

## Original Research Article

# A cross sectional study to assess the prevalence of microalbuminuria in patients with type 2 diabetes mellitus

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## ABSTRACT

**Background:** Microalbuminuria is an earliest marker of overt diabetic nephropathy, hence monitoring microalbuminuria in patients with diabetes mellitus helps to predict and prevent overt diabetic nephropathy. This cross-sectional study was done to find out the prevalence of microalbuminuria in 200 patients with diabetes mellitus attending medicine OPD of Basaweshwara medical college hospital (BMCH), Chitradurga.

**Methods:** 200 patients with Diabetes mellitus visiting the medicine OPD of BMCH, Chitradurga were considered for the study. Patients history and physical examination findings like duration of diabetes, hypertension, smoking and BMI were considered. Relevant blood investigations like fasting blood sugar, glycated haemoglobin (HbA1c), serum cholesterol and creatinine were done. Microalbuminuria was assessed using dipstick kits in an early morning urine samples.

**Results:** The prevalence of normoalbuminuria was 71% and microalbuminuria was 29%. The prevalence of microalbuminuria increased with the increase in duration of diabetes.

**Conclusions:** Prevalence of microalbuminuria among the patients with diabetes depends upon risk factors like blood pressure control, duration of diabetes, fasting blood sugar and HbA1c. Early identification of high risk patients and the subsequent initiation of renal and cardiovascular protective agents helps to reduce the burden of diabetic kidney disease.

**Keywords:** Diabetes mellitus, Diabetic nephropathy, HbA1c, Microalbuminuria

## INTRODUCTION

Diabetes mellitus is a common endocrine disorder globally and is characterized by insulin resistance, impaired insulin secretion, and increased glucose production.<sup>1</sup>

According to World Health Organization (WHO) there is an increase in the prevalence of diabetes worldwide particularly in developing countries and India has the largest number of diabetic.<sup>2,3</sup>

Type 2 diabetes mellitus is associated with significant morbidity and mortality mainly due to cardiovascular complications. Microvascular complications, such as diabetic nephropathy and retinopathy are common. Abnormal levels of urinary albumin excretion are seen in 30-40% of diabetics and is a commonest cause of end stage renal disease. Proteinuria is also an important marker of cardiovascular mortality.<sup>4</sup>

Hence in this study we report on the prevalence of microalbuminuria in 200 patients with type 2 Diabetes

mellitus who attend the outpatient of department of General Medicine at Basaweshwara medical college hospital and research centre over a period of 6months.

**METHODS**

Study was conducted on 200 patients with type 2 Diabetes mellitus who attend the outpatient of department of General Medicine at Basaweshwara medical college hospital and research centre over a period of 6 months (January 1<sup>st</sup> to June 30<sup>th</sup>, 2017). Patient’s history including age, sex, duration of the diabetes was taken. Height and weight and Body Mass Index (BMI) of all patients were calculated. Blood pressure was taken for all the patients for detection of hypertension. Blood was collected for fasting blood sugar, HbA1C, fasting lipid profile levels. Microalbuminuria was assessed using dipstick kits in early morning urine samples.

**Type of study**

Prospective observational study.

**Inclusion criteria**

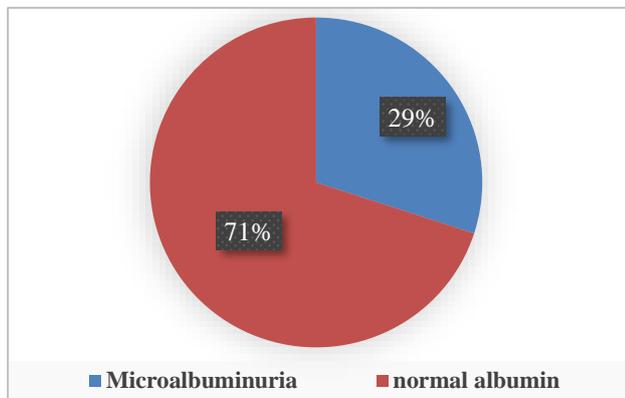
200 patients with type 2 Diabetes mellitus who attend the outpatient of department of General Medicine at Basaweshwara medical college hospital and research centre over a period of 6 months (January 1<sup>st</sup> to June 30<sup>th</sup> 2017) were included in the study.

**Exclusion criteria**

Patients with incomplete past records, urinary tract infection, or cardiac failure were excluded from the study.

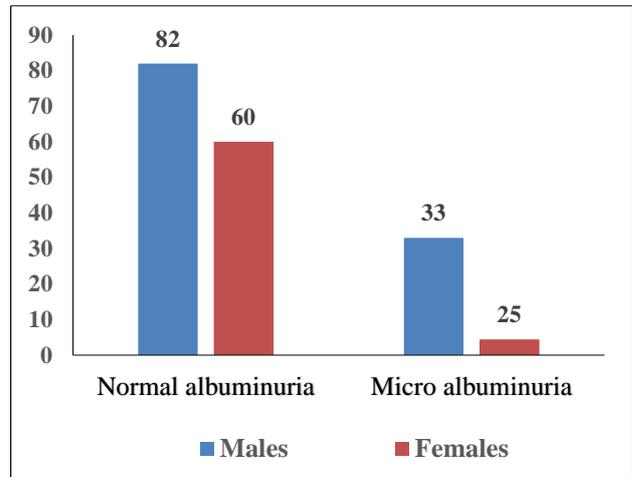
**RESULTS**

Out of the 200 patients, 71 % of the patients had normal albuminuria and 29% of them had microalbuminuria (Figure 1).



**Figure 1: 71 % of the patients had normal albuminuria and 29% of them had microalbuminuria.**

In our study male patients were more in both normoalbuminuria and microalbuminuria. 57% of the males had normoalbuminuria while 56% had microalbuminuria (Figure 2).



**Figure 2: 57% of the males had normoalbuminuria while 56% had microalbuminuria.**

Mean age of detection of diabetes among study population was in the early 40s, but the age when microalbuminuria was detected was a little higher. Body mass index was higher in patients with microalbuminuria.

Blood pressure was higher among the patients with microalbuminuria compared to normal albuminuria patients. In this study, the biochemical parameters were on the higher among microalbuminuria patients (Table 2).

Neuropathy was commonest complication in both group of patients followed by NPDR in patients with microalbuminuria (Table 3).

**Table 1: Demographic details of patients.**

	Normal albuminuria (n=142)	Microalbuminuria (n=58)
Age	45 years	53 years
Age at diagnosis	43 years	54years
Duration of DM	5 years	10 years
Body mass index	26.1	28.9

**Table 2: Other risk factors.**

	Normal albuminuria (n=142)	Microalbuminuria (n=58)
Systolic BP	122	138
Diastolic BP	78	92
Fasting blood sugar	115	188
HBA1C	6.2	8.2
Creatinine	1.0	1.4
Total cholesterol	172	233

## DISCUSSION

Incidence of diabetes mellitus has increased drastically over past decade.<sup>5</sup> Various studies have shown marked variation in the prevalence of microalbuminuria.<sup>6-10</sup> Especially Indians have a higher prevalence of microalbuminuria.<sup>8-10</sup> Microvascular complications such as nephropathy has also increase the prevalence of chronic kidney disease.<sup>11-14</sup>

In our study, the incidence of microalbuminuria was 29% with increased incidence in males compared to females. The average age of onset of diabetes was in the late 40's, while microalbuminuria was detected much later, in the early 50's.

Various studies have reported similar incidence of microalbuminuria in diabetes. Vijay et al showed incidence of 15.7% in Chennai.<sup>15</sup> Gupta et al from North India in his study reported an incidence of 26.5% microalbuminuria in patients with type 2 diabetic mellitus.<sup>16</sup> Globally, 16.8% in Saudi Arabia, 7-9% in UK, 31% in Mexican Americans was reported.<sup>17-20</sup>

In our study poor glycaemic control, duration of diabetes, hypertension, increasing age, high HbA1C are most important risk factors for microalbuminuria. Vijay et al have reported duration of diabetes, systolic and diastolic BP age and serum creatinine levels to be associated with proteinuria.<sup>15</sup> According to John et al, male gender, increasing age, duration of diabetes, poor glycaemic control and raised blood pressure was associated with microalbuminuria.<sup>21</sup>

In study conducted by Verghese et al, age, duration of diabetes, diastolic blood pressure, HbA1C, and fasting plasma glucose were reported to be the risk factors.<sup>22</sup>

## CONCLUSION

Prevalence of microalbuminuria was seen in patients with type 2 diabetes. Hypertension, raised HbA1C levels, high blood sugar levels and creatinine clearance levels are the major risk factors. Hence early detection of high risk patients and the early initiation of renal and cardiovascular protective agents helps in reducing morbidity and mortality due to type 2 diabetes mellites.

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