LOW RISK OF CARDIOVASCULAR DISEASES WITH METFORMIN COMPARED WITH OTHER ANTI-DIABETIC DRUGS IN PATIENTS WITH TYPE 2 DIABETES

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ABSTRACT

BACKGROUND

Diabetes is treatable, yet not withstanding when glucose levels are under control. It significantly increase the risk of coronary illness and stroke. Especially, type 2 diabetes may have the accompanying conditions that add to their danger for creating cardiovascular illness, for example, hypertension, weight, and abdominal cholesterol. This study to investigate the risk of cardiovascular malady (CVD) in people with diabetes mellitus treated with metformin or other antidiabetic medications.

SUBJECTS AND METHODS

This was an observational study conducted in the Department of Medicine at Government General Hospital, Nizamabad. 500 patients were aged between 60 and below individuals diagnosed with cardiovascular problem irrespective of metformin or other anti-diabetic drugs from past years. Patient's comparison with previous use of metformin or other anti-diabetic drugs among the individuals and calculated the risk of cardiovascular disease who is on metformin or anti-diabetic drugs.

RESULTS

In comparison with metformin, long-term use of other than metformin were at greater risk of developing CVD (Adjusted OR (AOR)=0.83, 95% CI=1.12-2.60), but there was no consistent trend with increasing number of prescriptions. Long-term use of other antidiabetic drugs such as sulphonylurea (AOR=0.80, 95% CI=0.72-1.42), thiazolidinediones (AOR=0.69, 95% CI=0.31-2.40), or meglitinides (AOR=0.61, 95% CI=0.58-1.73) was showed related risk of developing CVD.

CONCLUSION

Long-term utilization of sulphonylurea, thiazolidinediones, or meglitinides was showed risk of developing CVD. There was a recommendation of a slightly bring down risk of CVD in long-term use of metformin.

KEYWORDS

Cardiovascular malady, Hypertension, Metformin.

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INTRODUCTION: Type2 Diabetes Mellitus (T2DM) is a noteworthy wellbeing issue as a result of its cardiovascular entanglements and financial expenses. Epidemiological confirmation shows that T2DM is a free hazard variable for cardiovascular diseases (CVDs). The rate of CVDs is roughly two times higher in diabetic patients than non-diabetic patients.[1] The outcomes distributed in the UK Prospective Diabetes Study in 1998.[2] Metformin, a biguanide glucose-bringing down operator, has been suggested as the primary line treatment by universal rules.[3,4] At the point when contrasted and slim down alone, metformin demonstrated a decrease of all-cause mortality in overweight patients (Hazard proportion [RR]=0.64; 95% CI: 0.45 to 0.91.) In the same study, non-overweight patients were randomised to get different glucose lowering medications and some took either metformin or sulphonylurea.

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An expansion of general mortality (RR=1.60; 95% CI: 1.02 to 2.52) was seen in the sulphonylurea bunch when contrasted and metformin bunch. Their decision in light of the consequences of the overweight patient gathering is that metformin diminishes in general and cardiovascular mortality. Selvin et al[5] and Bennett et al[6] likewise did exclude the after effects of non-overweight population despite the fact that they specified this subgroup. They reasoned that treatment with metformin hydrochloride was connected with a diminished danger of cardiovascular mortality (Pooled OR, 0.74; 95% CI, 0.62-0.89) contrasted and whatever other oral diabetes specialist or placebo treatment. They reasoned that it is likely that metformin monotherapy is connected with enhanced survival (MH-OR: 0.801 [0.625-1.024], p=0.076). Metformin play crucial role in the treatment of patients with type 2 diabetes.[7] Metformin diminishes basal glucose yield by smothering gluconeogenesis and glycogenolysis in liver also expanding glucose transfer in muscle tissue. As the most troubling difficulty, lactic acidosis. Despite the fact that it seems to be danger by all accounts to be low with frequency rates of lactic acidosis associated with metformin use going from 1 to 16.7 cases for every 100,000 patient years.[8,9]

Salpeter et al[10] recognised all trials and associate studies led in the year 1959 and 2002 and did not locate a solitary instance of lactic acidosis in 36,893 man years of metformin administration. Lalau and Race.[11] dissected 49 instances of lactic acidosis connected with metformin use; general mortality was not related with plasma lactate focuses. Strangely, plasma metformin focuses were, by and large, three times higher in patients who survived. These information propose that lactic acidosis might be fortuitous instead of causally connected with metformin use. As per a late survey,[12] the reported dangers of hypoglycaemia for metformin users fluctuated between 0 and 21%. Since metformin does not straightforwardly invigorate insulin emission, hypoglycaemia danger might be lower than for that of other oral anti-diabetes drugs. Be that as it may, hypoglycaemia in patients utilizing metformin may happen as a part of relationship with strenuous physical action or fasting. The present study is to evaluate the risk of metformin such as CVD, including stroke, MI, and HF, than other anti-diabetic drugs like sulphonylurea, thiazolidinediones, and meglitinides.

Subjects and Methods: It was observational study conducted in the Department of Medicine at Government General Hospital, Nizamabad.

Participants: 500 patients were aged between 60 and below individuals diagnosed with cardiovascular problem irrespective of metformin or other anti-diabetic drugs from past years.

Measurements: Comparison of previous use of metformin or other anti-diabetic drugs among the participants and calculated the risk of cardiovascular disease who is on metformin or anti-diabetic drugs.

Statistical Analysis: Populace attributes were investigated utilizing clear insights including mean standard deviation. The past incidence rate of CVD was ascertained as the aggregate number of CVD occasions amid over past years. ANOVA was used to compare between the different anti-diabetic drugs, which caused CVD.

	Exposed to Metformin	**Exposed to Sulphonylurea**	**Exposed to Thiazolidinediones**	**Exposed to Meglitinides**
n	146	124	125	105
Age	57.3±13.2	55.8±13.5	58.0±13.2	59.3±12.6
Sex (male), %	53.92	51.98	56.34	54.07
*CCI (1-33)	4.1±2.9	4.3±3.0	4.2±3.1	4.3±3.1
*aDCSI (0-13)	1.7±2.4	2.1±2.9	1.7±2.3	1.8±2.5
Comorbidity history				
Hypertension (%)	63.14	60.11	63.67	62.88
Heart failure (%)	8.48	8.89	7.51	7.23
Stroke (%)	14.33	17.74	17.51	18.34

Table 1: Patients' Characteristics According to Anti-Diabetic Drug Exposure at any Point During the Study

*CCI Charlson Comorbidity Index. aDCSI adapted diabetes complication severity index.

Table 1: Demonstrates the patients' attributes as per anti-diabetic drug presentation anytime amid the study. We distinguished 15 (7.5%) patients who got metformin. Meglitinides clients were moderately older and had more comorbidities and diabetic complexities when contrasted with those presented to other antidiabetic drugs.

*Adjusted hazard ratios were estimated from the Cox models adjusted for age, sex, diabetes duration, comorbidity history (Hypertension, Hyperlipidaemia, Coronary artery Diseases, Stroke, Myocardial Infarction, Heart Failure, Charlson Comorbidity Index), diabetic complications (Via adapted diabetic complication severity index).

Anti-Diabetic Drugs	**Time at Risk (Person-Year)**	**Incidence rate (Per 100 Person)**	**Unadjusted HR (95% CI)**	**Adjusted HR* (95 % CI)**	**p value**
Metformin (Ref drug)	15	18.73	0.82	0.83 (0.76, 0.91)	<0.0001
Sulphonylurea	255	45.86	0.67	0.80 (0.77, 0.84)	<0.0001
Pioglitazone	160	32.56	0.69	0.69 0.78 (0.49, 1.26)	0.3187
Repaglinide	70	36.51	0.49	0.61 (0.50, 0.75	<0.0001

Table 2: Hazard Ratios of Major Adverse Cardiovascular Events Associated With Exposure to Various Antidiabetic Drugs

HR hazard ratio, CI confidence interval.

Table 2: Shows CVD risks for each anti-diabetic drug as compared with non-exposure to a given other than metformin drug (e.g., metformin users vs. non-metformin users). SU, pioglitazone and repaglinide users had significantly higher CVD risks than those of their metformin (Non-exposure to these drugs), while meglitinides users had significantly higher CVD risks as compared with those of patients without exposure to these drugs. There was no statistical difference in CVD risks between pioglitazone users and metformin users.

DISCUSSION: This was observational study was done to evaluate CVD risk of metformin as contrast and other antidiabetic drugs. Metformin group had essentially bring down CVD risk when contrasted with non-metformin group. Metformin user had essentially bring down CVD risk than that for those treated with meglitinides and SU. Then again, our findings do have some clinical significance with regards to the way that patients with type 2 diabetes are 2 to 3 times more prone to develop CVD than are non-diabetic subjects. The ordinary CVD hazard calculates most regularly seen patients with type 2 diabetes incorporate hyperglycaemia, raised TG and low high-density lipoprotein (HDL) cholesterol fixations, and hypertension. It is clear from our outcomes that the impact of metformin treatment on these variables was high contrast contrasted with other against diabetic patients.

In particular, the change in CCI and aDCSI list score was less in patients with diabetes in metformin was practically identical to regulated as other anti-diabetic medications. In spite of the fact that way of life modification should be sans damage, it is by and large an obscure idea, and patients will most likely be unable to go along intimately with these way of life changes. Patients who are recommended metformin were typically encouraged to proceed with the way of life alterations that were relevant to DM. Patients on metformin had diminished rate of all-cause mortality, CVD occasions (Counting CHD, Stroke, and Heart Disappointment). For many years, sulphonylurea have been recommended by the American Diabetes Association as a second line therapy for the treatment of type 2 diabetes.

Despite its usefulness in glycaemic control, sulphonylurea can potentially produce many adverse effects such as weight gain and increased cardiovascular risk. Currently, approved package labels for all sulphonylurea are required to have a warning for increased cardiovascular risk. Previous study conducted by Li and colleagues conducted a prospective cohort study in which they followed 4,902 women (Mean age 68 years) with diabetes (Mean duration 11 years) for a 10-year period. All of the women were free of cardiovascular disease at baseline who is on metformin monotherapy, and their use of sulphonylurea and other medications are high risk of CVD was self-reported. When assessing the association of sulphonylurea with CHD and stroke, the researchers found that the duration of sulphonylurea use was only significantly associated with CHD risk (p=0.005). In addition, the RR for CHD was 3.27 (1.31-8.17) in diabetic patients who were treated with sulphonylurea compared to metformin monotherapy. The researchers said that the results of their study were consistent with previous reports from other retrospective observational studies. They study have to be conducted in large sample size, prospective study design, long duration of follow-up study, and validated cardiovascular outcome using medical records. Nonetheless, the researchers suggested that more prospective cohort studies should be done to warrant their findings.

CONCLUSION: Long-term utilization of sulphonylurea, thiazolidinediones, or meglitinide was showed risk of developing CVD. There was a recommendation of a slightly bring down risk of CVD in long-term use of metformin.

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