

## Assessment of Type 2 Diabetes with Complications and Its Management in Tertiary Care Hospital, Calicut

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### ABSTRACT

**Background:** Studies about diabetes and its complications is important to reduce diabetes – related morbidity and mortality. Thus, this study was intended for assessing the complication of diabetes mellitus and its management strategy in a tertiary care hospital. **Objective:** To assess the demographic data of patients with diabetic complication and to assess the management of diabetic complication. **Methodology:** A prospective observational study conducted at PVS SUNRISE HOSPITAL, CALICUT. The necessary data were collected from patients' medical chart by using data collection form. The patients having diabetic complications, receiving any type of anti-diabetic medications were included in the study. **Results:** Out of 120 collected data 75 were male and 45 were females. The age gender wise distribution reveals that most of the complications were belong to men of age category 70-79. Hypertension is the mostly found diabetic complication and is managed by telmisartan and cilnidipine. **Conclusion:** Hypertension is found to be the most common diabetic complications. While the study didn't get any data related to diabetic retinopathy.

**Key words:** Type 2 Diabetes, Complications, Management

### I. INTRODUCTION

Diabetes mellitus (DM) describes a group of chronic metabolic disorders characterized by hyperglycemia that may result in long-term microvascular, macro vascular, and neuropathic complications.<sup>1</sup>

**TYPES OF DIABETES:** Type I Diabetes, Type II Diabetes, Gestational Diabetes Mellitus, Other Specific Type of Diabetes.

**TYPE 2 DIABETES MELLITUS:** Type 2 DM, previously referred to as adult-onset or noninsulin-dependent DM, is the most prevalent form of the disease and accounts for approximately 90% to 95% of all diagnosed cases. Patients are often asymptomatic; lethargy, polyuria, and polydipsia can be present.<sup>1</sup>

**DIAGNOSIS:** The recommended screening test is a fasting plasma glucose (FPG). Normal FPG level is less than 100mg/dl. Impaired fasting glucose is defined as FPG of 100 to 125 mg/dl.<sup>1</sup>

### II. MATERIALS AND METHODS

The study was conducted in PVS Sunrise Hospital, a multi-specialty tertiary care hospital in Calicut. A prospective observational study using patient medical records was used for the study. Diabetic patients with complications attending in the hospital were included in the study.

The necessary data were collected from patient medical charts by using the data collection forms. Study was carried out using medication orders within the study period. Case sheets of inpatients of various wards in the study site, literatures relevant to the study, data collection form were the materials used in this study. Data collection forms were used to record various complications, patient demographic data, and the drug therapy for diabetic complications. The study data was compiled in the excel sheet and the numerical and categorical variable were subjected to descriptive statistics.

### III. RESULTS AND DISCUSSION

A total of 120 patient's data were collected and analyzed during the study period from November 2022 to April 2023.

**DEMOGRAPHICS DATA OF THE PATIENTS  
 AGE WISE DISTRIBUTION**

The data of 120 diabetic patients were collected and analysed. The diabetic patients were

categorized into 6 age groups. Majority of the patients (30.83%) were in the age group of 70 -79 years.

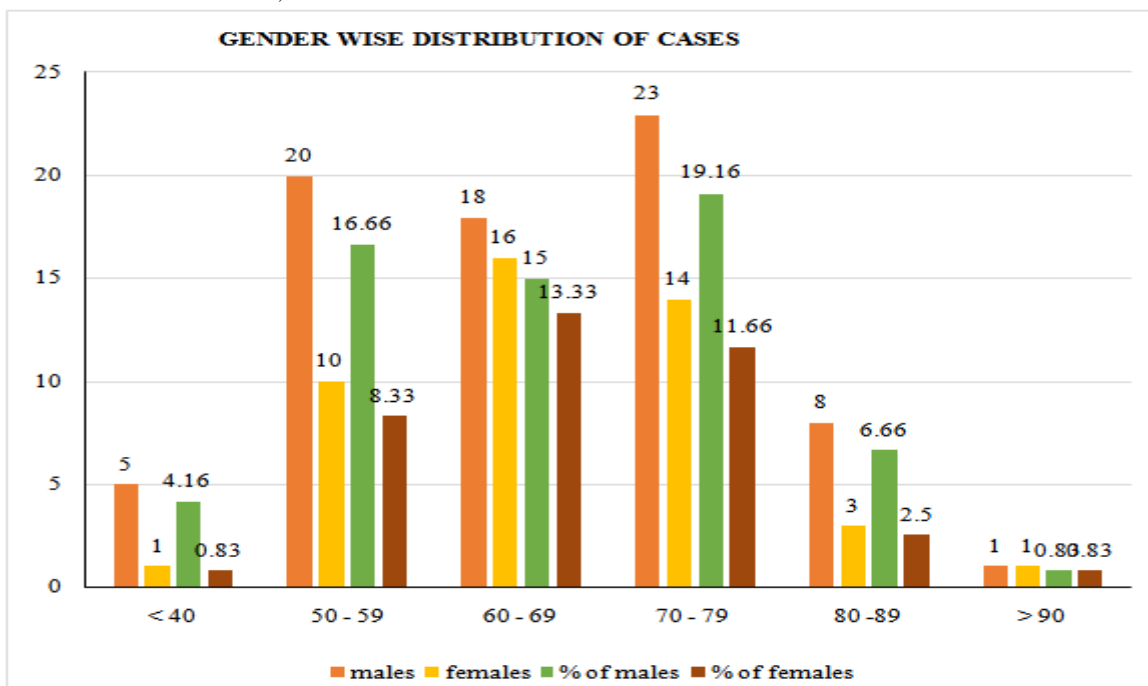
Sl. No.	Age	No of patients	% of distribution
1	40-49	6	5
2	50-59	30	25
3	60-69	34	28.3
4	70-79	37	30.83
5	80-89	11	9.16
6	90-100	2	1.6

**DISCUSSION:** Our study includes the patients from age group between 40-100 years. Age distribution reveals that 5% belongs to 40- 49 years followed by 25% belongs to 50-59 years followed by 28.3% belongs to 60-69 years followed by 30.83% belongs to 70-79 years followed by 9.16% belongs to 80-89 years followed by 1.6% belongs to 90-100years. This shows the most of the patient belongs to the category of middle old age (70-79). This result was similar to the study result of Anandkumar S. et.al., “Assessment on

complication of diabetes mellitus and its management strategy in a multispeciality hospital”.<sup>2</sup>

**GENDER WISE DISTRIBUTION**

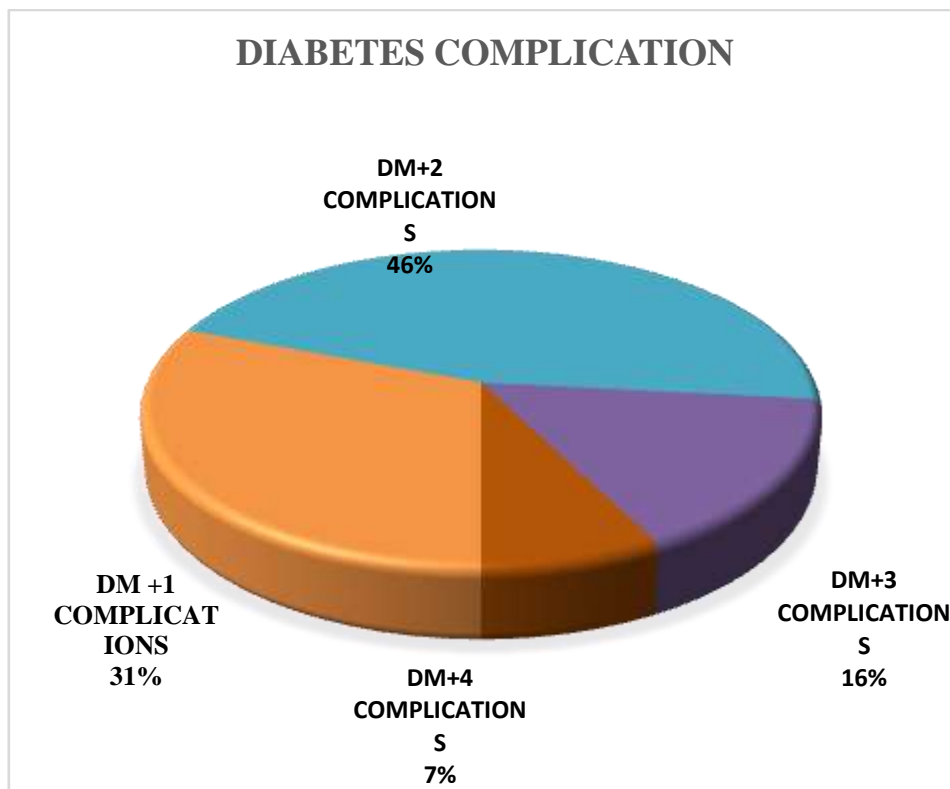
Among the 120 number of diabetic patients’ number of males and females of each group were also categorized. The gender analysis showed that 75 (62.5%) patients were male and 45 (37.5%) patients were female.



**DISCUSSION:** Our study includes 120 diabetic patients among that 75 were male and 45 were females. The diabetic complications were mostly found in males (62.5%) than females (37.5%). By analysing the age gender wise distribution most of the complications were belongs to 70-79 age

category of male (19.16%) and in females mostly found in 60-69 years (13.33%). The study result was similar to the study result of Lakshmi Narasimha Gupalli “Prospective and retrospective study of diabetes and its complications”.<sup>3</sup>

**DISTRIBUTION OF DIABETIC PATIENTS BY PRESENCE OF COMPLICATIONS**



**DISCUSSION:** By analysing the 120 diabetic patients, diabetes with two complications were present in 55 patients (45.83%). Diabetes with one complication were found in 37 patients (30.83%), diabetes with three complications were found in 19 patients (15.83%) and diabetes with four

complications were found in 9 patients (7.5%) correspondingly. The study result was similar to the study result of Ali Zaker, et.al., “Assessment of diabetes mellitus related complications in inpatients at a tertiary care hospital”, Baptist hospital, Bangalore.<sup>4</sup>

Sl. No	Complications	No. of patients	% Of distribution
1	Hypertension	92	76.6
2	Coronaryarterydisese	44	36.6
3	Stroke	37	30.8
4	DiabeticNephropathy	25	20.3
5	Diabetic foot	18	15
6	Diabetic Neuropathy	5	4.1
7	DiabeticRetinopathy	5	4.1
8	Dyslipidemia	5	4.2
9	Diabeticketoacidosis	2	1.67

**DISCUSSION:** By analysing the diabetic complications mostly found complication were hypertension in 92 patients (76.6%). The other complications which were present are coronary artery disease in 44 patients (36.6%), stroke in 37 patients (30.8%), chronic kidney disease in 25 patients (20.3%) and diabetic foot in 18 patients (15%). Neuropathy, retinopathy and dyslipidemia were found in 5 patients respectively (4.1%). The least found complication were ketoacidosis in 2

patients (1.67%). The study result was similar to the study result of AnandKumar S. et.al., “Assessment on complication of diabetes mellitus and its management strategy in a multi-speciality hospital”.

**DRUGS USED FOR THE TREATMENT OF DIABETES MEELITUS**

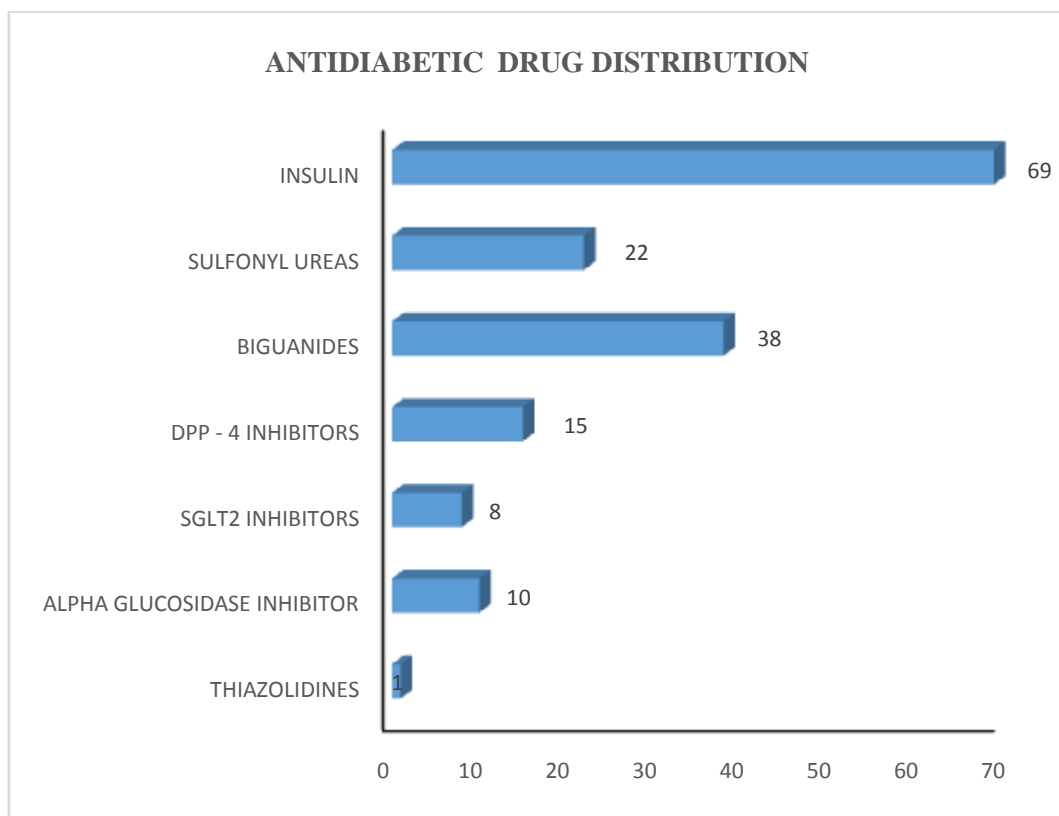
Prescribed antidiabetic drug in patients with diabetic complications were analysed.

Sl.no	Type of therapy	Number	Percentage
1	Monotherapy	47	39.16 %
2	Dual therapy	41	33.3 %
3	Triple therapy	20	16.66 %
4	Quadruple therapy	7	5.83 %
5	Quintuple therapy	5	4.16 %

**DISCUSSION:** While analysing the treatment of the patients, most of them receives monotherapy. That’s 48 patients (40%). 40 patients receive dual therapy (33.3%), 21 patients receive triple therapy (17.5%), 6 patients receive quadruple therapy (5%) and 5 patients receive quintuple therapy (4.16%).

The study result was similar to the study result of Dillip Kumar Mohapatraet.al., “Prescription pattern study of antidiabetic and antihypertensive drug to diabetic hypertensive patients in Vimsar, Burla, Sambalpur, Odisha”.<sup>5</sup>

**PATTERN OF ANTI-DIABETIC DRUGS DISTRIBUTION**



**PRESCRIPTION PATTERN OF COMBINATION DRUGS**

Sl. no	Class	No	%
1	Metformin + Vildagliptin	14	5.95
2	Metformin + Voglibose	5	2.12
3	Metformin + Glimepiride	23	9.78
4	Metformin + Sitagliptin	17	7.23
5	Metformin + Tenagliptin	5	2.12
6	Metformin + Dapagliflozin	3	1.27
7	Glimepiride + Tenagliptin	1	0.42
8	Dapagliflozin + Vildagliptin	1	0.42
9	Dapagliflozin + Sitagliptin	1	0.42
10	Metformin + Glimepiride + Pioglitazone	2	0.85
11	Metformin + Glimepiride + Voglibose	6	2.55

**DISCUSSION:** In this study insulin was mostly prescribed in 63 patients (26.80%) among that human insulin is mostly used. In case of oral hypoglycemic agents, biguanides was used in 38 patients (16.17%) followed by sulfonyl urease in 22 patients (9.36%) and DPP-4 inhibitors were used in 15 patients (6.38%) respectively. By analysing fixed drug combination, metformin and glimepiride combination were mostly used (23 patients (9.78%)). The study result was similar to the study result of AshutoshKakadeet.al., “Assessment of prescription pattern of antidiabetic patients in the out-patient department of a tertiary care hospital”.<sup>6</sup>

**TREATMENT OF DIABETES COMPLICATIONS**

Management of diabetes complication were analysed in 120 patients and the choice of therapy in each complication is as follows;

**Management of hypertension in diabetes patients**

In the treatment of hypertension in diabetes patients, telmisartan were prescribed to 34 patients which accounts to 21.9% followed by cilnidipine prescribe to 22 patients which correspond to 14.19%. The study result was similar to the study result of VanathiElenchezhiyanet.al., “Study of prescribing pattern of anti-hypertensive drugs in diabetic

patients in tertiary care centre Vizianagaram, India”.<sup>7</sup>

**Management of coronary artery disease in diabetes patients**

In treatment of coronary artery disease, antiplatelet drug was mostly prescribed in 30 patients (36.14%) followed by statins in 16 patients (19.27%). The study result was similar to the study result of Shruthi Dawalji et.al., “Prescription pattern in coronary artery disease: a prospective study”.<sup>8</sup>

**Management of stroke in diabetes patients**

In the present study, majority of the subject were treated with antiplatelet drugs in 39 patients (47.43%) in which clopidogrel were prescribed in 18 patients (21.9%). Also, citicoline a central nervous system agents were used in 13 patients (15.85%). The study result was similar to the study result of GargiDeyet.al., “A prospective observational study on prescribing pattern and outcome of acute stroke from a tertiary care hospital in Bangalore, India”.<sup>9</sup>

**Management of Nephropathy in diabetes patient**

The result of the study showed that people with diabetic nephropathy can be mostly treated with N-acetyl cysteine-taurine combination in 10 patients (41.67%). The study result was similar to

the study result of D. Padmini Devi “Diabetic nephropathy: prescription trends in tertiary care”.<sup>10</sup>

#### Management of diabetic foot in diabetes patients

The finding of our study shows that clindamycin was used in 7 patients were noticed for the management of bacterial infection in diabetic foot ulcer. The study result was similar to the study result of Athira Pillai V. et.al., “A study on prevalence and prescription pattern of diabetic foot ulcer”.<sup>11</sup>

#### Management of Neuropathy in diabetes patient

While analysing the study majority of patients treated with anti-convulsant(80%).The other choice of treatment was found to be thiamine derivative (20%). The study result was similar to the study result of Thomas Tolle et.al., “Painful diabetic neuropathy: a cross-sectional survey of health state impairment and treatment patterns”.<sup>12</sup>

### IV. SUMMARY AND CONCLUSION

The study was carried out to assess type 2 diabetes with complications and its management in tertiary care hospital, PVS Sunrise hospital, Calicut. Among the 120 patients, majority of them were males under 70 – 79 age categories. The result demonstrates that in various diabetic complications present in the hospital, mostly found complication were hypertension (76.6%), which is managed mostly by using telmisartan (21.9%) and clindipine (14.19%) along with the treatment of diabetes. The other complications include coronary artery disease (36.6%), stroke (30.8%), diabetic nephropathy (20.3%), diabetic foot (15%), diabetic neuropathy (5%), dyslipidemia (5%) and diabetic ketoacidosis (1.67%) respectively. Along with hypoglycemic agents’ anti-platelets are mostly used in the treatment of coronary artery disease (36.14%) and stroke (47.43%), N- acetyl cysteine- taurine combination for diabetic nephropathy (41.67%), clindamycin for diabetic foot (17.5%), anti-convulsant for diabetic neuropathy (80%), atorvastatin for dyslipidemia (100%) and insulin for diabetic ketoacidosis (100%) respectively. While the study didn’t get any data related to diabetic retinopathy. This study shows the necessity of early prevention and treatment of diabetes to prevent the complications and improve the quality of life in the patients.

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