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## LETTER TO THE EDITOR

### Drug Utilisation Study in Geriatric Type 2 Diabetic Patients

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#### Introduction

Drug utilisation has been defined as the marketing, distribution, prescription, and use of drugs in a society, with emphasis on the resulting medical and social consequences [1]. Drug utilisation studies create a sound sociomedical and health economic basis for healthcare decision-making [2]. Drug utilisation review (DUR) is the “evaluation of drug use in a given health care environment against predetermined criteria and standards to assess the appropriateness of drug therapy” [3]. Retrospective DUR involves evaluation of therapy and intervention when necessary, while the patient is receiving treatment.

Type 2 diabetes mellitus (T2DM) is one of the most common chronic conditions in the elderly, and its prevalence will increase as the population ages [4]. In India, 20% of the elderly population has T2DM [5]. The goals of treatment are the same for elderly and younger patients; however, treatment decisions are influenced by age, life expectancy, comorbid conditions, and severity of the vascular complications.

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Hypertension is an extremely common comorbid condition in diabetes, affecting ~20–60% of patients with diabetes, depending on obesity, ethnicity, and age. Hypertension substantially increases the risk of both macrovascular and microvascular diseases, retinopathy, nephropathy and possibly neuropathy [6]. Owing to the presence of comorbid conditions, geriatric patients are usually on more than one drug (polymedication). Hence, this vulnerable population needs frequent monitoring and special care.

#### Aim

This study was undertaken to evaluate the drug utilisation pattern in geriatric T2DM patients.

#### Materials and Methods

A retrospective longitudinal study was conducted for a period of 6 months (July 2004 to January 2005) in an out-patient department of a tertiary hospital in Mangalore, Karnataka, India. The medical records of 64 geriatric (age >60 years) [7] type 2 diabetic patients attending the diabetic clinic were reviewed. Drug prescribed mainly for DM and hypertension were included along with other drugs used for their comorbidities. Along with drug regimens, demographic data, age, and gender were recorded. The results were analysed using descriptive statistics.

#### Results

Prescriptions of total 64 geriatric T2DM patients were collected, out of which 42 (65.62%) were males and 22 (34.37%) females. Antidiabetic agents prescribed were second-generation

sulphonylureas, metformin, thiazolidinediones, and insulin.

Out of the total 64 patients, 46 (71.87%) were on polytherapy and 18 (28.13%) were on monotherapy for DM.

Out of 46 patients on polytherapy, 26 (40.63%) were on a two-drug combination, 18 (28.12%) on a three-drug combination, and two (3.12%) on a four-drug combinations.

Out of the total 64 patients, 48 (75%) were on a single oral antidiabetic agent (OAD) or a combination of OADs, 13 patients (20.31%) were on a combination of insulin and OAD, and remaining three patients (4.69%) were only on insulin therapy.

[Table/Fig 1] shows the pattern of antidiabetic drug utilisation in DM. Of the OAD, metformin

(78.12%) was the most frequently prescribed, followed by glimepiride (32.81%) and glibenclamide (31.25%). Insulin was prescribed for 25% of the patients (alone or in combination).

Out of the total 64 geriatric diabetic patients, 51 patients (79.68%) were on an antihypertensive therapy, and 47.045% were treated with a single antihypertensive drug and 52.94% with antihypertensive drug combinations. Among those who were treated with drug combinations, 31.37% received two drugs, 17.65% received three drugs, and 3.92% received a regimen of four drugs. The most frequently prescribed five antihypertensives were angiotensin converting enzyme inhibitors (ACEIs) – 54.09%, beta-blockers – 47.05%, calcium channel blockers (CCBs) – 37.25%, diuretics – 35.29%, and angiotensin receptor blockers (ARBs) – 19.6%.

**Table/Fig 1**  
**Antidiabetic drug utilisation**

Name	Number of patients (n = 64)	%*
Metformin	50	78.12
Glimepiride	21	32.81
Glibenclamide	20	31.25
Glipizide	08	12.50
Gliclazide	04	06.25
Thiazolidinedione	12	18.75
Insulin	16	25.00

\*Total exceeds 100%, since the average patients received more than one drug.

Among the ACEIs, enalapril (29.41%) was most frequently prescribed, followed by ramipril (23.53%) and lisinopril (1.96%). Of the beta-blockers, atenolol (23.53%) followed by metoprolol (19.60%) and carvedilol (3.92%) were the frequently prescribed antihypertensives.

Evidence of cardiovascular complications was found in 15 patients, neuropathy was present in

17 patients, and 13 patients had hyperlipidaemia. Drugs used for cardiovascular complications were nitrates (23.43%) and aspirin (42.18%) and for neuropathy was amitriptyline (26.56%); statins (20.31%) were used as hypolipidaemic agent.

**Discussion**

Prescription by a clinician may be taken as a reflection of his/her attitude to the disease and role of the drug in treatment. It also provides

insight into the nature of healthcare delivery system [8].

In elderly patients with type 2 diabetes, treatment may be initiated with monotherapy, followed by early intervention with a combination of oral agents, including a sulphonylurea as a foundation insulin secretagogue in addition to a supplemental insulin sensitiser [9]. Several studies showed that a combination of sulphonylurea with metformin has been most widely used [10]. The present study also showed that a combination of sulphonylurea and metformin was most frequently prescribed (75%). Metformin does not promote weight gain and has beneficial effects on several cardiovascular risk factors. Accordingly, metformin is widely regarded as the first drug of choice for most patients with T2DM [11]. Our study also supports the same; 78.12% received metformin alone and/or in combination with other OAD and/or insulin. At present, glibenclamide and glimepiride are the second-generation sulphonylureas most widely used in the United States [12]. In this study among the second-generation sulphonylureas, glimepiride and glibenclamide were most commonly prescribed. Adding a second agent is usually better than increasing the dosage of an agent that has already been given in a nearly maximum dosage. In some patients, three drug combinations may be useful. In this study, 40.63% received two drugs, and 15.62% received three-drug combination of only OAD. In most patients, the failure of three oral agents used together calls for the use of insulin alone or in addition to an oral agent. Numerous studies have shown that a combination of insulin and sulphonylurea is more effective than insulin alone in the treatment of patients with T2DM after secondary failure to oral drugs, leading to better glucose profiles and/or decreased insulin needs [13]. The present study shows that only 4.68% received insulin alone and 20.31% received insulin in combination with OAD.

The benefits of treating hypertension in elderly diabetic patients are to achieve reductions in cardiovascular morbidity and mortality. There are numerous studies documenting the effectiveness of ACEIs in retarding the development and progression of diabetic nephropathy and macro- and microvascular complications. Hence, choosing an ACEI as the

first-line agent in most patients with diabetes is reasonable [14]. The present study also showed that ACEIs were the frequently prescribed antihypertensive agents (54.90%). The recent UK prospective diabetes study group report indicated that more than 25% of hypertensive patients with diabetes require three or more antihypertensive drugs [15]. In our study, 31.37% received two drugs and 17.65% received three-drug combinations.

Coronary heart disease (CHD) is one of the major causes of death in elderly diabetics [16]. In our study, 23.43% showed presence of cardiovascular complications other than hypertension and drugs used were nitrates (23.43%) and aspirin (42.18%).

Neuropathy is the most common symptomatic chronic complication in diabetic patient and accounts for substantial morbidity in elderly diabetic population. Chronic, painful diabetic neuropathy is difficult to treat but may respond to tricyclic antidepressants (amitriptyline) and other agents (phenytoin) [17]. Current study shows that 27.86% of diabetics received amitriptyline for neuropathy.

To conclude, T2DM is a progressive and complex disorder that is difficult to treat effectively in the long term. The treatment pattern observed in this study corroborates with the accepted pattern of treatment for DM with hypertension, CAD, and/or neuropathy. Metformin, glimepiride, and glibenclamide are most commonly prescribed OADs. Enalapril and ramipril among the ACEIs and atenolol and metoprolol among the beta-blockers are the frequently prescribed antihypertensives.

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