



Relationship of Night time Blood Pressure with Urine Microalbumin Creatinine Ratio in Non-CKD Patients

Authors

Dr Gosavi Siddharth¹, Dr Samarth Sangamesh², Dr Amogh Ananda Rao³

¹Postgraduate Resident, ²Senior Resident, ³Intern Medical Officer

Department of General Medicine, JJM Medical College Davangere -577004, India

Introduction

Increased excretion of urinary protein and a rise in nighttime blood pressure are strong markers of kidney damage. Random urinary microalbumin and microalbumin to creatinine ratio are early and sensitive predictors renal pathology. However, there is no significant information about the relationship between night-time blood pressure and albumin excretion. The aim of this study is to examine the relationship between nighttime BP and urine microalbumin to creatinine ratio in patients with either type 2 diabetes mellitus or hypertension, without any evidence of renal damage.

Materials and Methods

This was a prospective, cross-sectional hospital-based study, conducted over a duration of 2 months. Patients with either or both of type 2 diabetes mellitus and hypertension, with a normal GFR were included in the study. The exclusion criteria were patients with a diagnosis of chronic kidney disease, and other immunocompromised conditions. The study was started after obtaining a clearance from the Institutional Ethics Committee. 50 patients with a history of T2DM or hypertension were included in the sample. Their

blood pressure was measured at night before taking the medication. Blood investigations like blood urea and serum creatinine were performed along with urine analysis for random urine microalbumin and urine creatinine. The patients' demographic and personal history was also recorded and tabulated.

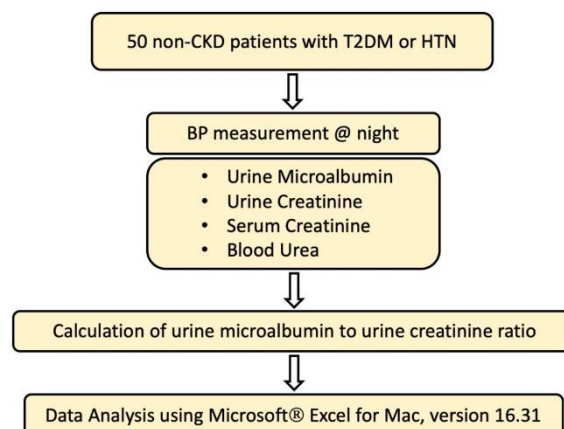


Figure 1: Methodology

Results

The sample consisted of 21 males and 39 females, with the average age being 54.3 years. The distribution of comorbidities is shown in figure 2. Thirty patients had diabetes mellitus as well as hypertension. Sixteen patients had only diabetes

mellitus and four of them had only hypertension. Eight out of fifty patients were

smokers and eleven out of fifty patients were alcoholics.

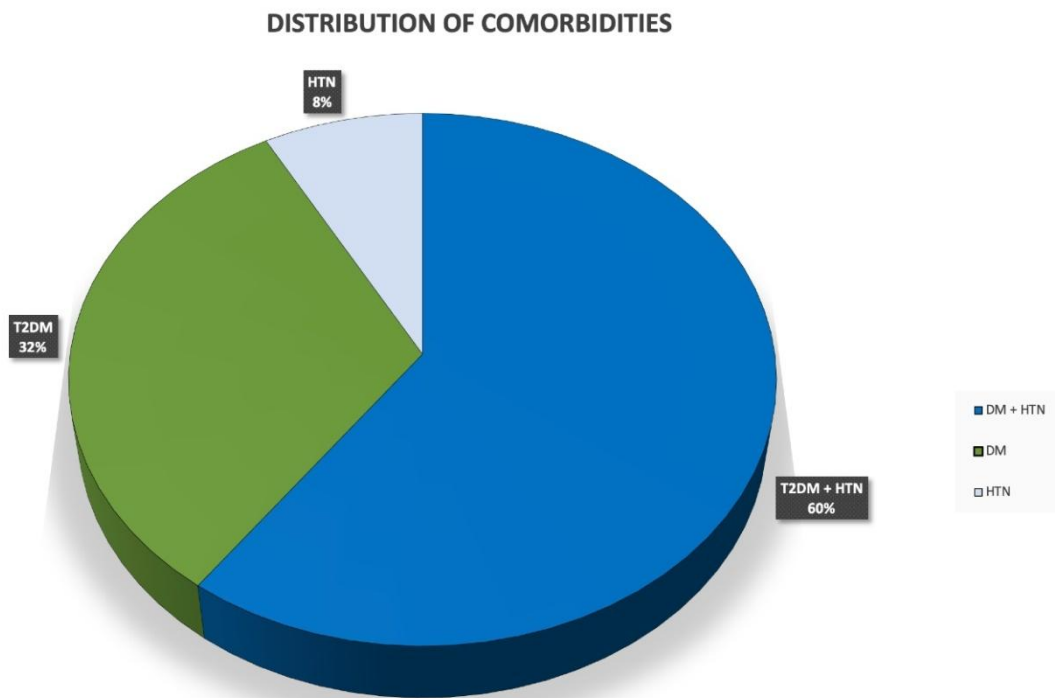


Figure 2: Distribution of Comorbidities

The mean night-time systolic BP was 152 mm of Hg and diastolic blood pressure was 88 mm of Hg. The mean blood urea was 28.5 mg/dL. The mean serum creatinine was 0.91 mg/dL and the urine creatinine was 67.13 mg/dL.

Linear regression analysis revealed positive correlation between both microalbumin creatinine

ratio and random urine microalbumin, and systolic and diastolic blood pressures (table 1). Nonetheless, the strongest correlation was observed between random urine microalbumin and night-time systolic blood pressure, with a p value of 0.00001. (Figure 3).

Table 1: Results of Linear Regression Analysis

| LINEAR REGRESSION ANALYSIS | | |
|-------------------------------|---------------------|----------------|
| PARAMETER | DEPENDENT VARIABLES | p VALUE |
| Microalbumin Creatinine Ratio | SBP | 0.005 |
| | DBP | 0.004 |
| | SBP & DBP | 0.01 |
| Random Urine Microalbumin | SBP | 0.00001 |
| | DBP | 0.001 |
| | SBP & DBP | 0.0001 |

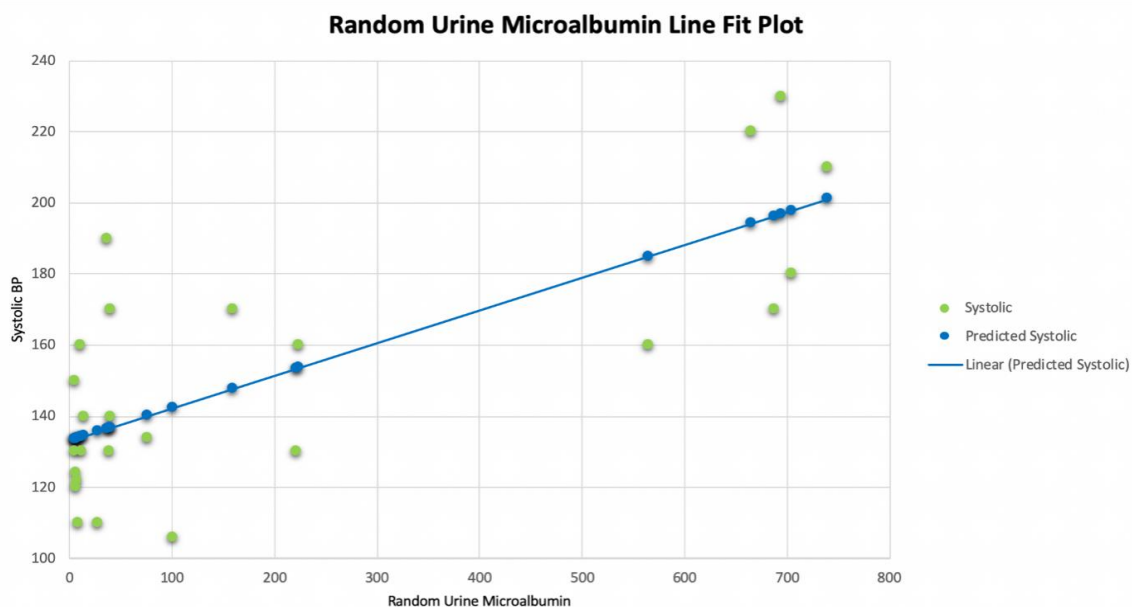


Figure 3: Line Fit Plot- Random Urine Microalbumin and Systolic BP

Discussion

Elevated night-time blood pressure is an important entity for the progression of chronic kidney disease but there is no significant data regarding the relationship of hypertensives in non-CKD patients. Thirty patients had both diabetes mellitus and hypertension. Sixteen patients had only diabetes mellitus and four patients suffered from only hypertension. High nocturnal blood pressure also increases the risk of microvascular damage. A strong positive correlation was obtained between systolic blood pressure and random urine microalbumin. The random urine microalbumin and microalbumin creatinine ratio increased with increasing night-time systolic and diastolic blood pressure.

Albuminuria is an important predictor of cardiovascular and renal events, hence urine microalbumin to creatinine ratio can be employed routinely in hypertensives and diabetics as a screening tool to detect impending developing chronic kidney disease

Conclusion

The urine microalbumin to creatinine ratio can be employed routinely in hypertensives and diabetics as a screening instrument for early detection of chronic kidney disease

References

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