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Blood pressure variability in diabetic patients with or without albuminuria

Zahra Davoudi¹, Majid Salmanian Mashhadi¹, Navid Mokhtari¹, Mehdi Sheibani¹

¹Clinical Research Development Center, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

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ABSTRACT

Introduction: Various studies considered albuminuria as one of the first asymptomatic paraclinical manifestation of the micro-vascular damages in type 2 diabetes mellitus (DM). Hypertension (HTN) is common in type 2 DM, which has a correlation with the greater risks of cardiovascular morbidity and death.

Objectives: The present research evaluated the relationship between blood pressure (BP) variability in diabetic patients who have or not albuminuria.

Patients and Methods: In this analytical-descriptive research, we divided 90 type 2 diabetic patients into two groups of micro-albuminuric (urinary albumin excretion ≥ 30 mg/d and < 300 mg/d) and the normo-albuminuric (urinary albumin excretion < 30 mg/d) diabetic patients. We evaluated systolic and diastolic BP and 24-hour Holter monitor BP and heart rate, with respect to their albuminuric states and glomerular filtration rate (GFR) stages.

Results: According to the findings, a considerably greater BMI (body mass index) and retinopathy was observed in microalbuminuric group in comparison with the normoalbuminuric group ($P < 0.05$). Additionally, non-dipping pattern was greater in the microalbuminuric patients ($P < 0.05$). In addition, patients were divided into dippers and non-dippers, the mean daytime and nighttime BP and heart rate were compared. Mean arterial BP (MAP) and nighttime BP and substantially in the subgroup of patients with GFR below 60 mL/min, systolic blood pressure (SBP) were considerably greater in the micro-albuminuric patients ($P < 0.05$).

Conclusion: In patients with diabetes, the existence of albuminuria is related to the increase in the incidence of non-dipping pattern compared with patients without albuminuria. According to high levels of SBP in albuminuric patients with low GFR, the pattern of HTN and then albuminuria and the subsequent reduction of renal function can be similar to that of type 1 DM patients. Moreover, 24-hour Holter monitoring and BP should be monitored closely in diabetic patients.

Implication for health policy/practice/research/medical education:

In this cross-sectional study on 90 diabetic patients, we found albuminuria is associated with non-dipper pattern of blood pressure compared with patients without albuminuria.

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Introduction

Hypertension (HTN) has been introduced as one of the key risk factors, both for the coronary artery disease and microvascular complications of diabetes (1). One of the early asymptomatic manifestations of the micro-vascular damages in diabetes is albuminuria which can lead to malfunction of glomerular filtration barriers (2).

Between patients with diabetes, the presence of kidney

damage markedly increases cardiovascular risk and health care costs (3). It has recently been indicated that changes in the blood pressure (BP) as well as the average BP possibly correlated with cardiovascular risks (4).

Studies in type 1 diabetic patients have shown that high SBP may occur earlier than microalbuminuria and suggested that nocturnal HTN may have a role in predicting individuals at risk for renal dysfunction (5).

*Corresponding author: Mehdi Sheibani, Email; m.sheibani@sbm.ac.ir

