of microalbuminuria and serum albumin levels and looked at the relationship between the two in a Pakistani community based on the same number of men and women aged 40 to 79 who had and did not have prevalent baseline diabetes. From January 2014 to June 2014, samples were taken at the University of the Punjab's Health Centre Diabetic Clinic in Lahore.

Results: The samples were calculated using the recommended standard techniques, and the results were displayed in the form of tables and graphs. The gathered data were then subjected to statistical analysis.

Conclusion: In the general population, microalbuminuria and raised blood albumin levels may be helpful in identifying those who are more likely to develop diabetes, nephropathy, and eventually pass away.

Keywords: Micro albuminuria, protein biomarker, diabetes, Pakistan, nephropathy

How to cite this:

Ali M*et al.*, Relationship between Serum Albumin Levels and Micro albuminuria.J Acad Faml Phys Pak. 2017.10(2): 101-106.

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Introduction

Diabetes mellitus is a chronic condition caused by deficiencies in insulin secretion, action, or both. Hyperglycemia, frequently accompanied by glycosuria, polydipsia, and polyuria, is its defining feature.

One of the most significant long-term consequences of diabetes is diabetic nephropathy (DN).

Diabetes and chronic kidney disease patients are more likely to die from all causes, experience cardiovascular death, and develop renal failure. The finding of micro albuminuria is necessary for the clinical diagnosis of DN.

The water-soluble vitamin B9 is also known as folic acid, folate, vitamin M, vitamin B9, vitamin B (or folacin), pteroyl-L-glutamic acid, and pteroyl-L-glutamate. As seen in Figure 1, the aromatic pteridine ring of folate is connected to para-aminobenzoic acid and one or more glutamate residues. Although folic acid itself is not physiologically active, tetrahydrofolate and other derivatives that are produced after folic acid is converted to dihydrofolic acid in the liver provide folic acid its biological significance.

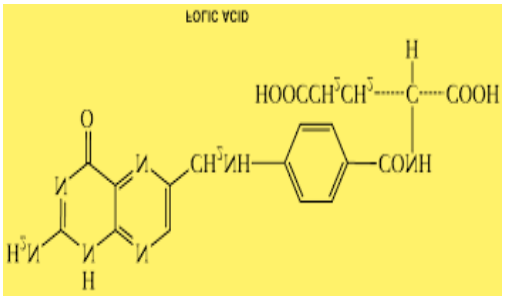


Fig 1: *folic acid*

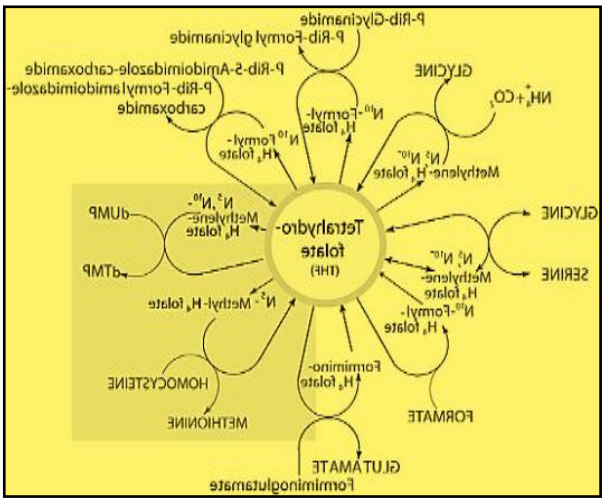


Fig 2: *folic acid metabolism*

Methods

Sample collection: Samples were taken between January 2014 and January 2015 at the University of the Punjab's Health Center Diabetic Clinic in Lahore.

Sampling Criteria: The equal number of men and women, aged 40 to 79, both with and without prevalent baseline diabetes, had their samples obtained.

Parameters: The patients' height, weight, and age were noted in the table, separately of diabetic patients and of controls. BMI of the patients was estimated using their weight and age. Each patient's blood sugar levels were noted.

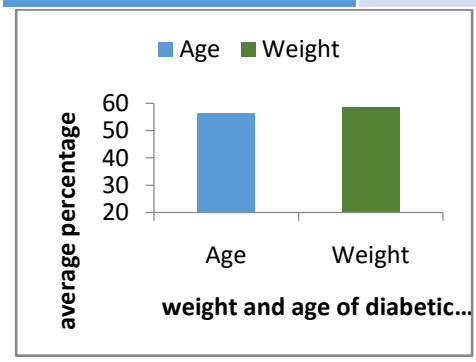
Family history for diabetes of the patients were recorded. HBA1C was estimated by using HBA1C ELISA. Biuret and Bradford assay was used for the estimation of protein in.

Results

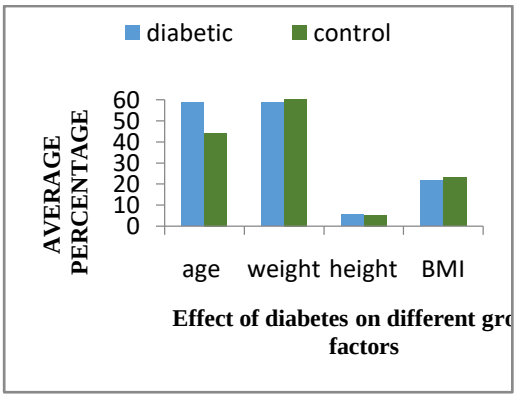
Table 1: *The Basic Biochemical Parameters in the control and diabetic Patients*

Parameters	Mean	Standard Error	Mean ± Std Error
Age(F)	52.222	1.58796	52.222±1.58796
(M)	59.1667	3.65943	59.1667±3.65943
Weight(F)	54.444	1.3515	54.444±1.3515
(M)	61.5833	3.43215	61.5833±3.43215
Height(F)	5.333	0.04410	5.333±0.04410
(M)	5.5667	0.04820	5.5667±0.04820
Sugar(F)	217.6667	30.65489	217.6667±30.65489
(M)	171.75	20.39130	171.75±20.39130
Cholesterol(F)	190.5536	17.7990	190.5536±17.7990
(M)	165.5	7.93869	165.5±7.93869
Triglycerides(F)	229.6667	70.48680	229.6667±70.48680
(M)	137.4167	16.09934	137.4167±16.09934
Hdl(F)	41.1111	0.75359	41.1111±0.75359
(M)	40.5	0.50000	40.5±0.5
Ldl(F)	113.000	10.39230	113.000±10.39230
(M)	96.6667	6.82501	96.6667±6.82501
Bilirubin(F)	0.53333	0.03727	0.53333±0.03727
(M)	0.5083	0.01486	0.5083±0.01486
Creatinine(F)	0.5	0.012	0.5±0.012
(M)	0.8	0.016	0.8±0.016
Alt(F)	30.8889	4.90873	30.8889±4.90873
(M)	33.6667	6.12908	33.6667±6.12908

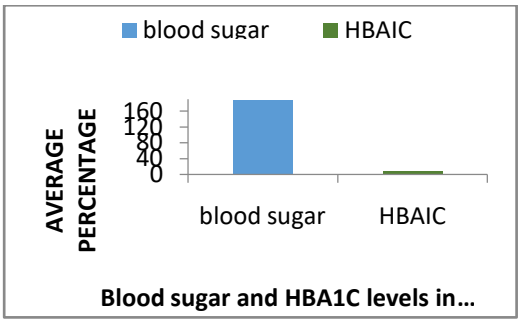
Alp(F)	180.1111	6.49668	180.1111±6.49668
(M)	186.75	7.17543	186.75±7.17543
Mau(F)	15.3333	1.30171	15.3333±1.30171
(M)	15.75	1.46228	15.75±1.46228
Hba1c(F)	9.1111	5.6210	9.1111±0.56210



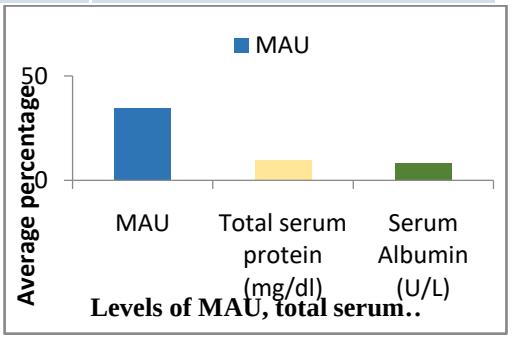
Graph 1: *graph of average percentages of age and weight of diabetic and non-diabetic persons.*



Graph 2: *Effect of diabetes on different age factors.*

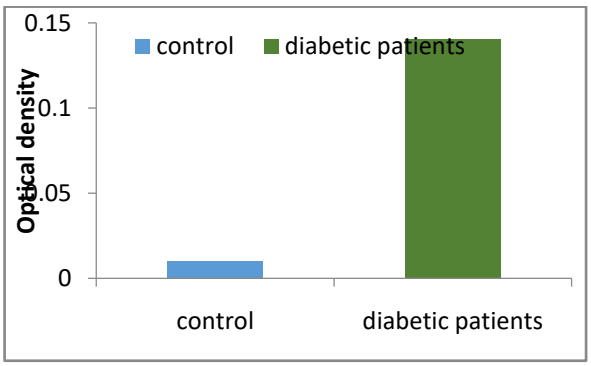


Graph 3: *Average percentage levels of HBA1C and blood sugar*



Graph 4: *Average percentages of serum proteins in diabetic and non diabetic persons.*

Fig 3: *Biuret test of different protein samples*



Graph 5: *Optical densities of the estimated proteins using Biuret method*

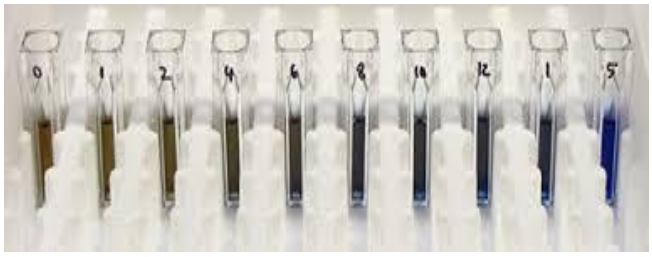


Fig 4: *Bradford method for estimation of proteins*

All the Biochemical parameters were estimated through the standard referred protocols. Micro albuminuria and serum albumin levels are elevated in diabetic patients as shown in figures and tables. Their Levels were down regulated in the non diabetic and normal groups. According to the WHO and IDF(2013) report 6.9 million people were diabetic in Pakistan and it could go up to 11.5 million in 2015.

There is need to control the Diabetes and should develop some strategies for the treatment of diabetes.

Conclusions

In the general population, microalbuminuria and raised blood albumin levels may be helpful in identifying those who are more likely to develop diabetes, nephropathy, and eventually pass away.

Acknowledgment

The project "Linkage of Micro albuminuria and Serum Albumin Levels in the Diabetic Patients of Punjab University Premises" was funded by University of the Punjab.

Conflict of interest: None

Funding Sources: University of the Punjab, Lahore

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