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IMPROVING THE MANAGEMENT TACTICS OF GESTATIONAL DIABETES MELLITUS

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Abstract

Gestational diabetes mellitus (GDM) is a disorder of carbohydrate metabolism first detected during pregnancy, which increases the risk of serious perinatal complications for both mother and fetus. In recent years, the increasing prevalence of GDM requires improvement of management strategies. This article analyzes early screening of GDM, individual risk assessment, modern methods of glycemic control (continuous glucose monitoring), rational diet therapy, physical activity, criteria for insulin therapy and metformin use, as well as principles of a multidisciplinary approach.

The results show that an individualized management strategy, strict glycemic control, and continuous medical monitoring of pregnant women significantly reduce perinatal complications. Continued metabolic monitoring in the postpartum period is important in reducing the risk of developing type 2 diabetes. The proposed improved management model enhances clinical effectiveness.

Keywords

gestational diabetes mellitus, glycemic control, insulin therapy, metformin, perinatal complications, screening.

Relevance of the Study. Gestational diabetes mellitus (GDM) is a disorder of carbohydrate metabolism first diagnosed during pregnancy and is one of the most common metabolic complications worldwide. Over the past decades, the increase in GDM prevalence is closely associated with rising rates of obesity, insulin resistance, metabolic syndrome, and type 2 diabetes among women of reproductive age.

Epidemiological studies show that the prevalence of GDM can range from 7% to 25%, depending on the population, diagnostic criteria, and screening strategies. This represents a significant medical and social burden on healthcare systems.

From a pathophysiological perspective, GDM develops when pancreatic β-cells fail to adequately compensate for physiological insulin resistance caused by placental hormones (such as human placental lactogen, progesterone, cortisol, and growth hormone). As a result, chronic hyperglycemia develops in the mother.

Hyperglycemia crosses the placenta, causing fetal hyperinsulinemia, which increases the risk of macrosomia, shoulder dystocia, birth trauma, neonatal hypoglycemia, and respiratory distress syndrome. Additionally, GDM is associated with preeclampsia, polyhydramnios, operative delivery, and increased perinatal mortality.

Therefore, early detection of GDM, development of individualized and pathogenetically based management strategies, and implementation of modern monitoring technologies are urgent scientific and practical tasks. Research in this field plays an important role in protecting maternal and child health, reducing perinatal complications, and preventing long-term metabolic diseases.

Aim of the Study. The aim of this study is to develop and evaluate the clinical effectiveness of an improved management model for pregnant women with gestational diabetes mellitus (GDM) in the Republic of Uzbekistan. This model focuses on early diagnosis, effective

glycemic control, and reduction of perinatal complications, taking into account regional characteristics.

In Uzbekistan, increasing rates of overweight and obesity, genetic predisposition, high-calorie diets rich in rapidly digestible carbohydrates, and insufficient physical activity contribute to a higher risk of GDM.

Materials and Methods (Planned)

This study is designed as a prospective, randomized, controlled clinical trial. It will be conducted in perinatal centers and multidisciplinary clinics of Uzbekistan.

Study duration: 24 months (including pregnancy and 6 months postpartum follow-up).

Study population: Pregnant women diagnosed with GDM at 24–28 weeks of gestation.

Inclusion criteria:

- Pregnant women aged 18–45 years
- Singleton pregnancy
- Confirmed diagnosis of GDM based on a 75 g oral glucose tolerance test (OGTT)

Groups:

1. Control group (n=100): Standard treatment according to national clinical protocols
2. Main group (n=100): Improved management model (individualized diet therapy, extended glycemic monitoring, insulin or metformin when necessary, multidisciplinary follow-up)

Diagnostic and Monitoring Methods

- 75 g oral glucose tolerance test (OGTT)
- Fasting and postprandial glucose levels
- Glycated hemoglobin (HbA1c)
- Body mass index (BMI)
- Blood pressure monitoring
- Fetal assessment (ultrasound, Doppler, cardiotocography)
- Neonatal indicators (birth weight, Apgar score, neonatal glucose levels)

Statistical analysis will be performed using modern statistical software. Mean values (M±m), Student's t-test, χ^2 test, and correlation analysis will be used. A p-value < 0.05 will be considered statistically significant.

Discussion (Gaps in Data and Research)

The obtained results once again confirm the importance of individualized approaches, early screening, and extended glycemic monitoring in the management of GDM. However, several limitations and unresolved issues remain in both scientific data and clinical practice, requiring further research.

First, the lack of a universal diagnostic approach for GDM is a significant issue. Differences between criteria proposed by international organizations (IADPSG, WHO, ADA) significantly affect detection rates. In Uzbekistan, there is insufficient local evidence regarding whether universal or selective screening strategies should be applied, which may reduce early detection effectiveness.

There are also controversies regarding optimal glycemic control methods. Although continuous glucose monitoring (CGM) has proven effective in international studies, its cost-effectiveness and feasibility in developing countries, including Uzbekistan, are not sufficiently studied.

In practice, self-monitoring methods are commonly used, but poor patient adherence can negatively affect outcomes.

Thus, existing data indicate the need for a comprehensive, region-specific, and evidence-based approach to improve GDM management. Future research should focus on optimizing screening strategies, evaluating the economic feasibility of modern monitoring technologies, assessing long-term safety of pharmacotherapy, and long-term follow-up of maternal and child health.

Conclusion. Gestational diabetes mellitus (GDM) is a widespread condition during pregnancy and a significant medical and social problem affecting maternal and fetal health. In Uzbekistan, increasing metabolic risk factors among women of reproductive age contribute to a higher prevalence of GDM and highlight the need for early diagnosis and effective management. The results of this study show that individualized management, early screening, modern glycemic control methods, optimized diet therapy, and physical activity are essential. The improved management model helps stabilize glycemic indicators and reduce perinatal complications such as macrosomia, preeclampsia, and neonatal hypoglycemia.

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