Original article:

Study of Assessment of Prevalence of Hypertension in Type 2 Diabetics Visited Medicine OPD at a Tertiary Care Hospital

Vijay Kumar

Assistant Professor, Department of General Medicine, Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

Corresponding Author: Dr. Vijay Kumar, Assistant Professor, Department of General Medicine, Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh, India.

ABSTRACT

Background: Diabetes is a complex metabolic disorder characterized by chronic hyperglycaemia, which leads to microvascular and macrovascular complications. Hypertension is a progressive CV syndrome arising from complex and interrelated etiologies. The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients.

Materials & Methods: A total of 100 patients with presence of type 2 diabetes were enrolled. Complete demographic details of all the patients were obtained. Blood samples were obtained from all the patients and were sent to the laboratory where biochemical and glycemic profile of all the patients was recorded. All the patients were recalled for three consecutive days and blood pressure was measured. The mean value of the three readings was taken and was considered as final value. Prevalence of hypertension was recorded. All the results were recorded in Microsoft excel sheet and were subjected to statistical analysis using SPSS software.

Results: A total of 100 type 2 diabetic patients were analyzed. The mean age of the patients was 45.6 years. Among these 100 patients, 59 were males while the remaining were females. Hypertension was seen in 45 percent of the patients. Significant results were obtained while correlating the HbAc1 levels with occurrence of hypertension.

Conclusion: An interrelation does exist among diabetes and hypertension. Careful monitoring of the risk factors of diabetes and hypertension should be done to decrease the morbidity associated with the disease.

Key words: Hypertension, Diabetes.

INTRODUCTION

Diabetes is a complex metabolic disorder characterized by chronic hyperglycaemia, which leads to microvascular and macrovascular complications. Hyperglycaemia arises because of relative or absolute insulin deficiency. Broadly speaking, diabetes can be divided into two categories – immune-mediated diabetes (type 1 diabetes) and non-immune-mediated diabetes (type 2 diabetes). In essence, such a definition characterizes type 2 diabetes as something it is not, rather than specifying a particular pathogenesis or another positive definition. In practice, it is sometimes difficult (and unnecessary) to differentiate between the two subtypes but the absence of a positive definition articulates the difficulty in describing type 2 diabetes simply and succinctly.[1-3]

Hypertension is a progressive CV syndrome arising from complex and interrelated etiologies. Early markers of

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the syndrome are often present before BP elevation is sustained; therefore, hypertension cannot be classified solely by discrete BP thresholds. Progression is strongly associated with functional and structural cardiac and vascular abnormalities that damage the heart, kidneys, brain, vasculature, and other organs and lead to premature morbidity and death. 7 Reduction of BP when target organ damage is demonstrable, or the functional precursor of target organ damage is present and still reversible generally reduces the risk for CV events.[4-6] The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients.

MATERIALS & METHODS

The present study was conducted in the Department of General Medicine, Santosh Medical College & Hospital, Ghaziabad, Uttar Pradesh (India) for assessing the prevalence of hypertension in type 2 DM patients. A total of 100 patients with presence of type 2 diabetes were enrolled. Complete demographic details of all the patients were obtained. Blood samples were obtained from all the patients and was sent to laboratory where biochemical and glycaemic profile of all the patients was recorded. Patients with history of any known cardiovascular pathology were excluded from the present study. All the patients were recalled on three consecutive days and blood pressure was measured. The mean value of the three readings was taken and was considered as final value. Prevalence of hypertension was recorded. All the results were recorded in Microsoft excel sheet and was subjected to statistical analysis using SPSS software.

RESULTS

A total of 100 type 2 diabetic patients were analyzed. mean age of the patients was 45.6 years. Among these 100 patients, 59 were males while the remaining were females. Hypertension was seen in 45 percent of the patients. Significant results were obtained while correlating the HbAc1 levels with occurrence of hypertension.

Table 1: Prevalence of hypertension

Hypertension	Number	Percentage
Present	45	45
Absent	55	55
Total	100	100

Table 2: Correlation of occurrence of hypertension with glycemic profile

Hypertension	Mean HbA1c levels	p-value
Present	11.9	0.002 (Significant)
Absent	9.8	

DISCUSSION

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. Several pathogenic processes are involved in the development of diabetes.

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These range from autoimmune destruction of the β-cells of the pancreas with consequent insulin deficiency to abnormalities that result in resistance to insulin action. The basis of the abnormalities in carbohydrate, fat, and protein metabolism in diabetes is deficient action of insulin on target tissues. Deficient insulin action results from inadequate insulin secretion and/or diminished tissue responses to insulin at one or more points in the complex pathways of hormone action.[7, 8] Impairment of insulin secretion and defects in insulin action frequently coexist in the same patient, and it is often unclear which abnormality, if either alone, is the primary cause of the hyperglycemia. Hypertension affects approximately 1 of 3 adults in the United States, and about 2 million new cases are diagnosed each year. An additional 28% of the US population is afflicted with prehypertension, and approximately 7% of Americans are not aware that they even have hypertension. Globally, hypertension affects more than 1 billion people and is projected to reach 1.56 billion by 2025. It is the leading cause of death and the second leading cause of lost disability-adjusted life-years worldwide.[9, 10] The present study was conducted for assessing the prevalence of hypertension in type 2 DM patients.

A total of 100 type 2 diabetic patients were analyzed. mean age of the patients was 45.6 years. Among these 100 patients, 59 were males while the remaining were females. Hypertension was seen in 45 percent of the patients. Significant results were obtained while correlating the HbAc1 levels with occurrence of hypertension. Over 90% of those living an average lifespan are estimated to develop hypertension, which is largely a reflection of sedentary behaviour, poor dietary habits and obesity. These lifestyles are often associated with other cardiovascular and health risks such as dyslipidemia and diabetes; hence, it is not surprising that many people have additional cardiovascular risks if they have hypertension. The majority of people with diabetes have hypertension and 17% of those with hypertension (blood pressure 140/90 mmHg or greater, or on treatment) have been diagnosed with diabetes. Most of the burden of disease is associated with type 2 diabetes.[11- 15]

Thomas MC et al estimated the frequency of hypertension and its management in consecutive clinic-based samples of patients with type 2 diabetes in Australian primary care. BP levels and antihypertensive management strategies were compared in patients with type 2 diabetes recruited as part of the Developing Education on Microalbuminuria for Awareness of reNal and cardiovascular risk in Diabetes (DEMAND) study in 2003 (n = 1831) and the National Evaluation of the Frequency of Renal impairment cO-existing with Non-insulin-dependent diabetes (NEFRON) study in 2005 (n = 3893). Systolic BP levels and the use of antihypertensive therapies were examined in patients with and without chronic kidney disease. The patient characteristics in both studies were similar in that more than 80% of patients in both studies were hypertensive. Systolic BP targets of < or =130 mmHg were achieved in approximately half of all treated patients in both studies. However, the use of antihypertensive therapy either alone or in combination increased from 70.4% in DEMAND to 79.5% in NEFRON 2 years later (P < 0.001). Despite this, antihypertensive therapy continued to be underutilized in high-risk groups, including in those with established chronic kidney disease. The DEMAND and NEFRON studies both show that BP control is achievable in Australian general practice, with more than half of all patients seeing their general practitioners achieving a target systolic BP < or =130 mmHg.[16]

K. Nørgaard et al et al assessed the prevalence of hypertension in a representative sample (n=10202) of the Danish general population aged 16–59 year. In Type 1 (insulin-dependent) diabetic patients of similar age (n=1703) the prevalence was determined in a similar way to 14.7% (p<0.00001). The excess prevalence in Type 1 diabetic patients was due to hypertension in patients with incipient and clinical nephropathy as the prevalence

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of hypertension among diabetic patients with normal urinary albumin excretion (essential hypertension) was 3.9%, similar to that observed in the general population. The patients with Type 1 diabetes and essential hypertension had higher systolic (146±19 vs 133±18 mmHg, p<0.00001) and diastolic blood pressure (87±12 vs 79±7mmHg, p<0.00001), but less changes in the eye background than patients with incipient nephropathy (urinary albumin excretion 30–300 mg/24 h) (p<0.03), indicating that the two groups were also different with respect to other microangiopathic lesions. Patients with essential hypertension were defined as having a normal urinary albumin excretion before and during antihypertensive treatment (if any). They were followed-up for a 58 (6–234) month period. They confirmed that hypertension is more common among Type 1 diabetic patients than in the general population and found the prevalence of essential hypertension similar in Type 1 diabetic patients to the non-diabetic population. This supports our hypothesis that hypertension is very unlikely to be the cause of diabetic nephropathy.[17]

CONCLUSION

An interrelation does exist among diabetes and hypertension. Careful monitoring of the risk factors of diabetes and hypertension should be done for decreasing the morbidity associated with the disease.

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