e-ISSN: 0975-1556, p-ISSN:2820-2643

Available online on www.ijpcr.com

International Journal of Pharmaceutical and Clinical Research 2022; 14(4); 298-302

Original Research Article

A Comparative study of Glibenclamide with Insulin in Gestational Diabetes Mellitus

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Received: 15-03-2022 / Revised: 30-03-2022 / Accepted: 15-04-2022
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Conflict of interest: Nil

Abstract

Background: Gestational Diabetes Mellitus (GDM) is a very common disease that is detected among the pregnant women. The incidence is on the rise and the effective control of blood glucose levels helps to reduce the associated maternal and neonatal morbidities to a great extent. Insulin has been the gold standard in the management of GDM because of its efficacy and also its safety as it does not cross the placenta but has many demerits as far as patient acceptance and compliance are concerned. Thus, we have undertaken a study to compare the efficacy of glibenclamide and insulin to attain adequate glycaemic control.

Material and Methods: This is an Observational comparative study conducted in the department of Obstetrics and Gynaecology, Chalmeda Anand Rao Institute of Medical Sciences, Kariminagar, during the period from February 2021 to August 2021. About 150 patients attending the antenatal clinic were included in screening for Gestational diabetes mellitus, belonged to gestational age between 11 to 33 weeks.

Results: Demographic profiles of the patients were comparable between both the groups. There was no significant difference observed in mean distribution of plasma sugar between the groups at fasting and 2 hours after mean during screening, treatment and before discharge. We have not observed any significant difference in HbA1C between the groups before treatment and after treatment.

Conclusion: Though we have not with significant difference between glibenclamide and insulin, but Glibenclamide may be a safe and efficient alternative therapy to Insulin in the treatment of gestational diabetes mellitus.

Keywords: Gestational Diabetes Mellitus, Glibenclamide, Insulin, HbA1C.

Introduction

Gestational diabetes Mellitus is a common complication of pregnancy, and prevalence is increasing.[1] Gestational diabetes mellitus is defined as carbohydrate intolerance of variable severity with onset or first recognition during pregnancy regardless of whether or not insulin is used for treatment. Diabetes Mellitus complicates 2–20% of all pregnancies. Of this 90% is Gestational diabetes mellitus.

Gestational Diabetes mellitus is still a great problem for the mother and fetus and even

in the best conditions, the risk of fetal malformations and mortality is 2–5 times higher than normal pregnancy.[2] It will the crucial step if treat gestational diabetes mellitus during pregnancy, if it is untreated will be the greater risk of developing some fetal, neonatal and maternal outcomes.[3-6] Hyperglycemia is one of the associated risk factor for pregnancy in women with gestational diabetes mellitus. In order to control hyperglycemia in pregnant women, principal approach is dietary therapy and insulin administration, which is standard therapy for dietary failures. Insulin administration is standard therapy of gestational diabetes because of its high effectiveness and also due to large molecular size of insulin, it does not cross the placental barrier. From some previous studies it is also observed that anti insulin antibody is produced in response to insulin transcription in pregnant women with gestational diabetes mellitus and also insulin can cross the placenta as part of the insulin antibody complexes and this autoimmune response to exogenous insulin can affect fetal development.

Some studies also demonstrated that glibenclamide does not cross human placenta in appreciable amount in contrast to older drugs like metformin. In glibenclamide, stimulation of insulin release from the pancreas –single dose provokes brisk release of insulin from pancreas. Glibenclamide acts on the sulfonylurea receptors on the pancreatic beta cell membrane – causes depolarization by reducing conductance of ATP sensitive potassium channels. This enhances calcium influx – degranulation. The rate of insulin secretion at any glucose concentration is increased. Reduction of glucagon levels. Increasing somatostatin release. Hepatic degradation of insulin is slowed. It has an extrapancreatic action. It increases binding of insulin to target tissues and receptors.

Some studies showed that glibenclamide can be used as the first blood sugar controller in pregnancy. [7] Study by Zeng et al. showed that glibenclamied is effective treatment on women with gestational diabetes.[8] But main concern about glibenclamide is its drug reaction, and also has some adverse effect like hypoglycaemia, Nausea, Vomiting, diarrhoea, hypersensitivity reaction, but the incidence of adverse effect is quite low nearly 3% to 6%

Thus due to conflicting research results and importance, we have conducted a study to compare the efficacy of glibenclamide and insulin to attain adequate glycaemic control

Materials and Methodology

This Observational comparative study conducted in the department of Obstetrics and Gynecology, Chalmeda Anand Rao Institute of Medical Sciences, Karimnagar, during the period from February 2021 to August 2021 after getting approval from ethical committee.

About 150 patients attending the antenatal clinic were included in screening for Gestational diabetes mellitus. The patients were selected randomly and belonged to gestational age between 11 to 33 weeks. Patients were diagnosed as Gestational diabetes mellitus if fasting plasma glucose more than or equal to 95 mg /dl and or 2 hr PPG more than or equal to 140 mg /dl. So out 150 patients, 50 patients were included in the study by using criteria.

Inclusion Criteria

- Women with gestational age between 11-33 weeks.
- Who were willing to deliver and take part in the study.

Exclusion Criteria

- Women with gestational age less than 11 weeks and more than 33 weeks.

We have assigned 25 patients each among 50 selected patients in two group called Group-I and Group-G randomly.

Group-I : 25 patients were put on Insulin therapy.

Group -G : 25 patients were put on tablet Glibenclamide.

After explaining study protocol and these women were randomly assigned to receive Insulin or Glibenclamide according to the treatment protocol. At the institution of treatment, a detailed obstetric, family history and thorough clinical examination done.

Observation and Results:

Demographic profile of the patients was comparable in both the groups. We observed age group of the patients form both group between 21 to 33 years of age. Also, BMI of the patients were between 22 to 26. Weight of the patients in both the groups were comparable. Shown in bellow table no.1

Table 1: Distribution of Demographic Profile.

Parameters	**Group-I (Insulin) (N=25)**	**Group-G (Glibenclamide) (N=25)**
Age	25.32 ± 3.12	26.23 ± 4.2
Gestational Age	25.23 ± 4.23	24.10 ± 6.24
BMI	24.8 ± 4.1	23.54 ± 3.86
Weight	55.24 ± 8.86	51.42 ± 9.52
Gravida		
Primi	18(72%)	16(64%)
Multi	7(28%)	9(36%)
History of Patients		
Bad Obstetrics History	9(36%)	12(48%)
Positive Family History	6(24%)	8(32%)

Patients had comparable distribution of bad obstetrics history and positive family history.

Table 2: Mean Distribution of plasma sugar

	Group-I (Insulin) (N=25)	Group-G (Glibenclamide) (N=25)	P-value
Screening			
Fasting Plasma Glucose	98.06 ± 26.32	86.9 ± 24.23	0.1254
2 hr after Meal	181.42 ± 22.53	178.89 ± 23.45	0.699
Treatment			
Fasting Plasma Glucose	79.26 ± 16.5	75.82 ± 9.26	0.36
2 hr after Meal	105.23 ± 12.24	108.45 ± 7.49	0.26
Discharge			
Fasting Plasma Glucose	70.89 ± 14.55	68.99 ±8.75	0.57
2 hr after Meal	98.78±13.65	97.42±7.7	0.66

Observing plasma sugar among the patients in both group we have observed that there was no significant difference was observed between Group-I and Group-G, during screening, Treatment and discharge of the

patients at fasting and 2 hours post glucose, the aim of treatment was to keep fasting plasma glucose below 90 mg / dl and Post Prandial plasma glucose below 120 mg / dl and mean plasma glucose 105 mg / dl measured at any time of the day. Thus it was observed that adequate glycaemic control was achieved in both insulin and glibenclamide group.

Table 3: Mean Distribution of HbA1C

HbA1c	Group-I (Insulin) (N=25)	Group-G (Glibenclamide) (N=25)	P-value
Pre – Treatment HbA1c	5.3 ± 0.45	5.6 ± 0.69	0.07
Post Treatment	5.5±0.36	5.3±0.49	0.1

We have not observed any significant difference in HbA1C between the groups before treatment and after treatment.

Discussion:

In present study of comparison of glibenclamide and insulin in patients with gestational diabetes mellitus, 25 patients received insulin and another 25 patients received glibenclamide.

In demographic profile of the patients between two groups we have found that, all the demographic parameter were comparable with the study conducted by Langer et al comparing 203 patients in insulin group and 201 patients in glibenclamide group. The age distribution in present study is slightly lower but comparable with Langer et al[9] one. The slightly lower age distribution in present study may be due to younger age at marriage in our society. More non-obese patients with BMI <26 were included in present study as compared to the study done by Langer et al in which more obese patients were included in the study in both insulin (65%) and glibenclamide (70%) group. Gestational age at entry into study was similar and comparable in both present study and study by Langer et al. Demographic profiles results of our study also comparable with the study conducted by M Sammi et al and Pavithra.I et al.[10, 11]

Adequate glycaemic control was achieved in both insulin and glibenclamide group in the present study and no patient was switched over to insulin because of poor glycaemic control. In Langer et al study except 8 patients (4%) who were switched over to insulin owing to poor glycaemic control with maximum dose of glibenclamide (20 mg) other patients attained good glycaemic control in both the groups. The blood sugar values of patients of Langer et al study given in the table was measured by them at home which had a strong association with the blood sugar values taken during clinic visits. Study by M Sammi et al observed that during treatment glycemic control was comparable in both the groups which was similar to our study and also study by Pavithra.I et al. observed comparable results of glycemic control during treatment.

Study by M Sammi et al and Pavithra.I et al. HbA1C test was comparable between the both the groups. Pre –pregnant HbA1c were similar in both present study and Langer et al study and lie within normal range.

Study has some limitation of sample size and also in our study we have studied the neonatal outcome which will play very important role and also we have not assess the amount of drugs used in each patient, length of NICU stay for infants, and the

cause of hospitalization.

Conclusion:

Though we have not with significant difference between glibenclamide and insuline but Glibenclamide may be a safe and efficient alternative therapy to Insulin in the treatment of gestational diabetes mellitus. However further sufficiently powered and randomized clinical studies are still needed, which address variety of issues including long term follow up of children, to determine the role of glibenclamide as an alternative to insulin in the treatment of women with Gestational Diabetes Mellitus.

Acknowledgement: None

Funding: None

References:

1. Hunt KJ, Schuller KL. The increasing prevalence of diabetes in pregnancy. Obstet Gynecol Clin North Am 2007; 34:173-99.
2. McCance DR. Diabetes in pregnancy. Best Pract Res Clin Obstet Gynaecol 2015; 29:685-99.
3. Kimber-Trojnar Z, Marciniak B, Leszczynska-Gorzelak B, Trojnar M, Oleszczuk J. Glyburide for the treatment of gestational diabetes mellitus. Pharmacol Rep 2008; 60:308-18.
4. Reece EA, Homko CJ. Diabetes mellitus in pregnancy. What are the best treatment options? Drug Saf 1998; 18:209-20.
5. Balsells M, Corcoy R, Mauricio D, Morales J, García-Patterson A, Carreras G, et al. Insulin antibody response to a short course of human insulin therapy in women with gestational diabetes. Diabetes Care 1997; 20:1172-5.
6. Weiss PA, Kainer F, Pürstner P, Zehetleitner G, Hüttner U, Haas J. Anti-insulin antibodies and birth weight in pregnancies complicated by diabetes. Early Hum Dev 1998; 53:145-54.
7. Silva JC, Bertini AM, Taborda W, Becker F, Bebber FR, Aquim GM, et al. Glibenclamide in the treatment for gestational diabetes mellitus in a compared study to insulin. Arq Bras Endocrinol Metabol 2007; 51:541-6.
8. Zeng YC, Li MJ, Chen Y, Jiang L, Wang SM, Mo XL, et al. The use of glyburide in the management of gestational diabetes mellitus: A meta-analysis. Adv Med Sci 2014; 59:95-101.
9. Langer OD, Conway DL, Power ML eta:;Management of DiabetesMellitus by obstetrician and gynaecologist; Obst Gynaecol 1998;91(sptl):643-7.
10. Behrashi M, Samimi M, Ghasemi T, Saberi F, Atoof F. Comparison of glibenclamide and insulin on neonatal outcomes in pregnant women with gestational diabetes. Int J Prev Med 2016; 7:88.
11. Pavithra, I., Pillai, S.K., Vijayaraghavan, J., A Comparison of Insulin and Glibenclamide in the Treatment of Gestational Diabetes Mellitus. Indian Journal of Obstetrics and Gynaecology Research 2015;2(4):270-275.