CODEN [USA]: IAJPBB ISSN: 2349-7750

INDO AMERICAN JOURNAL OF
PHARMACEUTICAL SCIENCES

SJIF Impact Factor: 7.187
http://doi.org/10.5281/zenodo.3964550

Available online at: http://www.iajps.com *Research Article*

TO DETERMINE THE EFFECTS PIOGLITAZONE AND GLIBENCLAMIDE IN MAINTAINING BLOOD SUGAR LEVELS: A COMPARATIVE STUDY

Dr Zubia Farooq[1], Dr Rubab Ameer[2], Dr Raveel Qayyum[3]
[1, 2] Islamic International Medical College Rawalpindi
[3] House Officer at Shalamar Hospital, Lahore

Article Received: May 2020 **Accepted:** June 2020 **Published:** July 2020

Abstract:

Objective: *The study is planned to compare and investigate the two oral antidiabetic drugs effects in patients with type II diabetes mellitus.*

Study design: *A Prospective and Comparative study.*

Place and duration: *Study is conducted in the Medicine department of Benazir Bhutto Hospital Rawalpindi for six months duration from September 2019 to February 2020.*

Methods: *After the review, 60 patients with type II diabetes mellitus who were not treated recently were included in this analysis. Into two groups; male and female patients were distributed. The patients were treated with pioglitazone15 mg given after meal in group I (n = 27). In group II (n = 33) patients were given 5 mg glibenclamide in the morning before breakfast. Patients with kidney diseases, peptic ulcer, blood diseases, liver diseases and serious complications were not included in the analysis. General physical examination, blood pressure, pulse, routine examination was done in every patient at admission and at 45th and 90th day. Fasting and random blood glucose was recorded with the Glucose-Oxidase Enzymatic method. The written approval was obtained and procedure was explained to the patients. Data was quantified as mean + SEM at the end of the analysis and with paired "t" test data was analysed.*

Results: *At the end of the study, the difference between the two groups showed better results. The mean FBS parameter at day 0 was187.32 ±11.95 mg / dl. The average BSF was 139.97±5.70 mg / dl at day 90. The value of P from day 0 to day ninety was P <0.05. On day 0, the mean values in the RBS parameter were 283.98±16.85mg / dl and at 90th day was 171.95±5.79 mg / dl. P value from day 0 to forty fifth day with P <0.005 ** (significantly moderate) and P value P <0.002 ** (significantly moderate) from day 8 to day 90 in group II with drug glibenclamide.*

Conclusion: *In type 2 diabetes mellitus; drug glibenclamide helps effectively in lowering the blood glucose level compared to pioglitazone in a given study period.*

Key words: *Oral antihyperglycemic drug, diabetes mellitus type 2, fasting plasma glucose.*

Corresponding author:
Dr. Zubia Farooq,
Islamic International Medical College Rawalpindi

QR code

Please cite this article in press Zubia Farooq et al, ***To Determine The Effects Pioglitazone And Glibenclamide In Maintaining Blood Sugar Levels: A* Comparative Study.,** *Indo Am. J. P. Sci, 2020; 07(07).*

INTRODUCTION:

The word "diabetes" was first written by Kappodokya Araetus (81-133AD). In 1675, the word Mellitus was added by a Great Britain name Thomas Willis after the rediscovery of sweetness in the urine and blood of patients[1]. The metabolism of carbohydrates, fats and proteins with diabetes mellitus is impaired by a weak response to insulin. Type 1 diabetes is associated with the damage to insulin secreting cells in the pancreas[2]. Type 2 diabetes is related to the target cells resistance to insulin action[3]. The insulin resistance is noted in Type 2 diabetes and advanced failure of beta cells. In Europe the childhood diabetes incidence has increased in the last 20 to 30 years[4]. In Africa, the burden and prevalence of type II diabetes is increasing rapidly[5]. In the UK; the most common chronic disease observed is Type 2 diabetes mellitus[6]. Type II diabetes mellitus patients mostly have many related diseases such as hypertension, obesity, hyperlipidemia and accelerated atherosclerosis. A diet guide for diabetes, which emphasizes the moderation of sugar and fat ingestion, the increase of fruits and vegetables and the restriction of salt[7]. In the type 2 diabetic patients initial diagnosis for many patients with the standard approach is physical activity and diet recipe and first step is to correct hyperglycemia[8]. With this methodology, an oral antihyperglycemic drug is added when blood sugar level targets cannot be maintained or achieved[9]. In type II diabetics, the primary insulin resistance and decreased insulin secretion deteriorated over time, often requiring the use of high dose anti-diabetic drugs to control blood glucose levels[10]. Sulfonylureas release much insulin in the blood, which helps decreasing blood glucose levels. Thiazolidinediones are generally referred to as glitazones. They decrease BSR levels by increasing the cells sensitivity to insulin. Pioglitazone has been approved in combination with monotherapy and sulfonylureas, metformin and insulin for the type II diabetes mellitus treatment.

MATERIALS AND METHODS:

This Prospective study was held in the Medicine department of Benazir Bhutto Hospital Rawalpindi for six months duration from September 2019 to February 2020 for six months duration from July 2018 to December 2018.

After screening only 60 patients were included, Diabetes mellitus type II (NIDDM) patients were selected from a total of 70 patients in this study, 10 of whom were discontinued because of low compliance and side effects. The enduring 60 subjects have completed the entire study duration. The subjects were distributed into 2 groups (n = 33) in group I (n = 27) in group II; patients who were not managed with Type 2 Diabetes mellitus in both sexes and women of various ages ranged from 03 to 72 years. Patients with heart disease, peptic ulcer, liver and blood disorders and complex diseases were omitted from the analysis. In the beginning; all participant detailed history and clinical examination was done. After clarifying the information and limitations linked to patients, written approval was taken. The main study period was three months with every two weeks follow-up time. Each participant's age, name, gender, address, occupation, surgery, previous medications, follow-up visits was recorded. The required information is recorded in a specially designed written form. All basic readings were recorded on the first day of the analysis and same evaluations were made on the 45th and 90th day according to the given protocols and research design. After meeting all the preliminary necessities of the subjects in Group I, a dose of 15 mg of pioglitazone was given once a day after the meal. In group II; Patients were given 5mg glibenclamide early in the morning, just before the breakfast once a day, during the entire working time. Patients were called to monitor their pulse, blood pressure, general physical appearance and weight and laboratory investigations. During each clinical visit, compliance with drug therapy was checked by consultation and counselling. The titration of the drug dose is not requisite during the study time. RBS andFRBS were checked by the enzymatic method "Glucose oxidase". The sample was taken for BSR in a single 5 cc syringe in aseptic media. Data were stated as mean ± SEM and to direct the statistical significance as the variation the `t` test was applied. The probability value "<0.05" was the significance limit.

RESULTS:

From the 70 patients of type 2 diabetes mellitus, sixty completed the study duration. The post-treatment and reference values are given in Tables. When the findings were summarized and comparison of the test parameter was done, it was found that the glibenclamide decreased the BSR levels in type II diabetic patients within a certain time duration.

In Group I, (n = 27) were the total number of subjects from which 15 (58.9%) were female and 12 (41.1%) were male.

Sex	*Medicine Given*	*Number of patients*	*Percentage*
Male	Pioglitazone	12	58.9%
Female	Pioglitazone	15	41.1%

In the Group II glibenclamide group, (n = 33) were the total number of cases was male were 13(38.9%) and females were 20(61.1%).

Sex	*Medicine Given*	*Number of patients*	*Percentage*
Male	Glibenclamide	13	38.9%
Female	Glibenclamide	20	61.1%

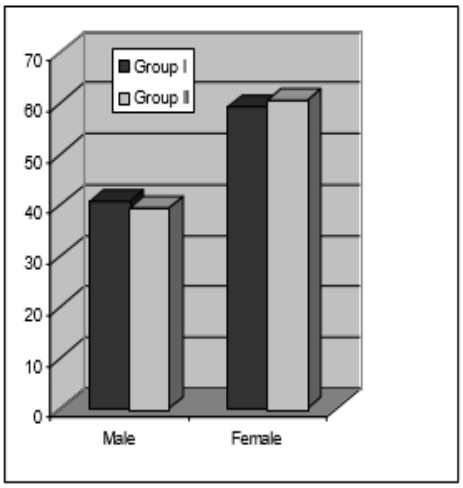
At the end of the study, the difference between the two groups gave improved results in group II glibenclamide patients.

Parameters	*At 0 day*	*At 90th day*	*P-value*	
			From 0 day to 45th day	From 45th day to 90th day
RBS mg/dl	283.98±16.85	171.95±5.79	<0.005	<0.002
FBS mg/dl	187.32 ±11.95	139.97±5.70	>0.005	<0.05

In the FBS parameter on day 0, 187.32 ±11.95 mg / dl was the mean value and 139.97±5.70 mg / dl per was the mean value on day ninety. P value from 45th to 90th day was P <0.05 * (Significant). On day 0, the mean values of RBS were 283.98±16.85mg / dl and on 90th day was 171.95±5.79 mg / dl. P value was less than 0.005 on day 0 and the 45th (moderately significant), P value was 0.00 g at 45th day to 90th day ** (moderately significant) with Glibenclamide drug II. When study ends, we obtained improved results than patients with glibenclamide in group II.

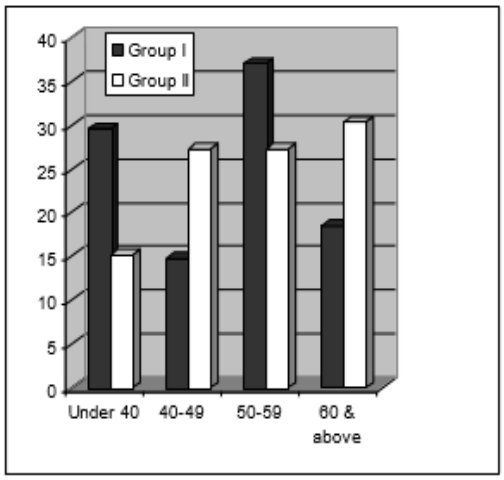
Figure 1: Percentage of patients with pioglitazone I and group II glibenclimade as a group, and patient characteristics in terms of gender.

Graph 1: Characteristics of the patient gender wise, with percentage on pioglitazone group-I and glibenclimade group-II patients.



Key: %age: indicates percentage among groups. n: indicates number of patients in groups.

Graph 2: Characteristics of the patient age wise, with percentage on pioglitazone group-I and glibenclimade group-II patients.



Key: % age: indicates percentage among groups. n: indicates number of patients in groups.

Figure 2: The percentage of patients with a group pioglitazone I and group II glibenclimade.

DISCUSSION:

The work of Barrow BA, Rachman J, Levy JC, et al was consistent with our analysis; According to the studies, treatment of sulfonylureas significantly decreased blood sugar in fasting compared to dietary treatment alone[11]. In both studies some variations were evident in study of oral hypoglycaemia. Engler RL and Yellon DM study in the prevention of vascular complications compared with insulin and diet alone. This study concluded that the study initiated a confident provision for glibenclamide, an oral hypoglycemic drug in controlling blood sugar levels[12]. The results of our analysis, in group II glibenclamide given patients

the given parameters are the mean value was 139.97±5.70 mg / dl at day 0 with given FBS parameter. It was 187.32 ±11.95 mg / dl per at 90th day. P value was less than 0.005 on day 0 and the 45th (moderately significant), P value was 0.00 g at 45th day to 90th day ** (moderately significant) with Glibenclamide drug II. The drug glibenclamide proved to be better regulator of blood sugar level in a given study time. Some other factors and reasons for poor control of blood glucose level in patients with pioglitazone group I; It was observed that some of the most important weaknesses and omissions of the patients were sedentary lifestyles, less physical activity, careless attitudes related to the disease, poor socioeconomic problems were observed, and the economic situation worsened the glycemic control the lack of knowledge. The aim of Hanefeld M et al was to evaluate the safety and efficacy of metformin, pioglitazone supplementation, for one year of treatment of sulfonylureas in patients with poorly controlled type II diabetes[13]. Jarvinen H Yki has done a great study in the sense that thiazolidinediones at this time can better control BSR levels[14]. Our study does not support this point because thiazolidinedione drugs, which are not commonly be given in the liver disease, result in treatment failure. The clinical studies of Prins JB, Sullivan, O'Moore TM, showed that approximately 10-25% of patients cured with thiazolidinediones did not reach a 15% decrease in fasting blood glucose, one observation of the clinical trial[15]. In the current study drug was given pioglitazone.

CONCLUSION:

The type 2 diabetes mellitus was better controlled by Glibenclamide in a given study period, reducing blood glucose levels compared to pioglitazone in our study.

REFERENCES:

1. Seufert, J., Fritsche, A., Pscherer, S., Anderten, H., Borck, A., Pegelow, K., Bramlage, P. and Pfohl, M., 2019. Titration and optimization trial for the initiation of insulin glargine 100 U/mL in patients with inadequately controlled type 2 diabetes on oral antidiabetic drugs. *Diabetes, Obesity and Metabolism*, *21*(2), pp.439-443.
2. Kim, Kibum, Sudhir Unni, Diana I. Brixner, Sheila M. Thomas, Cody J. Olsen, Kimberly L. Sterling, Matt Mitchell, and Carrie McAdam-Marx. "Longitudinal Changes in HbA1c following Treatment Intensification after Inadequate Response to Two Oral Antidiabetic Agents in Patients with Type 2 Diabetes." *Diabetes, Obesity and Metabolism* (2019).
3. Naruse, Mitsuhide, Yasuhiro Koike, Nozomu Kamei, Ryuichi Sakamoto, Yuko Yambe, and Michinori Arimitsu. "Effects of azilsartan compared with telmisartan on insulin resistance in patients with essential hypertension and type 2 diabetes mellitus: An open-label, randomized clinical trial." *PloS one*14, no. 4 (2019): e0214727.
4. Zuo, PanPan, JianFeng Shi, Juan Yan, LiHong Yang, Chao Liu, Li Yuan, and QingQing Lou. "Effects of Insulin Therapy and Oral Hypoglycemic Agents on Glycemic Control for Type 2 Diabetes Mellitus Patients in China–A Case Control Study." *Experimental and Clinical Endocrinology & Diabetes* (2019).
5. Kuo, S., Yang, C.T., Wu, J.S. and Ou, H.T., 2019. Effects on clinical outcomes of intensifying triple oral antidiabetic drug (OAD) therapy by initiating insulin versus enhancing OAD therapy in patients with type 2 diabetes: A nationwide population-based, propensity-score-matched cohort study. *Diabetes, Obesity and Metabolism*, *21*(2), pp.312-320.
6. Canivell, Silvia, Manel Mata-Cases, Jordi Real, Josep Franch-Nadal, Bogdan Vlacho, Kamlesh Khunti, Mònica Gratacòs, and Dídac Mauricio. "Glycemic Control after Treatment Intensification in Patients with Type 2 Diabetes Uncontrolled on Two or More Non-Insulin Antidiabetic Drugs in a Real-World Setting." *Diabetes, Obesity and Metabolism* (2019).
7. Patorno, E., C. Gopalakrishnan, K. G. Brodovicz, A. Meyers, D. B. Bartels, J. Liu, M. Kulldorff, and S. Schneeweiss. "Cardiovascular safety of linagliptin compared to other oral glucose lowering agents in patients with type 2 diabetes: a sequential monitoring program in routine care." *Diabetes, Obesity and Metabolism* (2019).
8. Luo, Miyang, Chuen Seng Tan, Wei Yen Lim, Kee Seng Chia, Wern Ee Tang, E. Shyong Tai, and Kavita Venkataraman. "Association of diabetes treatment with long-term glycemic patterns in patients with type 2 diabetes mellitus: A prospective cohort study." *Diabetes/metabolism research and reviews* (2019): e3122.
9. Van Gaal, Luc, Michel P. Hermans, Evis Daci, Kris Denhaerynck, Lut De Meester, Karen MacDonald, Ivo Abraham, Stefaan Vancayzeele, and Michael Maris. "Effectiveness and Tolerability of Vildagliptin and the Single Pill Combination of Vildagliptin and Metformin in "Real-World" Management of Type 2 Diabetes Mellitus: The G-FORCE Study." *Diabetes Therapy* (2019): 1-15.
10. Chaykin, Louis, Anuj Bhargava, Raymond De la Rosa, Carol H. Wysham, Lone Nørgård Troelsen, Signe H. Østoft, and Athena

Philis-Tsimikas. "Effect of Insulin Degludec Versus Insulin Glargine U100 on Hypoglycemia in Hispanic Patients With Type 2 Diabetes: Results From the SWITCH 2 Trial." *Clinical Diabetes* 37, no. 1 (2019): 73-81.

11. Brooks, Anne, Jakob Langer, Tommi Tervonen, Mads Peter Hemmingsen, Kosei Eguchi, and Elizabeth Dansie Bacci. "Patient Preferences for GLP-1 Receptor Agonist Treatment of Type 2 Diabetes Mellitus in Japan: A Discrete Choice Experiment." *Diabetes Therapy* (2019): 1-15.
12. Halberg, Inge B., Karsten Lyby, Karsten Wassermann, Tim Heise, Eric Zijlstra, and Leona Plum-Mörschel. "Efficacy and safety of oral basal insulin versus subcutaneous insulin glargine in type 2 diabetes: a randomised, double-blind, phase 2 trial." *The Lancet Diabetes & Endocrinology* 7, no. 3 (2019): 179-188.
13. Xu, Yingqi, David Hsien Yung Tan, and Joyce Yu-chia Lee. "Evaluating the Impact of Self-monitoring of Blood Glucose Frequencies on Glucose Control in Patients with Type 2 Diabetes Who do not Use Insulin: A Systematic Review and Meta-analysis." *International journal of clinical practice* (2019): e13357.
14. Farhat, Rhea, Jennifer Assaf, Hicham Jabbour, Hady Licha, Aline Hajj, Souheil Hallit, and Lydia Rabbaa Khabbaz. "Adherence to oral glucose lowering drugs, quality of life, treatment satisfaction and illness perception: A cross-sectional study in patients with type 2 diabetes." *Saudi pharmaceutical journal* 27, no. 1 (2019): 126-132.
15. Decroli, Eva, Alexander Kam, and Dwisari Dillasamola. "The percentage of depressive symptoms in patients with type 2 Diabetes Mellitus in M Djamil General Hospital Padang, Indonesia." *Marmara Pharmaceutical Journal* 23, no. 2 (2019).