



THE PREVALENCE OF THE LONG TERM COMPLICATIONS OF TYPE 2 DIABETES MELLITUS AT THE TIME OF DIAGNOSIS

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ABSTRACT Diabetes mellitus is a significant health problem. Diabetes has traditionally been divided into Insulin-dependent (type 1) and non-insulin-dependent (Type 2) diabetes. Diabetes as a singular disease affects nearly all organ systems of the body. **OBJECTIVE:** The majority of diabetes burden is due to associated chronic complications that include retinopathy, nephropathy, neuropathy and cardiovascular disease. Studying prevalence of complications of diabetes gives opportunity to screen for complications and earlier treatment and prevention of progression. **RESULTS:** Out of 100 members 42% had one or more diabetes related long term complications at time of diagnosis. 40-60 year age group occupied 53%, >60 year age group 28% and 20-40 year age group occupied 19% of population. 40-60 year age compromised largest group in the study also largest group with complications.

KEYWORDS : Long term complications, Type 2 Diabetes Mellitus.

INTRODUCTION:

An epidemic of type 2 diabetes is occurring across the world, particularly affecting developing countries¹. Nowhere the diabetes epidemic more pronounced than in INDIA as WHO reports 35 million cases of diabetes in 2018, earning the name Diabetes capital of World². The prevalence of diabetes in all age groups worldwide was 2.8% in 2000 (171 million) and expected to rise 4.4% in 2030³. (366 million) Urbanization, industrialization, westernization and sedentary life styles lead to 10 times increase in prevalence within 30 years (1970-2000) in south India⁴. The natural history of diabetes leads to the development of chronic complications that include macrovascular complications like coronary heart disease, cerebrovascular disease and peripheral vascular disease; microvascular complications like nephropathy, neuropathy and retinopathy⁵. Macrovascular complications especially cardiovascular disease is very common and the most common cause of mortality and determine the prognosis. Peripheral vascular disease combined with neuropathy (diabetic foot disease) is commonest cause of amputations, disability and has large impact on health care costs⁶. Diabetic kidney disease is leading cause of end stage renal disease and diabetic eye disease is commonest cause of blindness in people below 65 years⁷. The prevalence of chronic complications varies widely in different studies and in south India prevalence of macrovascular complications was high at time of diagnosis⁸.

AIMS & OBJECTIVES

The majority of diabetes burden is due to associated chronic complications that include retinopathy, nephropathy, neuropathy and cardiovascular disease.

MATERIALS AND METHODS

This study was conducted at Gandhi hospital, Secunderabad in Department of medicine during period of 2016, March to 2017, March. 100 newly detected type 2 diabetes patients were recruited from those attending medical out-patient department and emergency department were included in this study.

These patients presented with various complaints, few with classical symptoms of diabetes and few with symptoms of diabetes related complications and others with inter-current illnesses.

INCLUSION CRITERIA

Newly detected type 2 diabetes mellitus

EXCLUSION CRITERIA

Type 1 diabetes mellitus, Gestational diabetes mellitus Type 2 diabetes

patients already on treatment

RESULTS

Percentage of study group presenting with and without complications

AGE and SEX DISTRIBUTION of POPULATION

	20-40yr	40-60yr	>60yr
Males with complications	4	12	7
Males without complications	7	17	8
Females with complications	3	10	6
Females without complications	5	14	7
Total	19	53	28

Total numbers of patients were 100, out of which 56 were male and 44 were female patients. Out of 100 members 42% had one or more diabetes related long term complications at time of diagnosis. 40-60 year age group occupied 53%, >60 year age group 28% and 20-40 year age group occupied 19% of population. 40-60 year age compromised largest group in the study also largest group with complications.

RISK FACTOR PROFILE IN DIABETIC PATIENTS WITH CORONARY ARTERY DISEASE

Category	Number (percentage)
Total prevalence	16/100 (16%)
Age in years	1/16 (6%)
20-40	10/16 (62%)
40-60	5/16 (31%)
>60	
Sex	9/16 (56%)
Male	7/16 (44%)
female	
Overweight/obesity	9/16 (56%)
Hypertension	8/16 (50%)
hypercholesterolemia	6/16 (37%)
Smoking	5/16 (31%)
HbA1C >7%	5/16 (31%)
Family history of diabetes	5/16 (31%)
Alcohol	4/16 (25%)
Hypertriglyceridemia	3/16 (18%)

Associated long term complications

Associated nephropathy	3/16 (18%)
Associated peripheral vascular disease	1/16 (6%)

Number of patients presenting with symptoms of coronary artery

disease; 12 (75%), Number of patients with ECG changes but no symptoms of CAD; 4 (25%).

ASSOCIATION OF COMPLICATIONS WITH HYPERTENSION IN TYPE 2 DIABETES

	Coronary artery diseases	Cerebrovascular Diseases	Peripheral vascular Diseases	NEURO	NEPHRO	RETINO
With HTN	8	4	2	5	6	3
Without HTN	8	5	3	7	4	2
P value	<0.0001,s	<0.0078,s	<0.09,ns	<0.0012,s	<0.0038,s	0.064,ns

Hypertension was very significantly associated with coronary heart disease. Hypertension was significantly associated with cerebrovascular disease, nephropathy and neuropathy. Hypertension was not significantly associated with peripheral vascular disease and retinopathy.

DISCUSSION

In this study 100 newly detected type 2 diabetes patients were evaluated for presence of chronic complications using screening tests that were validated in previous studies at the time of diagnosis. Comorbid conditions like hypertension, obesity, and dyslipidemias were also noted⁹

In this study out of 100 members 55% were male and 45% were female. 42% had complications related to diabetes at the time of diagnosis. (many studies have shown up to 50% people have chronic complications at time of diagnosis, UKPDS, fabre et al...). The overwhelming majority of diabetes morbidity and mortality is associated with chronic complications including retinopathy, neuropathy, nephropathy, peripheral vascular disease and cardiovascular disease.

Coronary artery disease prevalence was 16% in this study and males were more than females. Hypertension was associated with significantly with CAD. ($p < 0.0001$). Overweight/obesity (56%), hypertension (50%), hypercholesterolemia (37%) and nephropathy (30%) were associated comorbid conditions¹⁰. The prevalence of cerebrovascular disease was 9%. Males were more than females (55%/45%). The prevalence of PVD in CUPS was 4-6.7% using ABI as diagnostic criteria. Prevalence of retinopathy in UKPDS was 20-35%¹¹. All these studies used fundus photography to evaluate retinopathy that resulted in high prevalence. Overweight/obesity (56%), hypertension (50%), hypercholesterolemia (37%) and nephropathy (30%) were associated co-morbid conditions¹². The prevalence of cerebrovascular disease was 9%. Males were more than females (55%/45%). The prevalence is lower in Indian as compared to western countries. Nephropathy was present in 60% cases of retinopathy¹³.

Diabetic retinopathy was found in 5% of study group of which males were 60%. This is lower than prevalence reported by Mohan et al from Madras (7.4%) and ramchandran et al (6.7%)¹⁴.

This study sample may not represent the whole population but it has shown high prevalence of complications and hence chance for primary prevention¹⁵.

Through early detection by proper screening and early treatment impact of these long term complications can be modulated.

STUDY LIMITATIONS

The major limitation of the study was that it was conducted in small population that may not represent entire population.

The study was conducted from those population attending the hospital and thus may reflect high prevalence of complications observed in this study

Diabetes was diagnosed using ADA criteria only.

The gold standard Fundus photography was unavailable to evaluate retinopathy.

CONCLUSIONS

The prevalence of the long term complications of type 2 diabetes was

high at the time of diagnosis.

Coronary artery disease was the most common long term complication present at the time of diagnosis.

Diabetic neuropathy was the common micro-vascular complication at the time of diagnosis followed by diabetic nephropathy.

The prevalence of hypertension, obesity and smoking was high in patients with long term complications at the time of diagnosis.

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