# GESTATIONAL DIABETES MELLITUS AND CHARACTERISTICS OF PREGRAVID HISTORY: A RETROSPECTIVE ANALYSIS

**Shavazi Nargiz Nuraliyevna**
*DSc, Associate Professor, Head of the Department of Obstetrics and Gynecology No. 3, Samarkand State Medical University*
*https://orcid.org/ 0000-0003-0724-537X*
**Ilkhomova Malika Ravshanovna**
*1st year Master's Student, Department of Obstetrics and Gynecology No. 3, Samarkand State Medical University*
*https://orcid.org/0009-0004-0035-4682*

**Abstract.** Gestational diabetes mellitus is one of the most common metabolic complications of pregnancy and is associated with adverse obstetric, perinatal, and long-term metabolic outcomes. Despite standardized screening programs, the increasing incidence of gestational diabetes mellitus highlights the significant role of pregravid risk factors formed before pregnancy. A retrospective analysis of medical records of 50 pregnant women with gestational diabetes mellitus observed at Maternity Complex No. 1 in Samarkand was performed. Anthropometric parameters, pre-pregnancy body mass index, presence of extragenital pathology, characteristics of gynecological and reproductive history, as well as the scope of pregravid assessment were evaluated. The mean age of patients was 31.2 ± 5.1 years. Pre-pregnancy overweight and obesity were identified in 94.0% of women, and extragenital pathology in 92.0%. A combination of three or more pregravid risk factors was observed in 72.0% of patients, whereas an isolated dominant risk factor was identified in only 10.0% of cases. The obtained data indicate that gestational diabetes mellitus in most women develops against the background of a combination of pregravid risk factors, predominantly of metabolic and somatic nature. The results emphasize the need for an expanded and comprehensive approach to women's health assessment at the stage of pregnancy planning to enable early identification of high-risk groups and optimization of preventive measures.

**Keywords:** gestational diabetes mellitus; pregnancy; pregravid risk factors; pregravid care; body mass index.

**Аннотация.** Гестационный сахарный диабет является одним из наиболее распространённых метаболических осложнений беременности и ассоциирован с неблагоприятными акушерскими, перинатальными и отдалёнными метаболическими исходами. Несмотря на стандартизированные программы скрининга, рост частоты гестационного сахарного диабета подчёркивает значимую роль прегравидарных факторов



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риска, формирующихся до наступления беременности. Проведён ретроспективный анализ медицинской документации 50 беременных женщин с гестационным сахарным диабетом, наблюдавшихся в Родильном комплексе № 1 города Самарканда. Оценивались антропометрические показатели, индекс массы тела до беременности, наличие экстрагенитальной патологии, особенности гинекологического и репродуктивного анамнеза, а также объём прегравидарного обследования. Средний возраст пациенток составил 31,2 ± 5,1 года. Избыточная масса тела и ожирение до беременности выявлены у 94,0% женщин, экстрагенитальная патология — у 92,0%. Сочетание трёх и более прегравидарных факторов риска отмечено у 72,0% пациенток, тогда как изолированный доминирующий фактор выявлялся лишь в 10,0% случаев. Полученные данные свидетельствуют о том, что гестационный сахарный диабет у большинства женщин формируется на фоне совокупности прегравидарных факторов риска преимущественно метаболического и соматического характера. Результаты подчёркивают необходимость расширенного и комплексного подхода к оценке состояния здоровья женщины на этапе планирования беременности с целью раннего выявления группы высокого риска и оптимизации профилактических мероприятий.

**Ключевые слова**: гестационный сахарный диабет; беременность; прегравидарные факторы риска; прегравидарная подготовка; индекс массы тела.

**Annotatsiya.** Gestatsion qandli diabet homiladorlik davrida uchraydigan eng ko‘p tarqalgan metabolik asoratlardan biri bo‘lib, noqulay akusherlik, perinatal va uzoq muddatli metabolik oqibatlar bilan bog‘liq. Standart skrining dasturlariga qaramay, gestatsion qandli diabet uchrash chastotasining oshib borishi homiladorlikdan oldin shakllanadigan pregravidar xavf omillarining muhim rolini ko‘rsatadi. Tadqiqotda Samarkand shahridagi 1-sonli Tug‘ruq majmuasida kuzatuvda bo‘lgan gestatsion qandli diabet bilan kasallangan 50 nafar homilador ayolning kasallik tarixlari retrospektiv tahlil qilindi. Antropometrik ko‘rsatkichlar, homiladorlikdan oldingi tana massasi indeksi, ekstragenital patologiya mavjudligi, ginekologik va reproduktiv anamnez xususiyatlari hamda pregravidar tekshiruv hajmi baholandi. Bemorlarning o‘rtacha yoshi 31,2 ± 5,1 yilni tashkil etdi. Homiladorlikdan oldin ortiqcha vazn va semirish 94,0% ayollarda, ekstragenital patologiya esa 92,0% holatda aniqlangan. Uch va undan ortiq pregravidar xavf omillarining kombinatsiyasi 72,0% bemorlarda qayd etilgan, yagona ustun xavf omili esa faqat 10,0% holatda aniqlangan. Olingan ma’lumotlar gestatsion qandli diabet ko‘pchilik hollarda asosan metabolik va somatik xarakterdagi bir nechta pregravidar xavf



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omillari fonida rivojlanishini ko‘rsatadi. Natijalar homiladorlikni rejalashtirish bosqichida ayol salomatligini kengaytirilgan va kompleks baholash zarurligini, yuqori xavf guruhlarini erta aniqlash va profilaktik choralarni optimallashtirish uchun muhim ekanligini tasdiqlaydi.

**Kalit so‘zlar:** gestatsion qandli diabet; homiladorlik; pregravidar xavf omillari; pregravidar tayyorgarlik; tana massasi indeksi.

## INTRODUCTION

Gestational diabetes mellitus (GDM) is one of the most common metabolic complications of pregnancy and, according to various population-based studies, is diagnosed in **7–14% of pregnant women**, with substantial variability depending on ethnic, socioeconomic, and diagnostic criteria [1,2]. The development of GDM is associated with an increased incidence of adverse obstetric and perinatal outcomes, including preeclampsia, fetal macrosomia, operative delivery, neonatal hypoglycemia, and the development of long-term metabolic disorders in both the mother and the child [1,2].

Despite the implementation of unified diagnostic algorithms and standardized screening programs for disorders of carbohydrate metabolism during pregnancy, including those based on the oral glucose tolerance test, the detection rate of GDM demonstrates a **steady upward trend**, increasing on average by **10–15% over recent decades** [1]. This dynamic cannot be explained solely by improvements in diagnostic approaches and indicates the growing importance of risk factors that develop long before the onset of pregnancy.

In current clinical practice, the assessment of GDM risk is primarily focused on anthropometric parameters, particularly body mass index, as well as the results of the glucose tolerance test performed in the second trimester of pregnancy [3,4]. However, this strategy is mainly aimed at identifying already established disturbances of carbohydrate metabolism, while a comprehensive assessment of the somatic, endocrine, and reproductive status of women at the stage of pregnancy planning often remains fragmented or formal [5,6].

Based on accumulated evidence, gestational diabetes mellitus is increasingly regarded not only as a transient complication of pregnancy but also as a **clinical marker of an unfavorable metabolic background**, reflecting insufficient identification and correction of pregravid risk factors. This concept is supported by studies indicating a high risk of developing type 2 diabetes mellitus, metabolic syndrome, and cardiovascular diseases in women with a history of GDM in subsequent years of life [7,8].

In this context, the analysis of the structure and combination of pregravid risk factors in women with gestational diabetes mellitus is of particular relevance,



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allowing GDM to be considered within a broader clinical and pathogenetic framework and substantiating the need for early preventive interventions already at the stage of pregnancy planning.

## AIM OF THE STUDY

To assess the structure and prevalence of pregravid risk factors in women with gestational diabetes mellitus and to analyze their combination and clinical-anamnestic characteristics preceding the development of carbohydrate metabolism disorders during pregnancy.

## MATERIALS AND METHODS

The study was conducted as a **retrospective observational analysis** at the **Maternity Complex No. 1 of the city of Samarkand**. The study included **50 pregnant women** diagnosed with gestational diabetes mellitus who were under observation and treatment at this institution.

The analysis comprised evaluation of **clinical and anamnestic data**, including patients' age, pre-pregnancy body mass index, presence of extragenital pathology, harmful habits, and features of gynecological and reproductive history.

Anthropometric parameters were assessed by calculating body mass index (BMI) according to the Quetelet formula. Overweight was defined as a BMI of 25.0–29.9 kg/m², and obesity as a BMI ≥ 30 kg/m².

Gynecological history was analyzed, including previous inflammatory diseases of the pelvic organs, sexually transmitted infections, intrauterine interventions, and surgical procedures on the pelvic organs. Endometrial status was evaluated based on pelvic ultrasound findings.

Reproductive history was assessed with consideration of medical abortions, reproductive losses, and complications during pregnancy. Episodes of threatened miscarriage requiring inpatient treatment were analyzed separately.

When analyzing anamnestic data, **long-term medication use** associated with the treatment of chronic somatic diseases and potentially affecting metabolic status was taken into account.

Assessment of autoimmune status as part of pregravid preparation was **not performed in any of the examined patients**.

Statistical analysis was **descriptive** in nature. Quantitative variables were presented as mean ± standard deviation (M ± SD), while categorical variables were expressed as absolute numbers and percentages (%).

## RESULTS

The mean age of the examined women was **31.2 ± 5.1 years** (range 21–41 years). Overweight (BMI 25.0–29.9 kg/m²) was identified in 26 patients (52.0%), and obesity (BMI ≥ 30 kg/m²) in 21 women (42.0%). The mean BMI was **27.4 ±**



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**3.6 kg/m²**, with a maximum value of 36.5 kg/m². Thus, BMI exceeded 25 kg/m² in 47 patients (94.0%).

Chronic extragenital diseases were recorded in 46 women (92.0%). Harmful habits, including smoking, excessive caffeine consumption, or the use of medications without medical supervision, were noted in 15 patients (30.0%).

A burdened gynecological history was identified in a significant proportion of the examined women. A history of sexually transmitted infections and/or inflammatory pelvic diseases was present in 28 women (56.0%). According to ultrasound examination, subjective signs of chronic endometritis were observed in 34 patients (68.0%), reflecting a high prevalence of gynecological pathology in the study group.

Reproductive history was characterized by a high frequency of intrauterine interventions: separate diagnostic curettage of the uterus was reported in 41 women (82.0%), and medical termination of pregnancy for medical indications in 20 patients (40.0%). Surgical interventions on the pelvic organs were performed in 24 women (48.0%). Reproductive losses were documented in 39 patients (78.0%).

**Table-1.**

**Clinical and Anamnestic Characteristics of the Study Group (n = 50)**

| Parameter | Value |
|---|---|
| **Age, years (M ± SD)** | 31.2 ± 5.1 |
| Age range, years | 21–41 |
| **Body mass index, kg/m² (M ± SD)** | 27.4 ± 3.6 |
| Maximum BMI, kg/m² | 36.5 |
| Overweight (BMI 25.0–29.9 kg/m²), n (%) | 26 (52.0) |
| Obesity (BMI ≥ 30 kg/m²), n (%) | 21 (42.0) |
| BMI > 25 kg/m², n (%) | 47 (94.0) |
| **Extragenital pathology**, n (%) | 46 (92.0) |
| **Harmful habits***, n (%) | 15 (30.0) |
| **Gynecological history** | |
| History of STIs and/or pelvic inflammatory disease, n (%) | 28 (56.0) |



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| | |
|---|---|
| Ultrasound signs of chronic endometritis, n (%) | 34 (68.0) |
| **Reproductive history** | |
| Separate diagnostic curettage of the uterus, n (%) | 41 (82.0) |
| Medical termination of pregnancy, n (%) | 20 (40.0) |
| Pelvic surgical interventions, n (%) | 24 (48.0) |
| History of reproductive losses, n (%) | 39 (78.0) |
| **Long-term medication use**, n (%) | 16 (32.0) |
| Threatened miscarriage requiring hospitalization, n (%) | 39 (78.0) |
| **Autoimmune status not assessed**, n (%) | 50 (100) |
| **≥ 3 pregravid risk factors**, n (%) | 36 (72.0) |
| Single dominant risk factor, n (%) | 5 (10.0) |

Long-term medication use related to chronic somatic diseases was noted in 16 women (32.0%). Threatened miscarriage requiring inpatient treatment occurred in 39 patients (78.0%).

It should be noted that **assessment of autoimmune status** as part of pregravid preparation was not performed in any patient.

Analysis of the combined risk factors showed that 36 women (72.0%) had **three or more pregravid risk factors**, whereas only 5 patients (10.0%) had a single dominant factor without associated disorders.

## DISCUSSION

The obtained results indicate that gestational diabetes mellitus in most examined women developed against the background of a **combination of multiple pregravid risk factors**, rather than the isolated effect of a single unfavorable factor. The high prevalence of overweight and obesity confirms their leading role in the structure of GDM risk factors, which is consistent with contemporary data on the significance of insulin resistance and metabolic disturbances in the pathogenesis of the disease.

At the same time, the widespread occurrence of extragenital pathology and an unfavorable reproductive history indicates the **multicomponent nature of the clinical background** on which carbohydrate metabolism disorders developed.



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These features reflect the overall somatic and reproductive health status of the examined women and may be regarded as markers of an unfavorable premorbid background.

Gynecological diseases and features of reproductive history were considered in this study exclusively as characteristics of reproductive status and were not interpreted as etiological factors in the development of gestational diabetes mellitus. Nevertheless, their high prevalence emphasizes the need for a more thorough, comprehensive, and systematic assessment of women's health at the stage of pregnancy planning.

The absence of autoimmune status assessment in all patients indicates **limitations in the scope of pregravid diagnostics** and may be regarded as a potential diagnostic gap affecting the timely identification of women at high risk and the implementation of preventive measures.

## CONCLUSIONS

In the studied group of women with gestational diabetes mellitus, a combination of several pregravid risk factors predominated, with the majority of patients presenting three or more unfavorable factors.

Pre-pregnancy overweight and obesity were identified in the vast majority of women and represented the most common metabolic characteristics within the risk factor structure.

Extragenital pathology and an unfavorable reproductive history were frequently observed and characterized the general somatic and reproductive health status, without establishing a causal relationship with the development of gestational diabetes mellitus.

Assessment of autoimmune status was not performed as part of pregravid preparation, reflecting a limited scope of pregestational diagnostics in the observed cohort.

The obtained results confirm the need for an expanded and comprehensive approach to the assessment of pregravid risk factors in women planning pregnancy.

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