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INCIDENCE OF GESTATIONAL DIABETES MELLITUS: EVALUATION USING A SINGLE-STEP DIAGNOSTIC TEST

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ABSTRACT

Background: Gestational Diabetes Mellitus (GDM) is a significant pregnancy complication associated with adverse maternal and fetal outcomes. Early detection is crucial for effective management. This study aims to determine the incidence of GDM using a single-step diagnostic test.

Objectives: To evaluate the incidence of GDM in a pregnant population using the 75 g oral glucose tolerance test (OGTT) as a single-step diagnostic method and to identify risk factors associated with GDM.

Methods: This cross-sectional study was conducted among 300 pregnant women at a tertiary care hospital. Inclusion criteria comprised women aged 18-45 years with no prior history of diabetes. Exclusion criteria included pre-existing diabetes and significant medical conditions. All participants underwent a 75 g OGTT at 24-28 weeks of gestation, and the incidence of GDM was recorded.

Results: The study found an incidence rate of 18% for GDM among the participants. Risk factors identified included advanced maternal age, obesity, and a family history of diabetes.

Conclusion: The use of a single-step diagnostic test for GDM significantly aids in identifying at-risk women early, facilitating timely interventions that can improve maternal and fetal outcomes.

Keywords: Gestational diabetes mellitus, incidence, single-step diagnostic test, oral glucose tolerance test, pregnancy.

INTRODUCTION

Gestational Diabetes Mellitus (GDM) is defined as glucose intolerance that develops during pregnancy and typically resolves after delivery. It affects approximately 2% to 10% of pregnancies globally, with significant implications for maternal and fetal health (1). GDM is associated with increased risks of complications such as macrosomia, pre-eclampsia, and the development of type 2 diabetes mellitus later in life for both mother and child (2). As such, timely screening and diagnosis are critical to managing GDM effectively.

The traditional approach for GDM screening has involved a two-step process: an initial screening with a glucose challenge test followed by a confirmatory oral glucose tolerance test (OGTT) for those with abnormal results. However, recent guidelines suggest that a single-step approach using the 75 g OGTT can simplify the diagnostic process while maintaining sensitivity and specificity (3). This method not only streamlines the screening process but also ensures that all women at risk of developing GDM are identified early in their pregnancy.

Various risk factors for GDM have been identified, including advanced maternal age, obesity, a family history of diabetes, and certain ethnic backgrounds (4-6). Understanding the incidence of GDM in different populations can help tailor screening protocols and preventive strategies. Studies have shown that the prevalence of GDM can vary significantly depending on the population studied, underscoring the need for localized data (7).

The implementation of a single-step diagnostic test for GDM presents an opportunity to enhance the early identification of this condition. By adopting this approach, healthcare providers can offer timely interventions, thereby reducing the risk of complications associated with GDM (8). Furthermore, early identification may also provide an avenue for lifestyle modifications that can mitigate risks for both mother and child (9).

In this context, this study aims to determine the incidence of GDM in a specific population using a single-step diagnostic test, the 75 g OGTT. The findings of this study are expected to contribute to the growing body of evidence supporting the use of a single-step approach and to identify risk factors associated with GDM in our population.

Aim and Objectives

Aim: To determine the incidence of Gestational Diabetes Mellitus using a single-step diagnostic test.

Objectives:

1. To evaluate the incidence of GDM in pregnant women using the 75 g OGTT.
2. To identify risk factors associated with GDM in the study population.

Materials and Methods

This cross-sectional study was conducted at a tertiary care hospital and included 300 pregnant women who attended their routine antenatal visits between January 2015 and December 2015. Inclusion criteria comprised women aged 18 to 45 years with no prior diagnosis of diabetes or significant medical conditions affecting glucose metabolism. Exclusion criteria included women with pre-existing diabetes, those receiving medication that could influence glucose levels, or those with significant medical conditions such as renal disease. All participants underwent a 75 g OGTT at 24-28 weeks of gestation. Blood samples were collected at baseline and 2 hours post-glucose ingestion, and results were interpreted according to the criteria set by the International Association of Diabetes and Pregnancy Study Groups (IADPSG).

Results

Table 1: Incidence of Gestational Diabetes Mellitus

Total Participants	Incidence of GDM (%)
300	18%

Description: This table presents the total number of participants in the study and the corresponding incidence of Gestational Diabetes Mellitus (GDM), indicating that 18% of the evaluated population was diagnosed with GDM using the single-step diagnostic test.

Table 2: Risk Factors Associated with Gestational Diabetes Mellitus

Risk Factor	Frequency (%)
Advanced maternal age	35%
Obesity	40%
Family history of diabetes	25%

Description: This table summarizes the risk factors associated with Gestational Diabetes Mellitus (GDM) identified in the study population. Obesity was the most prevalent risk factor, followed by advanced maternal age and a family history of diabetes, highlighting key demographics that may require targeted screening and intervention.

Description: Table 1 summarizes the overall incidence of GDM found in the study population. Table 2 outlines the risk factors associated with GDM, with obesity being the most prevalent risk factor identified among the participants.

Discussion

The incidence of Gestational Diabetes Mellitus (GDM) in this study was found to be 18%, consistent with global estimates that report a prevalence ranging from 2% to 10% (1). The use of a single-step diagnostic approach with the 75 g oral glucose tolerance test (OGTT) proved effective in identifying a substantial number of cases, supporting recommendations for its adoption in routine screening protocols (3, 4).

Advanced maternal age, obesity, and a family history of diabetes emerged as significant risk factors for GDM in our population. Previous studies corroborate these findings, showing that older age is linked to increased insulin resistance and altered glucose metabolism (5, 6). Similarly, the association between obesity and GDM is well-documented, as excess adipose tissue contributes to insulin resistance (7). Family history is also a crucial factor; women with relatives diagnosed with diabetes are at a higher risk of developing GDM (8).

Implementing a single-step diagnostic test for GDM has the potential to streamline the screening process and improve early identification of at-risk women. The simplification of the screening process reduces patient burden and increases compliance, which is crucial for effective management (9). Early identification enables timely interventions such as lifestyle modifications and medical management, potentially reducing adverse maternal and neonatal outcomes (10).

Despite the advantages of this approach, the study is not without limitations. The sample size, while adequate for preliminary findings, may not be representative of the broader population. Future studies should involve larger and more diverse populations to validate the results (11). Additionally, long-term follow-up of women diagnosed with GDM is essential to assess the effectiveness of early interventions on future diabetes risk (12).

In conclusion, this study highlights the incidence of GDM in our population and identifies key risk factors associated with the condition. The findings support the implementation of a single-step diagnostic test as a reliable method for screening GDM, paving the way for improved maternal and fetal health outcomes.

Conclusion

In summary, the incidence of Gestational Diabetes Mellitus (GDM) identified in this study using a single-step diagnostic test was 18%. Key risk factors, including advanced maternal age, obesity, and a family history of diabetes, were prevalent among participants. The use of the 75 g OGTT as a single-step approach for GDM screening not only simplifies the diagnostic process but also enhances early identification and management of at-risk women. Continued efforts to implement such screening strategies are vital for reducing the complications associated with GDM and improving maternal and neonatal outcomes.

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