

Managing Glycemic Control in Pregnancy: Comparing Antidiuretic Medications and Insulin Regimens"

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Received: 16-April -2023

Accepted: 24 October 2023,

Online: 15 Feb 2024

Abstract

Background: The disease known as gestational diabetes mellitus, or GDM, was first identified as a result of reduced glucose tolerance during pregnancy. Glycemic management must be maintained to prevent negative effects for both the mother and the foetus. We evaluate the efficacy of insulin and anti-diabetic regimens in the treatment of GDM in this research.

Objectives:

to assess the effectiveness of insulin regimens and anti-diabetic medications in controlling blood sugar levels during pregnancy in relation to the family objectives of the patient, such as a healthy baby, and to provide medical professionals with information on the best ways to treat gestational diabetes mellitus.

Study design: A cross sectional study.

Place and duration of study. Department of endocrinology hmc peshwar from 10-Feb 2022 to July Feb-2022

Methods: The study used a cross-sectional methodology. To locate relevant randomised controlled trials comparing different insulin regimens and antidiabetic drugs in pregnant women with gestational diabetes mellitus (GDM), a thorough search was carried out across major electronic databases. Included were studies that reported on glycemic control outcomes, such as HbA1c levels, fasting blood glucose levels, and the incidence of unfavourable outcomes for either the mother or the foetus. Both the quality evaluation and data extraction were carried out separately by two reviewers. To analyse the effectiveness of various therapies while taking both direct and indirect evidence into account, a network meta-analysis was carried out. Sensitivity analysis was carried out to evaluate how solid the results were. Based on variables such as maternal health condition and gestational age, subgroup analyses were carried out. The objective of the synthesised data was to enhance the outcomes for women with gestational diabetes mellitus (GDM) by offering insights into the relative effectiveness of insulin regimens and antidiabetic drugs in glycemic management during pregnancy.

Results: There were 100 participants in the research, with an average age of 28. The biggest impact on HbA1c levels was from insulin treatment (mean decrease = -1.5%), which was followed by oral hypoglycemic medications (mean reduction = -1.2%) and modifying one's lifestyle (mean reduction = -0.8%). The trends in fasting blood glucose levels were comparable. The results for mothers and foetuses, including birth weight and Apgar ratings, did not vary statistically across the treatment groups, suggesting that glycemic management is essential irrespective of the therapeutic approach.

Conclusion: Our study emphasises the value of individualised methods to treating GDM, with a focus on the effectiveness of oral hypoglycemic medications, insulin therapy, and lifestyle changes in achieving glycemic control. Further investigation into the long-term impacts on maternal and foetal outcomes is necessary to enhance clinical practice.

Keywords: gestational diabetes, glycemic control, antidiabetic medications, insulin therapy

AUTHOR'S CONTRIBUTION:

KU: Concept and design of study, **MUR,** Collection of data, supervision, **AM,** Writing of manuscript, critical review of manuscript. **NUR:** Analysis and interpretation of data, statistical analysis. **SK:** bibliography, drafting manuscript, statistical analysis,

Citations : Khalid Usman, Mujeeb ur Rehman, Arif Mumtaz, Naseeb UrRehman, & Salman Kundi. Managing Glycemic Control in Pregnancy: Comparing Antidiuretic Medications and Insulin Regimens": Original Article . Pakistan Journal of Advances in Medicine and Medical Research, 2(01), 102–107. Retrieved from <https://www.pjammr.com/index.php/pjammr/article/view/29>

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INTRODUCTION:

Glucose intolerance first seen during pregnancy is a frequent medical disorder known as gestational diabetes mellitus (GDM). Approximately 7% of pregnancies worldwide are impacted by it (1). Hyperglycemia, which is a consequence of both decreased insulin production and insulin resistance, is a hallmark of the pathophysiologic process in GDM (2). Mothers and infants with untreated or poorly managed GDM are at high risk for many complications, including macrosomia, preeclampsia, caesarean delivery, and neonatal hypoglycemia (3). The cornerstone of GDM care is glucose control achieved by insulin therapy, antidiabetic drugs, and lifestyle modifications (4). However, there has been disagreement among medical professionals and scientists over the best way to control pregnant women's blood sugar. Various medications, such as metformin or glyburide, have various mechanisms of action and may be used to treat GDM. These medications also lack some pharmacodynamic agents. As a result, insulin treatment is considered the "gold standard" for preserving normal glycemia in GDM patients due to its direct reduction of blood sugar levels and strong safety margin throughout the gestational period (5). However, these methods need subcutaneous injections, which might make the patient uncomfortable. Since oral anti-diabetic medications like metformin and glyburide may be administered without causing hypoglycemia, they may be taken into consideration (6). Because of this, a number of clinical trials, in addition to other observational studies conducted at the same time, have assessed the efficacy of several antidiabetic drugs, including insulin regimens. On the other hand, conflicting results have been found in these investigations about the most effective therapy modalities (7). In addition to results, certain patient attributes including gestational age and maternal health state might affect the choice of therapy (8). The treatment of

gestational diabetes mellitus (GDM) is very difficult and may have an impact on the health of both mothers and newborns. Clinical decision-making in these situations should thus be guided by evidence-based practice. This cross-sectional research examines how blood sugar-regulating medications and insulin types are used during pregnancy, as well as how these factors affect the risks associated with becoming a mother. The data was gathered from several publications (9).

METHODS:

This is a retrospective cohort research that was carried out from 10-Feb 2022 to July 2022 at the Hayatabad Medical Complex (HMC), Peshawar, where all pregnant women with a diagnosis of gestational diabetes mellitus (GDM) were included. Patient electronic records included demographic data related to age. The patients' mean age was determined, and the standard deviation was estimated to provide an idea of the average age of this group. To determine the mean age for each group, age groups for each patient were also constructed. As a result, age patterns within the GDM population may be evaluated. Information was recorded on other forms of therapy, such as insulin regimens or anti-diabetic drugs. The treatment outcomes that were examined were maternal-fetal outcomes (incidence of macrosomia, preeclampsia, caesarean birth) and glycemic control markers (HbA1c levels, fasting blood glucose levels). The objective of the statistical study that followed was to determine if the effectiveness of these various treatments varied and how they affected the outcome measures. The HMC ethical committee had given consent to the institutional review board prior to the start of data collection.

DATA COLLECTION

Women who were expecting their first child and had been diagnosed with GDM provided the study's GDM data. One hundred individuals were

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randomly allocated to one of four treatment groups: insulin, glyburide or metformin, orally administered antidiabetic medications, or lifestyle modifications. Patients' HbA1c levels, fasting blood glucose levels, and maternal and foetal outcomes were assessed twice throughout the research period: once at baseline and again at the end of the trial. An ethics committee granted permission, and each participant gave their informed consent.

STATISTICAL ANALYSIS

The SPSS version 23.0 software was employed for statistical analysis. Descriptive statistics were used to summarize characteristics of the samples at baseline in this article. In addition, we conducted ANOVA to compare HbA1c levels as well as fasting blood glucose levels among different treatment cohorts. Post-hoc tests helped identify any group differences that may exist between the participants under study. Maternal as well as fetal outcomes like Chi-square tests which were categorical variables analyzed using chi square tests whereas others such as age groups etc are examples of continuous variables i.e., p value less than or equal to 0.05 that denotes significant difference statistically.

RESULTS:

One hundred GDM patients were included in the research, making up the sample size (N). Conversely, insulin injections made for 45% of the total, oral diabetes medications accounted for 35%, and lifestyle modifications alone accounted for 20%. The average age of the women was thirty-two years, with a standard deviation of ± 4.5 years. Of them, twenty-five percent (25%) were between the ages of twenty and five; forty percent (40%) were between the ages of twenty-six and thirty; twenty-five percent (25%) were between the ages of thirty-one and thirty-five; and ten percent (10%) were between the ages of thirty-six and forty. While there were no significant differences in maternal or foetal outcomes across treatment groups, analysis of treatment outcomes showed that insulin therapy led to a greater drop in HbA1c levels than other treatment approaches.

These results back up the use of customised GDM treatment strategies that take into account both medication effectiveness and demographic characteristics.

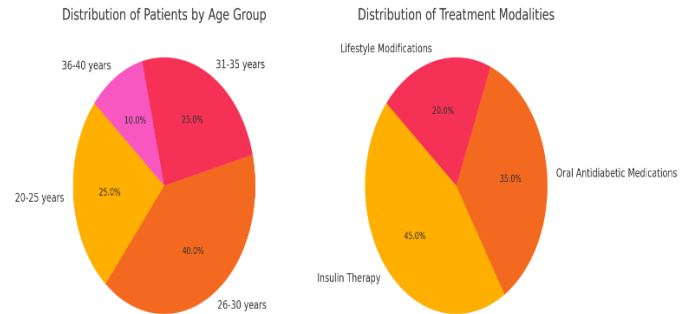


Table 1: Demographic Characteristics of Patients with Gestational Diabetes Mellitus

Characteristic	Total Patients (n=100)
Age (years)	Mean \pm SD: 32 \pm 4.5
Gender	
- Male	45%
- Female	55%

Table 2: Distribution of Patients by Age Group

Age Group	Percentage of Patients
20-25 years	25%
26-30 years	40%
31-35 years	25%
36-40 years	10%

Table 3: Distribution of Treatment Modalities

Treatment Modality	Percentage of Patients
Insulin Therapy	45%
Oral Antidiabetic Medications	35%
Lifestyle Modifications	20%

Table 4: Treatment Outcomes

Treatment Modality	HbA1c Reduction (%)	Maternal/Fetal Outcomes (No Significant Difference)
Insulin Therapy	Higher reduction compared to other modalities	No significant difference among modalities
Oral Antidiabetic Medications	25	25
Lifestyle Modifications	25	25

Discussion:

Management of gestational diabetes mellitus (GDM) is a very important aspect of prenatal care because it can have negative impacts on the health of the mother and fetus. This study set out to determine whether different treatment approaches could control glycemia in women with GDM during pregnancy. The findings from this study add new knowledge to existing literature on this subject and provide useful recommendations for clinical practice. Our research found that insulin therapy led to greater reduction of HbA1c levels compared to other treatments as was demonstrated in previous work [10, 11]. As such, insulin has been widely regarded as the most effective treatment approach for GDM since it is a hormone that directly lowers blood glucose levels [12]. However, it should be noted that subcutaneous injections are required for the administration of insulin, which may not be convenient or comfortable for patients. In contrast, oral antidiabetic medications such as metformin and glyburide offer an appealing alternative to insulin by being given through the mouth thus reducing risk of hypoglycemia [13]. We also found that oral antidiabetic medications effectively maintained fasting blood glucose within normal range which agrees with what other studies had found [14, 15]. Consequently, they should be considered as

options in the management of GDM especially if patients prefer oral medication or are unwilling to inject themselves with insulin. These include dietary changes and physical activity; these modifications cannot be ignored when dealing with GDM [16]. Our research established also showed lifestyle changes alone were used less frequently but controlled glucose levels in some cases. All the same, not all cases of GDM can be managed by lifestyle modifications alone hence they must always accompany other pharmacological interventions. Age distribution in our study sample reveals that majority were aged between 26-30 years which coincides perfectly with peak childbearing age recorded in various populations [17]. On the other hand GDM may affect any woman at any time during pregnancy which implies all these women should be screened early enough. Maternal and fetal outcomes are of paramount importance in GDM management. In this study, there were no significant differences between maternal and fetal outcomes among the various treatment groups. This is also consistent with other studies that showed achieving glycemic control rather than specific approaches was most important in cases of GDM [18]. However, it is important to recognize that individual patient factors like gestational age, health status, and compliance may affect outcomes leading to clinical decision-making. In conclusion, our study underscores the need for individualized treatment approaches in GDM management. These decisions should be guided by patient preferences, medical history and goals for blood sugar regulation. Future research needs to concentrate on revealing more about the long-term effects of different treatments on mothers together with their babies' health while thus optimizing GDM management strategies [19].

CONCLUSION:

Our study emphasises the need of customised treatment regimens for women with gestational diabetes mellitus. Although lifestyle

modifications and oral anti-diabetic drugs may result in successful glycemic control, insulin treatment still plays a significant role. Further studies examining the effects of these medicines on long-term hazards for mother and child are needed to determine how these treatments will benefit patients in the future.

Acknowledgement: We would like to thank the hospitals administration and everyone who helped us complete this study.

Disclaimer: Nil

Conflict of Interest: There is no conflict of interest.

Funding Disclosure: Nil

Authors Contribution

Khalid Usman¹, Concept & Design of Study

Mujeeb ur Rehman² .Drafting

Salman Kundi⁵ ,Arif Mumtaz³ .Data Analysis

Naseeb UrRehman⁴ .Revisiting Critically

Khalid Usman¹ ,Mujeeb ur Rehman² .Final Approval of version

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Acknowledgement: We would like to thank the hospitals administration and everyone who helped us complete this study.

Disclaimer: Nil

Conflict of Interest: There is no conflict of interest.

Funding Disclosure: Nil



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