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Systematic review of gestational diabetes and mental health Sequelae among Pregnant Women

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ABSTRACT

GDM pregnant women with anxiety and depression were more likely to have adverse outcomes in terms of blood glucose during pregnancy, delivery mode, and maternal and infant outcomes. The diagnosis of gestational diabetes and various factors affecting pregnant women with GDM themselves play a role. As a result, with the increase in the incidence of GDM, the psychological problems of GDM patients also deserve attention. Active and effective psychological intervention measures should be taken to help GDM pregnant women pass the pregnancy period safely and achieve better pregnancy outcomes.

Keywords: pregnant women, diabetes, gestational diabetes and mental health.

INTRODUCTION

Gestational diabetes mellitus (GDM) is defined as carbohydrate intolerance resulting in hyperglycemia with first onset or detection during pregnancy, accounting for 86% of hyperglycemia during pregnancy [1-2]. Compared to healthy pregnant women, pregnant women with GDM are more likely to develop maternal and infant complications and are more likely to develop type 2 diabetes cardiovascular disease, dyslipidemia, and metabolic disorders after delivery [3]. The mental health problems of pregnant women, especially the mental state of GDM, a high-risk group, have attracted a great attention from scholars all over the world. Studies in this population show that apart from physiological factors, anxiety and depression are also important causes of gestational diabetes. However, there is no unified conclusion regarding the correlation between anxiety and depression and GDM. On the one hand, the study found that anxiety and depression can lead to chronic hypothalamic-pituitary-adrenal hyperactivity, resulting in increased release of cortisol and insulin resistance, increasing risk of developing GDM in pregnant women. At the same time, the diagnosis of GDM may increase the risk of antenatal or postnatal depression through a reverse mechanism. This suggests that there may be a two-way relationship between gestational diabetes and anxiety and depression [4]. However, on the other hand, some studies believe that anxiety and depression do not increase the incidence of GDM in pregnant women [5-9], and the diagnosis of GDM does not increase the risk of prenatal or postnatal depression. There is currently no consensus on the relationship between anxiety and depression and GDM. We therefore conducted a systematic review of the relevant literature to further explore the bidirectional relationship between anxiety and depression and GDM. At the same time, we further studied the effects of anxiety and depression on blood glucose and maternal and infant outcomes in pregnant women with GDM and discussed the sources of anxiety and depression and related treatment measures [10].

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Gestational Diabetes Mellitus

Gestational Diabetes Mellitus (GDM) is a common medical disorder among pregnant women, affecting approximately 14% of pregnant women. GDM is defined as a transitory form of glucose intolerance, induced by insulin resistance and pancreatic β -cell dysfunction during pregnancy. It is a complex maternal health condition associated with short and long-term complications. Risk factors associated with GDM include family history of diabetes, smoking, ethnicity advancing maternal age and polycystic ovarian syndrome. In particular, obesity could induce chronic background insulin resistance, mediating metabolically induced inflammation along with placental hormones that contribute to a state of insulin resistance. Thus, obese women are particularly susceptible to GDM [11-14]. GDM is commonly associated with an increased risk of type 2 Diabetes Mellitus (DM) in later life with risk factors for both conditions broadly similar. As observed in type 2 diabetes, a major determinant for developing GDM is ethnic origin. 15% of women with a South Asian heritage may develop this complication whilst Caucasian women may only be affected in 3% of cases. The presence of multiple risk factors does not reliably predict the risk of incidence of GDM. GDM has multiple adverse implications for both mother and infant including hypertension, polyhydramnios and preterm labor in mother, and fetal macrosomia, birth injury, respiratory distress and hypoglycemia in the infant. Long-term consequences including development of type 2 DM and cardiovascular disease in women with GDM and metabolic syndrome in infants of mothers with GDM have also been reported [15].

Gestational Diabetes Mellitus Pathophysiology

During pregnancy, the placenta produces hormones that can cause insulin resistance, leading to high blood sugar levels in the mother. In response, the pancreas produces more insulin to try to regulate the blood sugar levels. However, in some women, the pancreas is unable to produce enough insulin to compensate for the increased insulin resistance, resulting in GDM. The increased blood sugar levels in GDM can have several effects on the mother and fetus. High blood sugar levels can increase the risk of complications during pregnancy, such as preeclampsia, preterm labor, and cesarean delivery. High blood sugar levels can also increase the risk of macrosomia, which is when the baby is larger than normal, leading to a difficult delivery and an increased risk of birth injuries. In addition, high blood sugar levels can have long-term effects on both the mother and the child. Women with GDM have an increased risk of developing type 2 diabetes later in life, while children born to mothers with GDM are at an increased risk of developing obesity and type 2 diabetes later in life [16].

Gestational diabetes mellitus risk factors

Gestational diabetes mellitus (GDM) is a type of diabetes that occurs during pregnancy. The following are some of the risk factors that increase the likelihood of developing GDM: Overweight or obese before pregnancy: Women who have a body mass index (BMI) of 25 or higher before pregnancy are at a greater risk of developing GDM. Age: Women who are 25 years or older are at a higher risk of developing GDM. Family history: If a woman's parent or sibling has diabetes, she is more likely to develop GDM. Previous history of GDM: Women who have had GDM in a previous pregnancy are more likely to develop it in subsequent pregnancies. Polycystic ovary syndrome (PCOS): Women with PCOS are at a higher risk of developing GDM. Certain ethnic groups: Women who are of Hispanic, African American, Native American, or Asian descent are at a higher risk of developing GDM. High blood pressure: Women with high blood pressure are at a higher risk of developing GDM. Previous delivery of a large baby: Women who have previously given birth to a baby weighing 9 pounds or more are at a higher risk of developing GDM. It's important to note that having one or more of these risk factors does not necessarily mean that a woman will develop GDM. However, it is important for women who have any of these risk factors to be aware of the signs and symptoms of GDM and to talk to their healthcare provider about their risk [17].

Gestational Diabetes Mellitus and Mental Health Causation

A growing body of literature suggests the association between GDM and the subsequent development of mental health (MH) symptomatology, notably depression and anxiety with pooled prevalence of depression particularly being reported at 28%, although pathophysiological aspects remain unclear. Women with GDM are 2 to 4 times more likely to develop depression in the antenatal or postnatal periods in comparison to those without GDM. The World Health Organization's (WHO) 'Women's Health Report' published in 2016 demonstrates a higher incidence of MH issues amongst women in the reproductive ages (18 to 49 years) although, the data for MH sequelae associated with GDM is lacking [18-23].

Diagnosis and treatments

For GDM women from Black, Asian and Minority Ethnic (BAME) backgrounds that report MH symptomatology or have psychiatric conditions, remain non-specific. Pregnancy associated hormonal changes may attribute to emotional distress based on patient reported outcomes. There are various forms of psychological distress such as diabetes-specific emotional distress, defined as negative emotions or fear related to lived experiences and coping

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mechanisms Alterations to mood could be attributed to hypothalamic-pituitary-adrenal axis dysfunction There is some evidence to support an association between GDM and the onset of MH disorders, although this relationship could be bi-directional Despite unclear inflammatory pathways, elevated levels of pro-inflammatory cytokines have been observed in both GDM and depression patients [24]. Given that pregnancy is commonly associated with heightened emotions, an additional GDM diagnosis could increase psychological strain. Psychosocial dynamics such as social media could further impact mental and physical health of these women. Both, MH conditions and GDM have been demonstrated to disproportionately affect those from BAME communities. BAME women may endeavor additional challenges with accessing culturally responsive antenatal care associated with GDM and MH support due to a multitude of reasons albeit, perceptions and stigmatization being primary factors. Prospective data associated with the potential sequelae shared between GDM and MH remains limited [25]. Challenges around undiagnosed psychiatric conditions such as post-traumatic stress disorders (PTSD) and schizophrenia could result in exacerbation of secondary conditions such as GDM and vice versa. This may be heightened among the BAME population experiencing racial discrimination or inequalities leading to mistrust of healthcare services. It is reported, stigmatization faced by certain ethnic minorities may result in the worsening of emotional wellbeing leading to barrier these issues may impact the therapeutic rapport between the patient and healthcare professionals it has been reported that BAME women are less likely to receive the culturally responsive MH support compared to Caucasian women. This may pose severe consequences as untreated depression in pregnancy has been associated with adverse pregnancy outcomes. Pregnancies complicated by GDM as well as MH symptomatology would be deemed high-risk and require specialist support from multiple clinical specialists of endocrinologists, psychiatrists and obstetricians [26].

Gestational diabetes mellitus prevention

Gestational diabetes mellitus (GDM) is a type of diabetes that occurs during pregnancy. It can increase the risk of complications for both the mother and the baby, including pre-eclampsia, premature delivery, and a higher risk of developing type 2 diabetes later in life. Maintaining a healthy weight before and during pregnancy: Women who are overweight or obese before pregnancy have a higher risk of developing GDM. Maintaining a healthy weight through a balanced diet and regular exercise can help reduce the risk. Eating balanced diet: Eating a balanced diet that is rich in whole grains, fruits, vegetables, lean protein, and healthy fats can help reduce the risk of GDM. Avoiding sugary foods and drinks is also important. Regular exercise: Regular physical activity, such as walking, swimming, or yoga, can help reduce the risk of GDM. It is important to consult with a healthcare provider before starting any exercise program during pregnancy. Managing stress: Stress can affect blood sugar levels, so managing stress through relaxation techniques such as meditation or deep breathing can help reduce the risk of GDM. Prenatal care: Regular prenatal care can help identify and manage GDM early on, reducing the risk of complications for both the mother and the baby. Screening: All pregnant women should be screened for GDM between 24 and 28 weeks of pregnancy. If a woman has a higher risk of developing GDM, her healthcare provider may recommend screening earlier in pregnancy [27-38].

CONCLUSION

Anxiety or depression during pregnancy increases the incidence of GDM in pregnant women to a certain extent. GDM pregnant women with anxiety and depression were more likely to have adverse outcomes in terms of blood glucose during pregnancy, delivery mode, and maternal and infant outcomes. With the increase in the incidence of GDM, the psychological problems of GDM patients also deserve attention. Active and effective psychological intervention measures should be taken to help GDM pregnant women pass the pregnancy period safely and achieve better pregnancy outcomes.

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