

# Hypertensive complications in diabetes mellitus patients at tertiary health care centre

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## Abstract

**Background:** Diabetes mellitus and Hypertension constitute major chunk of non communicable diseases. Association of these two major diseases leads to higher morbidity and mortality in population. **Aim And objective:** To study the hypertensive complications in type II diabetes mellitus patients at tertiary health care centre **Methodology:** Present study was carried out in 200 diabetic patients attending diabetic clinic at a tertiary health care centre. Data was collected with pre tested questionnaire. Data included sociodemographic data detailed history of patient, clinical examination and macrovascular and microvascular complications. **Results AND discussion:** Mean age of the patients was 48.21± 2.7 years. Male to female ratio was 1.2:1. Prevalence of hypertension in type II DM was 41.5%. As duration of diabetes increases prevalence of hypertension increases. Total 140 (70%) patients showed microvascular and macrovascular complications. Macrovascular complications were seen in 92 patients. Coronary artery disease and nephropathy were commonly observed complications in type II diabetic patients.

**Key Word:** Diabetes mellitus, Hypertension.

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## INTRODUCTION

Diabetes Mellitus is a metabolic disorder affecting multiple organ systems. It is characterized by chronic hyperglycemia with disturbances of carbohydrate, fat and protein metabolism. It results due to defects in insulin secretion or insulin action or both. In 2000, there were an estimated 175 million people with diabetes worldwide and by 2030, the projected estimate of diabetes is 354 million. Highest prevalence is predicted in the countries of the Middle Eastern Crescent, Sub-Saharan Africa and

the Indian subcontinent. By the year 2030, over 85 percent of the world's diabetic patients will be in developing countries. In India alone, the prevalence of diabetes is expected to increase from 31.7 million in 2000 to 79.4 million in 2030<sup>1</sup>. Risk factors for developing Type 2 diabetes are family history, central obesity, insulin resistance and life style changes due to urbanization. Ramachandran A *et al* found that asian Indians have other features of insulin resistance such as central obesity and high percentage of body fat in comparison to many other populations. They require higher levels of plasma insulin to maintain normoglycaemia<sup>2</sup> Various studies in different ethnic group show close association of diabetes mellitus and hypertension. Prevalence of HT is significantly higher in the patients with non insulin-dependent DM (NIDDM or type II DM). Hyperinsulinemia is the link between DM and hypertension.<sup>3</sup> The prevalence of Hypertension is 1.5–2.0 times more in those with DM than in those without DM<sup>4</sup>. Long standing diabetes mellitus is associated with an increased prevalence of micro-vascular and macro-vascular diseases. Macro vascular disease include coronary artery disease,

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cerebrovascular disease, peripheral vascular disease. Microvascular disease include neuropathy, nephropathy and retinopathy. These complications have higher morbidity and mortality. All above complications affect the physical health and quality of life of patients. so this study was conducted to see the hypertensive complications in type II diabetes mellitus patients.

### AIM AND OBJECTIVE

To study the hypertensive complications in type II diabetes mellitus patients at tertiary health care centre

### METHODOLOGY

Present study was carried out in 200 diabetic patients attending diabetic clinic at a tertiary health care centre. Inclusion criteria: 1. Patients diagnosed with type II diabetes mellitus at least for one year 2. Patients above 18 years Exclusion criteria: 1. Patients below 18 years 2. Patients not willing to participate in the study Study was approved by ethical committee. A written valid consent was taken from patients after explaining study to them. Data was collected with pre tested questionnaire. Data included sociodemographic data like age, sex. Detailed history of patient was taken. It included the duration of diabetes, mode of diagnosis and family history of diabetes. Through clinical examination was done. It included height, weight, and blood pressure. Blood pressure was recorded in sitting position in right arm with standard mercury sphygmomanometer with appropriate cuff size. Systolic blood pressure (SBP) was determined by the onset of the "tapping" Korotkoff sounds (K1) and fifth Korotkoff sound (K5), or the disappearance of Korotkoff sounds, was recorded as diastolic blood pressure (DBP). Hypertension was defined as average of three readings recorded 3 minutes apart on two separate occasions that are greater than or equal to SBP 140 and/or DBP 90 mm of Hg. Data regarding microvascular (neuropathy, nephropathy, retinopathy) and macrovascular (CAD,CVD,PVD) complications were noted. Data was analysed with appropriate statistical tests.

### RESULTS

We studied total 200 patients. Table 1 shows distribution of patients according to age group majority of the patients were in the age group of 51-60 years (35.5%) followed by 41-50 years (25%). Patients in age group of below 30 years and above 70 years were 2% and 4% respectively. Mean age of the patients was  $48.21 \pm 2.7$  years. In our study 55 % patients were male and 45% were females. Male to female ratio was 1.2:1. Table 2 shows distribution of diabetic patients according to their blood pressure. Out of total 200 patients 46 (23%) were having normal blood pressure. Pre hypertensive patients

contributed 35.5% of all. Stage I hypertension was seen in 57(28.5%) patients and stage II hypertension was seen in 26 (13%) patients. Table 3 shows distribution of patients according to Body Mass Index. Majority (35%) of the patients were with BMI 18.1-24.9 kg/m<sup>2</sup>. overweight patients (BMI 25-29.9kg/m<sup>2</sup>) and obese (BMI >30 kg/m<sup>2</sup>) were 33% and 30% respectively. We observed 83 (41.5%) patients had hypertension. Fig 1 shows prevalence of hypertension according to duration of diabetes in the patients. we found that as duration of diabetes increases prevalence of hypertension increases. During first five years prevalence was 11% and it increased to 25%, 27% and 37% every five yearly. We studied macrovascular and microvascular complications in these patients. Total 140 patients showed microvascular and macrovascular complications. Macrovascular complications were seen in 92 patients. It included coronary artery disease 64 (45.71%), cerebrovascular disease 09 (6.42%) and peripheral vascular disease 31(22.14%). Microvascular complications were seen in 48 patients. it included neuropathy 18 (12.86%), nephropathy 27 (19.28%) and retinopathy 13 (9.28%). Coronary artery disease and nephropathy were commonly observed complications in type II diabetic patients.

**Table 1:** Distribution of diabetic patients according to age group

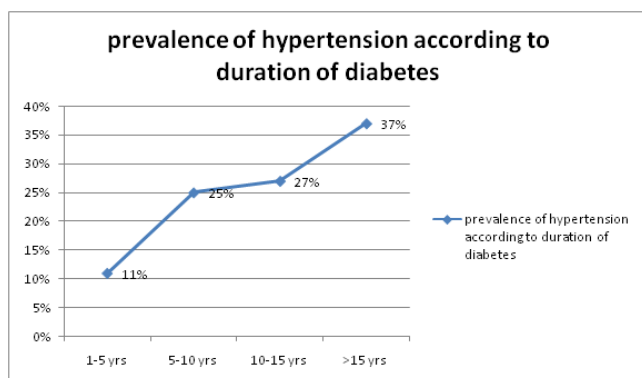
Sr. no	Age group	No of patients	Percentage
1	<30	04	2%
2	31 - 40	26	13%
3	41 - 50	50	25%
4	51 - 60	71	35.5%
5	61 - 70	41	20.5%
6	>70	08	4%
7	<b>Total</b>	<b>200</b>	<b>100%</b>

**Table 2:** Distribution of diabetic patients according to their blood pressure

Sr no.	Blood pressure	No. of patients	Percentage
1	Normal	46	23%
2	Pre - Hypertensive	71	35.5%
3	Stage - I	57	28.5%
4	Stage - II	26	13%
5	<b>Total</b>	<b>200</b>	<b>100%</b>

**Table 3:** Distribution of diabetic patients according to BMI (Body Mass Index)

Sr no.	BMI (kg /m <sup>2</sup> )	No. of patients	Percentage
1	<18	04	2%
2	18.1 - 24.9	70	35%
3	25 - 29.9	66	33%
4	>30	60	30%
5	<b>Total</b>	<b>200</b>	<b>100%</b>



**Figure 1:** Prevalence of hypertension in Type II diabetic patients according to duration of disease.

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