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Hyperuricemia, High Serum Urea and Hypoproteinemia are the Risk Factor for Diabetes

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Abstract: In India, diabetes is the most prevalent complication, according to the International Journal of Diabetes in developing Countries which labeled India the diabetes capital of the world. Currently, up to 11 per cent of India's urban population and 3 per cent of rural population above the age of 15 has diabetes This prospective study was conducted for investigation of the other disorder related with diabetes viz the level of serum total protein, serum uric acid and serum urea was analyzed in diabetic subjects (group I) and compare them with level of non obese non diabetic and normotensive volunteers selected as control (group II). The result revealed that all diabetic subjects has significantly higher blood urea level (t= df 58; $p<0.0001$) as compare to non diabetic subjects, significantly higher Uric acid level (t=8.79, df58; $p<0.0001$) as compare to non diabetic subjects and all diabetic subjects have significantly lower serum total protein level (t=62.23, df58; $p<0.0001$) as compare to non diabetic subjects. It was concluded that Hyperuricemia, Hyperuria and Hypoproteinemia are the risk factor for diabetes.

Key words: Diabetes, urea, protein, uric acid

INTRODUCTION

According to international journal of diabetes in developing countries, the international federation of diabetes estimated that number of diabetes patients in India more than double from 19 million in 1995 to 40.9 million in 2007 and for whole world diabetes is not a epidemic anymore but turn in to pandemic (WHO,1994). Diabetes mellitus arises when insufficient insulin is produced or when available insulin does not function correctly. Without insulin the amount of glucose in blood stream become abnormally high (Godkar and Godkar, 2003). Hyperuricemia-Uric acid is end product of purine metabolism, it is filtered in glamorous filtration and excreted in urine.Hyperuricemia is most commonly defined by serum uric acid concentration greater than 7 mg/dl in man and 6 mg/dl in women (Laster and Howell, 1963). For patients in type I diabetes, high serum uric acid may be the early sign of diabetes nephropathy before any significance change in urine albumin level (Tuomilchto *et al*., 1988). Hyperuria-urea is the one of the waste product excreted by the kidney and main end product of protein metabolism. An elevation of blood urea usually signifies decreased renal function. (Sakami and Harrington, 1963). Hypoproteinimia (or Hypoproteinemia) is a condition where there is an abnormally low level of protein in the blood. One common cause is due to excess protein in urine, which can be a medical sign of nephritic syndrome.(Hanoune *et al*.,1972)

MATERIALS AND METHODS

All experiments was done at laboratory of college of health science, Allahabad Agricultural deemed University Allahabad. About 5 ml of fasting blood from 50 diabetic patients was obtained by venipuncture from either male or female having age group 35-55 attending the different hospitals of Allahabad using sterilized disposable syringe. Same amount of blood was collected from the randomly select 20 non-diabetic subjects. The blood was put into centrifuge tubes; this was allotted to clot and then centrifuge at 3000 rpm for 15 min at room temperature. The serum obtained was pipette into clean blood sample and analyzed on the day of collection. The serum was analyzed for serum uric acid (Kabasakalian *et al*., 1973), serum urea (Beale and croft, 1961)and total protein (Guobing *et al*., 2001)

RESULTS AND DISCUSSION

Table 1 indicates all diabetic subjects has significantly higher uric acid level (t= df 58; $p<0.0001$) as compare to non diabetic subjects. Table 2 indicates all diabetics have higher blood Urea level (t=8.79, df58; $p<0.0001$) as compare to non diabetic subjects. This result is agreed with the finding of Dehghan A. *et al.* and Wun *et al*. Table 3 indicates all diabetic subjects have significantly lower serum total protein level (t=62.23, df58; $p<0.0001$) as compare to non diabetic subjects. These biochemical changes may be because patients

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Table 1: Mean ± SD of serum uric acid level among diabetic and non diabetics

Groups	N	Uric acid mg/dl
Diabetic (group I)	50	16.5±5.98
Non diabetic(group II)	20	5.4±0.45
P		< 0.001

Table 2: Mean ± SD of serum urea level among diabetic and non diabetics

Groups	N	Serum urea mg/dl
Diabetic (group I)	50	60.12±4.96
Non diabetic(group II)	20	34.8±1.45
P		< 0.001

Table 3: Mean ± SD of serum protein level among diabetic and non diabetics

Groups	N	erum total protein mg/dl
Diabetic (group I)	50	3.6±0.98
Non diabetic(group II)	20	7.3±1.24
P		< 0.001

having long term diabetes there is repression of glycolytic enzyme and depression of gluconeogenic enzyme which promotes gluconeogenes in liver, and further contributes to hyperglycemia. Due to continuous catabolism of amino acids high urea will be formed from urea cycle. On the other hand repression of glycolytic enzyme, glucose is channeled into pentose phosphate path way results in increased avibility of ribose 5 phosphate which leads to increase formation of PRPP ultimate result in high concentration of uric acid in blood. Hypoproteinemia condition may be occur because of long standing diabetes and can be a medical sign of nephrotic syndrome and cause of dialysis.

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