

Comparative Study on Effectiveness and Safety of Oral Antidiabetic Medications in Patients with Type 2 Diabetes Mellitus in a Tertiary Care Hospital of Bangalore, South India - A Prospective Cohort Study

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Abstract : BACKGROUND: Type 2 Diabetes is a chronic health condition where the body cannot effectively use the insulin it produces, leading to elevated blood sugar levels. It is often associated with lifestyle factors and insulin resistance. Globally, diabetes is on the rise, with urban areas like Bangalore seeing a surge due to lifestyle changes, stress, and dietary habits. To manage diabetes effectively, over 50 medications are available, each serving to regulate blood sugar through different mechanisms. This reflects the complex and individualized nature of diabetes treatment. Given the increase in medications for Type 2 diabetes mellitus, it is important to evaluate their effectiveness and safety so that clinicians can make informed choices while treating their patients. OBJECTIVES: To evaluate the effectiveness of various anti-diabetic medications used in the hospital in Type 2 diabetes patients by monitoring their HbA1c levels. To assess the safety of these medications by monitoring Adverse drug reactions if any. METHODOLOGY Design : Prospective Cohort study, Study period: 8 months, Sample Size: 100 patients, Inclusion Criteria: Patients above 18 years of both genders who were diagnosed with T2DM and who were prescribed oral hypoglycaemic agents. Exclusion Criteria: Diabetic patients with hepatic/renal failure, patients prescribed with insulin /not prescribed with OHAs and patients who were terminally ill, pregnant and lactating patients. Source of Data: Prescriptions, lab reports, ECG reports. Data collection forms were used to collect data which consisted of patient demographic details, drugs prescribed, laboratory investigations such as HbA1C, FBS, PPBS, ECG and any ADRs experienced. Data was collected at baseline, 3 months, and 6 months. It was statistically analyzed using SPSS (version 26) software. RESULTS: Greater number of patients (46%) were in the age group of greater than 61 years. 43 patients had no co-morbidities whereas 51 patients had Hypertension as the co morbidity. Basically 5 Drug combinations were prescribed as follows. Combination 1: Tablet Metformin HCL + Glimepiride (500, 2 mg) : 1-0-1, Combination 2: Tablet Sitagliptin + Metformin HCL (50, 500 mg) : 1-0-1, Combination 3: Tablet Vildagliptin + Metformin HCL (50, 500 mg): 1-0-1, Combination 4: Tablet Voglibose+ Glimepiride+ Metformin HCL (0.2, 2, 500mg): : 1-0-1, Combination 5: Tablet Voglibose+ Glimepiride+ Metformin HCL (0.2, 2, 500mg): : 1-0-1 and T. Sitagliptin +Metformin HCL (50, 500 mg): 0-1-0. Combination 5 (Voglibose, Glimepiride, Metformin, Sitagliptin) was most effective in reducing HbA1c levels, showing a significant decrease (-0.00682, p = 0.001), followed by Combinations 4 and 3. However, Combination 5 also had the highest incidence of gastrointestinal side effects (72.7%) and ECG abnormalities (27.3%). Combination 1 (Metformin + Glimepiride) had the highest occurrence of hypoglycemia due to Glimepiride's insulin-stimulating effects. Weight loss was most notable in Combination 5, affecting 36.36% of patients. CONCLUSION: The enhanced effectiveness of Combinations 3, 4, and 5 suggests that a multi-drug approach that incorporates different mechanisms of action is more effective in managing HbA1c levels in patients with diabetes. Adverse effect profiles should be considered for personalized treatment strategies.

Keywords : type 2 diabetes, safety, oral anti diabetic medications, effectiveness

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