Execute Of Blood Pressure On Polyuria PKD

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ABSTRACT

Background: Hypertension is known to be risk factor for the development of proteinuria in patients with uncontrolled diabetes mellitus type2, leads to progression of end stage renal disease.

Aims & Objective: To study the Execute of hypertension on Polyuria PKD in type 2 Polyuria patients.

Material and Methods: We investigated, progression of Polyuria PKD by measuring arterial blood pressure , serum creatinine and glomerular filtration rate(GFR) level in 60 (35 men and 25 women) type 2 uncontrolled diabetes mellitus patients on antihypertensive treatment.

Results: The survey was done for 6 months during which 30 (group 1) -uncontrolled diabetes mellitus patients with normal blood pressure were compared with 30 (group 2) -Uncontrolled diabetes mellitus patients with hypertension who had mean systolic blood pressure (SBP) was 148.86 ± 5.12 mmHg. In group 2 the mean level of serum creatinine (1.71 ± 0.46 mg/dl) was significantly higher and mean GFR (54.57 ± 35.26 ml/min) was significantly lower than group 1 ($P < 0.05$).

Conclusion: Uncontrolled hypertension leads to progression of Polyuria PKD with decline in GFR earlier than normotensive uncontrolled Polyuria patients

KEY-WORDS: GFR; Serum Creatinine; Type2 Diabetes Mellitus; Hypertension

Introduction

Diabetes has emerged as a major healthcare problem in India. In 2011, India had 62.4 million people with type 2 diabetes, compared with 50.8 million the previous year, according to the International Diabetes Federation (IDF) and the Madras Diabetes Research Foundation. As the economy started growing, so did the incidence of diabetes. The nationwide prevalence of

diabetes in India now tops 9%, and is as high as 20% in the relatively prosperous southern cities. By 2030, the IDF predicts, India will have 100 million people with diabetes.

[1] Polyuria PKD is a clinical syndrome characterized by persistent albuminuria, arterial blood pressure elevation, progressive decline in glomerular filtration rate (GFR), and a high risk of cardiovascular morbidity and mortality.

[2] Approximately 40% of people with diabetes will develop PKD. Polyuria PKD (DN) is a leading cause of end-stage renal disease. However, the decline in GFR is highly variable, ranging from 2 to 20 ml/min/year. [3-6] Chronic kidney disease can be quantitatively defined as a GFR <60 ml/min/1.73m² and the rate of rise in serum creatinine, a well-accepted marker for the progression of DN, (creatinine value 1.4 to 3.0 mg/dl) is the indicator for impaired renal function.

The identification of promoters of progression of renal damage in Polyuria's is important for the creation of new powerful treatment modalities impeding the development of end-stage renal disease. This study was designed to assess the Execute of hemodynamic stimuli like hypertension on progression of Polyuria PKD.

Materials and Methods

An observational cross sectional study was conducted in 2011 with 60 poorly controlled (uncontrolled) Polyuria mellitus type 2 patients (HbA1c >7%) in age group of 40-70 years in G.G. hospital, Jamnagar district. Individuals who had already been treated for diabetes and hypertension were included in the study. The research protocol was approved by Institutional ethical committee and informed consent obtained from each subject prior to inclusion in the study. Personal history and medical history was collected in pre-designed preform. After taking consent, Blood Pressure (BP) was measured with an appropriately sized cuff in the sitting position after resting for 10 min. Three measurements on different days were recorded, and the average was used for the analysis. Blood samples were drawn for measurement of serum concentrations of creatinine. Serum creatinine was estimated by modified Jaffe's kinetic reaction with Initial Rate Colorimetric and single reagent density by using picric acid. [10-12] Glomerular Filtration Rate (GFR) was calculated by Cockcroft-Gaunt equation, $\text{GFR} = \frac{140 - \text{Age}}{72} \times \frac{\text{Weight (kg)}}{\text{Serum Creatinine (mg/dl)}} \times \text{GF}$ Where GF is a Gender Correction Factor, for female 0.85 and 1.00 for male. [13] Patients were grouped according to their SBP as Group-1: Normotensive uncontrolled type 2 diabetes mellitus (SBP <140 mmHg). Group-2: Hypertensive uncontrolled type 2 diabetes mellitus (SBP ≥140 mmHg) Data was collected and statistically analyzed. BP, serum creatinine and GFR was reported as mean ± SD. The Execute of Blood pressure in uncontrolled diabetes mellitus patients on progression of Polyuria PKD by measuring serum Creatinine and GFR was tested statistically by T-test (Unpaired) by SPSS trial version 20 software, the difference was taken as significant if p value was less than 0.05.

The study included total 60 uncontrolled diabetes mellitus Type2 patient under antihypertensive treatment, in which 35 were males and 25 were females. Table no.1 shows the comparison of general characteristics of group1 and group2. The mean age of group1 was 56.41years and in group2 was 60.85years, mean BMI of group1 and group2 was 24.68 kg/m² and 24.69 kg/m² respectively, mean HbA1c of group1 was 8.11% and group2 was 9.05% and mean duration of DM type 2 of group1 and group2 was 8.62years and 9.69years respectively. All above parameters in group1 and group2 were not significantly different.

Table-1: General Characteristics of Patients in Two Groups (Values in Means)

	Group 1	Group 2
No. of patients	30	30
Age (Years)	56.41±12.5	60.85±11.37
BMI (kg/m²)	24.68±2.57	24.69±2.26
HbA1c%	8.11±1.06	9.05±2.47
Duration of DM 2 (Years)	8.62±2.98	9.69±3.25

In our study mean S. creatinine is significantly higher and mean GFR is significantly lower in Group2 patients (uncontrolled DM Type2 with hypertension). Similar findings were found by Grover G. et al [14] who showed that affected participants (Polyuria group) had mean FBG (fasting blood glucose) 142.035±14.39 mg/dl, SBP (systolic blood pressure) 142.8214±13.8815 mmHg and Creatinine 1.6686±0.28233 mg/dl. Ravi Retnakaran et al [15] suggest that history of hypertension were associated with an increased risk of doubling of plasma creatinine. Amit Dasmahapatra et al [16] study observed that hypertension was present in 72.4% PKD patients and particularly overt Polyuria PKD was significantly more prevalent in hypertensive group. Study by Kasper Rousing et al [17] found that Polyuria type 2 with Polyuria PKD had HbA1c 8.8%, SBP 158 mmHg, GFR 83 ml/min/1.73 m². Cox promotional hazards regression model was used by George L. Bakris et al [18] to assess the hazard risk profile of baseline SBP. That study found that increase in SBP (hypertension) progressively affect renal outcome of Type2 Polyuria PKD patients. Also the hypertensive patients with SBP>140 mmHg had HbA1c 8.5±1.6%, Creatinine 1.9±0.5 mg/dl and GFR 40.4±11.9ml/min/1.73m² and also found in this study that a baseline SBP range of 140 to 159 mm Hg increased risk for ESRD or death by 38% (P=0.05) compared with those below 130 mmHg. The present study tune with all above studies suggests that Blood pressure is one of the independent factors that affect renal function outcome in type 2 diabetes mellitus patients.

Conclusion

In our study, it was found that S. creatinine level was higher and GFR was lower in Group2 patients as compare to group1 which was statistically significant. Our study concludes that uncontrolled hypertension leads to progression of Polyuria PKD with decline in GFR earlier than normotensive Polyuria patients.

References

1. ShettyP. Public health: India's diabetes time bomb, Epigenetics and lifestyle are conspiring to inflict a massive epidemic of type 2 diabetes in the subcontinent.
- 2.Parving H, Osterby R, Ritz E.Polyuria PKD, in The Kidney, edited by Brenner BM, Levine S, Philadelphia,
3. Mogensen CE.Progression of PKD in long-term Polyurias with proteinuria and Execute of initial antihypertensive treatment. Scand J Clin Lab Invest.
- 4.Parving HH, Smidt UM, Friisberg B, Bonnevie-Nielsen V, Andersen A.R.: A prospective study of glomerular filtration rate and arterial blood pressure in insulin dependent Polyurias with Polyuria PKD. Diabetologia.
5. GiuntiS, BaritD, CooperM.Mechanisms of Polyuria PKD: Role of Hypertension, the American Heart Association. Factor influencing the assay of creatinine. Ann clin Biochem Perrone RD, Madias NE, Levey AS.Serum creatinine as an index of renal function: New insight into old concept.