

2nd International Conference on Endocrinology

October 20-22, 2014 DoubleTree by Hilton Hotel Chicago-North Shore, USA

Serum electrolytes and uric acid levels in diabetic patients with renal failure in a tertiary hospital in North India

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Introduction: The WHO (2012) has recognized Diabetes Mellitus (DM) as a global epidemic with 10% prevalence in world population. One of the dreadful metabolic outcomes of DM is kidney damage, which can be associated with both electrolyte imbalance and altered uric acid levels. While serum sodium and potassium levels are indicative of metabolic derangement seen in DM patients, and are necessary for understanding disease pathogenesis and treatment plans, uric acid is believed to play a significant role in disease causation

Aims and objectives: The objective of our study was to compare and contrast serum sodium, potassium and uric acid levels between Type 2 DM patients with and without nephropathy.

Materials and methods: A cross-sectional study was conducted from September, 2012 to February, 2013 at a tertiary care hospital of north India. (n=64) Type 2 pre-treatment diabetic patients (FBS >200 mg%) were enrolled in the study. 25 patients with renal damage were included as cases (urea>50 mg/dl and proteinuria >300 mg/day) and 39 patients as controls (urea<50 mg/dl without proteinuria). Venous blood was collected from all patients and serum samples were analyzed for creatinine, uric acid, sodium and potassium.

Results: All cases (n=25) had significantly increased levels of serum creatinine (2.19 ± 2.4 mg/dl). Serum uric acid levels in the diabetic patients with kidney damage were significantly raised (8.68 ± 2.36 mg/dl) in comparison to controls (4.68 ± 1.88 mg/dl). There was evidence of hyponatremia (124.48 ± 4.99 meq/L) and hyperkalemia (5.97 ± 0.83 meq/L) in the patients with nephropathy.

Conclusion: Our study clearly establishes the significant electrolyte derangement in patients with diabetic nephropathy. Prospective research is warranted to understand the role of uric acid and electrolyte imbalance in pathophysiology of DM.

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