The association of stress, HTN and DM during pregnancy

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Abstract

Introduction: Along standing hypothesis is that individuals who are prone to frequent, large increases in blood pressure (BP) during psychological stress are at risk for developing essential hypertension. However, after many years of investigation, a clear understanding of the etiologic role of stress responses has not emerged. The impact of a diagnosis of GDM may lead to increased stress in pregancy due to the demands of adherence to a treatment regimen and maternal concern about adverse outcomes for the mother and baby. studies indicates that the experience of GDM appears to be associated with increased psychological distress in comparison to the experience of non-diabetic pregnant women. This may indicate the need for psychological screening in GDM and the provision of psychological support in some cases.

Materials and method: The present study was conducted by searching both English and Persian databases including magiran, SID, Google scholars, and science direct pub med by using keywords such as stress, hypertention, gestational diabetes , pregnancy ,review. At first, the researcher searched a large number of studies. Then, from among the studies searched, those that were not related to the subject of the present study were removed, and the researcher used only those studies having a proper relationship with the present study. In the present study, it was attempted to investigate the association of stress ,HTN and DM during pregnancy.

Discussion: The persistence of the stressful factor destroys body resources and makes the person vulnerable against diseases and may cause physical disorders such as obesity, resistance to insulin, metabolic syndrome, gastrointestinal ulcers, hypertension, and cardiovascular diseases. Increased blood pressure is an important problem during pregnancy. Gestational hypertension and proteinuria are known as preeclampsia syndrome which occurs in 2-8% of pregnancies and is the direct cause of 10-15% of maternal mortalities in all countries with low, medium, and high incomes. Preeclampsia is related to preterm delivery, low weight of the baby at birth, intrauterine growth restriction, and fetus and infant mortalities. Measuring blood pressure is a common screening test in pre-delivery healthcare which is used to diagnose or predict the hypertension disease.

Keywords: stress, hypertention , gestational diabetes, pregnancy, review

Introduction

World health statistics reported the incidence of diabetes and glucose tolerance disorder in people of the age group 20-79 years old in the year 2010 to be 6.6% and 7.9%, respectively. It is estimated that by the year 2030 the figures for the two complications mentioned above will have reached 7.8% and 8.4%, respectively (1). In the year 2010, 900 million people are estimated to be suffering from the diabetes disease. Pregnant women are one of the groups that face a higher risk of

developing diabetes (2).Gestational diabetes means the beginning or the first stage of glucose intolerance diagnosis during pregnancy (3). Diabetes is the most common medical complication and the most common endocrine disease during pregnancy which is observed in tow forms: it is diagnosed either before pregnancy (overt diabetes) or during pregnancy (gestational diabetes). The incidence of mellitus gestational diabetes that causes complications has increased by 40% from 1989 to 200 (3, 4).Around 1-14% of pregnancies are diagnosed with mellitus diabetes, of which 3-5% are gestational diabetes cases. Diagnosing gestational diabetes can be helpful in diagnosing patients who may develop type 2 diabetes in the future. Proper medication and reducing blood glucose during pregnancy reduces potential complications (5). Due to the effects of human placenta lactose and progesterone, natural pregnancy increases resistance to insulin and results in hyperinsulinemia. If insulin store is inadequate, gestational diabetes develops, which usually happens at the end of the second three-month of pregnancy (6). Iran is a developing country with limited economic resources and a young population, of which 11 million people are women at fertility ages who face the risk of gestational diabetes. Given that this disease has no symptoms and at the same time cause several complications, it is necessary to control blood glucose in pregnant women and to identify people exposed to the risk of gestational diabetes and also to take quick measures for treating and taking care of people who are diagnosed with the disease (7). There is not an accurate test to diagnose patients with gestational diabetes. Therefore, different methods are used to screen these patients, one of them being the initial one-hour glucose challenge test or GCT to diagnose gestational diabetes mellitus (GDM). Other methods have also been suggested. In a study in France, testing fasting blood glucose and two hours after breakfast was considered to be the most accurate test. However, there is still no method that can diagnose the disease in pregnant women with certainty and quickly (8).Different studies have mentioned several risk factors for gestational diabetes. An awareness of these factors on the part of medical care personnel and increasing pregnant women's awareness of the

risk factors can be an important step in decreasing the incidence of this disease. The results of a study showed that there is a significant relationship between gestational diabetes and obesity, history of stillbirth, old age, history of abortion, history of infertility, history of diabetes in family members, and history of high blood pressure, and that these factors are the most important risk factors of the disease in that region (9). Gestational diabetes is associated several complication before, during, and after pregnancy, and there is minor disagreement on the potential incidence of fetal and maternal complications in gestational diabetes. Although the incidence of fetal, infantile, and maternal complications is higher women diagnosed with gestational diabetes than other pregnant women, the incidence of these complications has not been well-reported in Asian countries. Due to poor medical and midwifery care and little knowledge among populations exposed to the risk of gestational diabetes, the incidence of these complications seems to have increased in Asian countries compared with western countries (10).This disease has several effects on the mother and the fetus. The most common complications include fetal macrosomia, delivery damages, cesarean, polyhydramnios, preeclampsia and neonatal metabolic disorders (hypoglycemia, hyperglycemia, and hyperbilirubinemia), respiratory distress syndrome, and finally late complications such as the development of type 2 diabetes in the mother after delivery (11). The impact of a diagnosis of GDM may lead to increased stress in pregnancy due to the demands of adherence to a treatment regimen and maternal concern about adverse outcomes for the mother and baby. studies indicatesthat the experience of GDM appears to be associated with increased psychological distress in comparison to the experience of non-diabetic pregnant women. This may indicate the need for psychological screening in GDM and the provision of psychological support in some cases.Gestational hypertension and proteinuria are known as preeclampsia syndrome which occurs in 2-8% of pregnancies and is the direct cause of 10-15% of maternal mortalities in all countries with low, medium, and high incomes. Alongstanding hypothesis is that individuals who are prone to frequent, large increases in blood pressure (BP)

during psychological stress are at risk for developing essential hypertension. However, after many years of investigation, a clear understanding of the etiologic role of stress responses has not emerged. Exposure to competitive mental tasks significantly reduced the urinary sodium and fluid excreted by young women with one or two hypertensive parents or with borderline hypertension (12). In this high-risk group, the degree of retention was directly related to the magnitude of heart rate increase during stress, suggesting common mediation by way of the sympathetic nervous system. Thus, psychological stress appears to induce changes in renal excretory functions that may play a critical role in long-term blood pressure regulation.

Materials and Methods

The present study was conducted by searching both English and Persian databases including magiran, SID, Google scholars, and science direct pub med by using keywords such as stress, hypertention , gestational diabetes , pregnancy review. At first, the researcher searched a large number of studies. Then, from among the studies searched, those that were not related to the subject of the present study were removed, and the researcher used only those studies having a proper relationship with the present study. In the present study, it was attempted to investigate the effects of stress on HTN and DM during pregnancy.

Conclusion

As a result of the stimulation of the automatic nervous system, especially the sympathetic nervous system, stress causes a condition that weakens the internal and external controlling of the body and disturbs the normal functioning of the body and, finally, leads to anxiety in the person. Also, the serum level of placental IL-10 which plays an important role in normal pregnancy is reduced in women with preeclampsia. The levels of IL-6 and TNF-a proinflammatory cytokines are higher is women who experience more stress during pregnancy. Psychological stress during pregnancy is an important phenomenon which is unfortunately not measured in the common pregnancy healthcare

measures (13). As a result, its level during pregnancy and its effect on the mother's health is unknown. The persistence of the stressful factor destroys body resources and makes the person vulnerable against diseases and may cause physical disorders such as obesity, resistance to insulin, metabolic syndrome, gastrointestinal ulcers, hypertension, and cardiovascular diseases. Increased blood pressure is an important problem during pregnancy. Preeclampsia is related to preterm delivery, low weight of the baby at birth, intrauterine growth restriction, and fetus and infant mortalities. Measuring blood pressure is a common screening test in pre-delivery healthcare which is used to diagnose or predict the hypertension disease (14). In the second half of pregnancy, measuring mean arterial pressure is a better predictor for increased gestational hypertension than systolic blood pressure or systolic and diastolic blood pressure. Consuming omega 3 in late stages of pregnancy reduces thromboxane A2 production and increases prostacyclin 13 production by two to three times. Therefore, consuming omega 3 in late stages of pregnancy may be effective in preventing or treating preeclampsia. Food resources contain unsaturated fatty acids with long omega 3 chains. The reactions resulting from EPA and DHA molecular processes in the cell membrane reduce thromboxane A2. Reducing thromboxane A2 plays an important role in primary and secondary prevention of increased blood pressure and other cardiovascular diseases (15).

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