Prescription preference of antidiabetic drugs among clinicians

Dr. Sayan Das, Dr. AV Tilak, Dr. Nimish Narkar, Dr. Suresh Dange, Dr. BT Rane and Dr. Shrikrishna Shende

Abstract

Introduction: Diabetes mellitus (DM) refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia. The increased numbers of choices for treatment of DM have often left the practitioners without a clear pathway of therapy to follow. A practitioner cannot blindly follow a single protocol adapted from some guidelines. Thus, a prescription pattern among clinicians in Pimpri, Pune.

Aim & Objectives
- To study the overall utilization of various available therapies for diabetes mellitus
- To study the utilization pattern between monotherapy and combined therapies

Material & Methods: A cross sectional observational study for a period of 6 months among 100 clinicians/practitioners who treat patients of type 2 diabetes mellitus (T2DM) in Pimpri, Pune. It was a questionnaire based study. Institutional Ethics Committee (IEC) clearance was obtained before the start of the study. Written informed consent was obtained from all the subjects before participation and the questionnaire was provided to be filled by them.

Results: Overall metformin was the most preferred prescribed anti diabetic agent followed by sulphonylureas, thiazolidinediones, α-glucosidase inhibitors and dipeptidyl peptidase 4 inhibitors. Metformin + sulphonylureas is the most preferred combination therapy. The most preferred insulin preparations are insulin mixtard (30/70). The practitioners preferred a double drug therapy over monotherapy or a triple drug therapy for treatment of type 2 diabetes mellitus patients.

Keywords: Diabetes, prescription pattern, drug utilisation study, metformin, pune, T2DM

Introduction

Diabetes mellitus refers to a group of common metabolic disorders that share the phenotype of hyperglycaemia. Factors contributing to hyperglycaemia seen in diabetes mellitus include reduced insulin secretion, decrease glucose utilization or increased glucose production [1]. According to the International Diabetes Federation (IDF), diabetes mellitus is one of the leading causes of morbidity and mortality worldwide. In addition to the 415 million adults who are estimated to currently have diabetes, there are 318 million adults with impaired glucose tolerance, which puts them at high risk of developing the disease in the future. This is projected to increase to 642 million by the year 2040. With an estimated 69.1 million people living with diabetes in India, corresponding to 8.7% of India’s adult population, India has the world’s second largest diabetes population [2].

Currently, the management of diabetes mellitus include, insulin, oral glucose lowering agents like sulphonylureas, biguanides, thiazolinedinediones, glinides, α-glucosidase inhibitors, dipeptidyl peptidase iv (DPP-4) inhibitors, and sodium glucose co-transporter 2 (SGLT-2) inhibitors, and parenteral drugs like amylin agonists and glucagon like peptide 1(GLP-1) receptor agonists. The increased numbers of choices for treatment of diabetes mellitus have often left the practitioners without a clear pathway of therapy to follow. Moreover, each of these classes of drugs has some limitations like hypoglycaemia, weight gain, peripheral oedema, abdominal discomfort etc. Looking at these facts, one can safely conclude that one cannot blindly follow an iron-clad protocol adapted from some fancily named guidelines for treating each and every case. On the contrary, the treatment of diabetes mellitus should be custom made for individuals and be dynamic in nature with lots of scope for change as per needs.

Therefore, this study is a survey to evaluate the current prescribing pattern of anti-diabetic drugs in diabetic patients attending clinics in Pimpri, Maharashtra.
AIM & objectives
- To study the overall utilization of various available therapies for diabetes mellitus
- To study the utilization pattern between monotherapy and combined therapies

Methodology
Institutional Ethics Committee (IEC) clearance was obtained before the start of the study. The study was conducted as a cross sectional observational study for a period of 6 months among clinicians/practitioners who treat patients of type 2 diabetes mellitus (T2DM) in Pimpri, Pune. Sample size was 100 and the inclusion & exclusion criteria were as follows:

Inclusion criteria
- Practitioners who treat type 2 diabetic patients
- Registered Practitioners (Allopathy)

Exclusion criteria
- Practitioners who don’t treat type 2 diabetic patients
- Practitioners unwilling to participate in the study

Written informed consent was obtained from all the subjects before participation and then a questionnaire was provided to the practitioners were filled by them instantly. The practitioners surveyed had a mean age of 36.08 ± 6.54 years. 27% of the doctors were M.B.B.S. graduates, whereas 68% of the doctors were M.B.B.S. and M.D., and only 5% of the doctors have completed M.B.B.S, M.D., and D.M. in Endocrinology.

The most common age group of patients with diabetes mellitus treated by 69% of practitioners was between 46 years and 60 years. Also, 66% of the doctors said that there is a female prevalence of diabetes mellitus among the patients treated by them.

It was observed that 64% of the doctors preferred only lifestyle modifications as the first line of treatment. Lifestyle modifications included both diet management and regular physical exercise. Whereas, 36% of the doctors preferred a combined therapy of lifestyle modifications along with a single drug treatment. Among the 36% of the doctors who preferred a combined therapy, 58.33% of the doctors preferred metformin (biguanides) as the choice of antidiabetic drug for the first line of treatment.

Table 1: Demographic parameters of practitioners included in the study

<table>
<thead>
<tr>
<th>Parameters</th>
<th>Values</th>
</tr>
</thead>
<tbody>
<tr>
<td>Age (in years)</td>
<td>36.08 ± 6.54</td>
</tr>
<tr>
<td>Sex</td>
<td></td>
</tr>
<tr>
<td>Male</td>
<td>84 (84%)</td>
</tr>
<tr>
<td>Females</td>
<td>16 (16%)</td>
</tr>
<tr>
<td>Medical education</td>
<td></td>
</tr>
<tr>
<td>M.B.B.S.</td>
<td>27 (27%)</td>
</tr>
<tr>
<td>M.D.</td>
<td>68 (68%)</td>
</tr>
<tr>
<td>D.M.</td>
<td>5 (5%)</td>
</tr>
<tr>
<td>Duration of medical practice</td>
<td></td>
</tr>
<tr>
<td>&lt; 2 years</td>
<td>12 (12%)</td>
</tr>
<tr>
<td>2 – 5 years</td>
<td>24 (24%)</td>
</tr>
<tr>
<td>5 – 10 years</td>
<td>28 (28%)</td>
</tr>
<tr>
<td>&gt; 10 years</td>
<td>36 (36%)</td>
</tr>
</tbody>
</table>

The most common oral antidiabetic drugs used by clinicians...
The Pharma Innovation Journal

interviewed were biguanides/metformin (43.4%), followed by sulphonylureas (39.6%), thiazolidinediones (7.5%), α-glucosidase inhibitors (5.8%) and dipeptidyl peptidase iv (DPP-4) inhibitors (3.7%).

Clinicians most commonly prescribed a double therapy (53%) followed by monotherapy (34%) and finally a triple drug therapy (13%).

The most frequently prescribed combination of antidiabetic drugs including injectables by the clinicians interviewed was a combination of metformin and sulphonylureas (32.4%), followed by metformin and insulin (26.8%), then a sulphonylureas and pioglitazone/thiazolidinediones (11.3%), a combination of metformin + sulphonylureas + insulin (11.3%), which was followed by sulphonylureas and α-glucosidase inhibitors (7%) and a combination of sulphonylureas + metformin + α-glucosidase inhibitors (7%) and least commonly a triple drug combination of sulphonylureas + metformin + α-glucosidase inhibitors (4.2%).

The most commonly preferred insulin preparation by the practitioners/clinicians was insulin mixtard (30/70) by 56% of the practitioners. Insulin mixtard (30/70) is a combination of 30% soluble and 70% isophane insulin. It was followed by short acting insulin / Actrapid insulin by 24% of the practitioners, and long acting insulin by 8% of the practitioners and a combination of short acting insulin (Actrapid insulin) and a long acting insulin by 12% of the practitioners in Pimpri, Maharashtra.

The most common reason for switching to insulin preparations from oral antidiabetic drugs by the practitioners for treatment of type 2 diabetes mellitus patients was found to be patients who doesn’t respond to the treatment of oral hypoglycaemic agents (OHAs), followed by diabetic complications like nephropathy, retinopathy, myocardial infarction, infections, stress, or other emergency co morbid conditions 96% of the doctors advised lifestyle modifications which include diet management, regular exercise, yoga etc. for their patients of type 2 diabetes mellitus.
Discussion
Out of 100 practitioners surveyed in this study, 84% of the practitioners were male whereas only 16% of them were females. The mean age of the practitioners surveyed was 36.08 ± 6.54 years. 69 doctors said that the age group of patients most commonly treated by them were between 46 to 60 years of age. This reflected an association between diabetes mellitus with advanced age as reported previously by 66 practitioners said that there is female prevalence among the type 2 diabetes mellitus patients treated by them.

64% of the practitioners included in the study prefer only lifestyle modifications (which includes diet management, regular exercise etc.) as the first line of management of a newly diagnosed type 2 diabetes mellitus, whereas the other 36% preferred an aggressive treatment in newly diagnosed patients with an antidiabetic medication along with lifestyle modification. 58.33% of the practitioners preferred metformin over sulphonureas as an anti-diabetic drug as first line, along with lifestyle modifications.

We found that overall metformin was the most commonly used antidiabetic agent. Even as monotherapy, metformin (43.4%) was found as a preferred antidiabetic drug than sulphonureas (39.6%) or thiazolidinediones (7.5%), α-glucosidase inhibitors (5.8%) or dipeptidyl peptidase IV (DPP-4) inhibitors (3.7%). Higher use of metformin was also reported by Vengurlekar et al. [1], Rajeshwari et al. [3], and Adibe et al. [8]. Although we would like to mention that these previous studies were conducted at a single tertiary hospital whereas we surveyed the preferences of the practitioners who practice independently in Pimpri city of Maharashtra.

We also found that the practitioners preferred double drug therapy (53%) over a monotherapy (34%) or a triple drug therapy (13%) for treatment of type 2 diabetes mellitus patients.

It was found that the most common reasons for switching to insulin preparations from oral anti diabetic drugs by the practitioners/clinicians was insulin resistance (13%), strict control of HbA1c (13%), and hypoglycaemia (13%). It was found that the most commonly preferred antidiabetic agent followed by sulphonylureas, thiazolidinediones, α-glucosidase inhibitors and dipeptidyl peptidase 4 inhibitors. Metformin + sulphonylureas is the most preferred combination therapy, followed by metformin + insulin. The most preferred insulin preparations are insulin mixtard (30/70), followed by short acting insulin/Actrapid insulin.

Even as monotherapy, metformin was also reported by Vengurlekar et al. [1], Rajeshwari et al. [3], and Adibe et al. [8]. Although we would like to mention that these previous studies were conducted at a single tertiary hospital whereas we surveyed the preferences of the practitioners who practice independently in Pimpri city of Maharashtra.

We also found that the practitioners preferred double drug therapy (53%) over a monotherapy (34%) or a triple drug therapy (13%) for treatment of type 2 diabetes mellitus patients.

Limitations
A comparison between the prescription patterns between the graduate, post graduate and super speciality practitioners can be undertaken, which might give an idea about different prescribing patterns.

Sponsorship: None
Conflicts of Interest: None

References
5. Rajeshwari S, Adhikari PMR, Pai MRSM. Drug utilisation study in geriatric type 2 diabetic patients. Journal of Clinical and Diagnostic Research [Internet].

