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Complications and treatment of gestational diabetes

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Abstract
Diabetes mellitus is one of the most common endocrine diseases that has a chronic progression and occurs when either the pancreas does not produce enough insulin or the body does not use the produced insulin efficiently. There are three man types of diabetes, including type 1 diabetes, type 2 diabetes, and gestational diabetes. Searches were conducted by two independent researchers in international (PubMed, Web of science, Scopus and Google scholar) and national (SID, Magiran) databases for related studies from the inception of the databases to September 2017 (without time limitation) in English and Persian languages. To ensure literature saturation, the reference lists of included studies or relevant reviews identified through the search were scanned. The specific search strategies were created by a Health Sciences Librarian with expertise in systematic review search using the MESH terms and free terms according to the PRESS standard. Pregnant women with postpartum diabetes should be monitored 6 days after the end of pregnancy (FBS or OGTT for diabetes), and if intravenous plasma glucose is less than 126 in fasting mode and 200, 2 hours after a meal, that specific individual is not diabetic; however, given the history of gestational diabetes, the individual is at risk, and if fasting blood glucose is higher than or equal to 126 in fasting mode and 200, 2 hours after a meal the individual is diabetic and necessary measures must be taken.

Keywords: complications, treatment, gestational diabetes

Introduction
Diabetes mellitus is one of the most common endocrine diseases that has a chronic progression and occurs when either the pancreas does not produce enough insulin or the body does not use the produced insulin efficiently [1]. There are three man types of diabetes, including type 1 diabetes, type 2 diabetes, and gestational diabetes [2]. Gestational diabetes is the most common metabolic disorder during pregnancy involving the intolerance of various types of carbohydrates with different degrees which develops or is diagnosed for the first time during pregnancy [3]. Due to physiological and hormone changes in the body (lactobenic-progesterone-estrogen and cortisol) during pregnancy, pregnant women become prone to diabetes through producing extra insulin to compensate for possible deficiencies [4-5].

Methods
Search strategy
Searches were conducted by two independent researchers in international (PubMed, Web of science, Scopus and Google scholar) and national (SID, Magiran) databases for related studies from the inception of the databases to September 2017 (without time limitation) in English and Persian languages. To ensure literature saturation, the reference lists of included studies or relevant reviews identified through the search were scanned. The specific search strategies were created by a Health Sciences Librarian with expertise in systematic review search using the MESH terms and free terms according to the PRESS standard. After the MEDLINE strategy was finalized, it was adapted to search in other databases. Accordingly, PROSPERO was searched for ongoing or recently related completed systematic reviews. The key words used in the search strategy were “Complications, treatment, gestational diabetes” and Iran which were combined with Boolean operators including AND, OR, and NOT.

Study selection
Results of the Literature review were exported to Endnote. Prior to the formal screening process, a calibration exercise was undertaken to pilot and refine the screening. Formal screening process of titles and abstracts were conducted by two researchers according to the eligibility criteria, and consensus method was used for solving controversies among the two researchers. The full text was obtained for all titles that met the inclusion criteria. Additional information was retrieved from the study authors in order to resolve queries regarding the eligibility criteria. The reasons for the exclusion criteria were recorded. Neither of the review authors was blinded to the journal titles, the study authors or institutions.

Discussion
Gestational diabetes patients are divided into two categories of symptomatic and asymptomatic. Main symptoms of gestational diabetes include edema, overeating, fatigue, weight loss, visual impairment, high blood pressure, obesity, edema, and itching, sweating, diabetes mellitus [6]. The symptomatic group experience unusual blood glucose and high percentage of glycosylated hemoglobin. With about 70%, the majority of diabetic patients are asymptomatic, and they experience 56-55 mg / dl blood glucose, which is typically about 20% lower than healthy individuals; in order to diagnose people with this type of diabetes and prevent further complications in both the mother and the fetus, it is quite essential to consider this possibility through screening test. In addition, these people are

at risk for diabetes, and the search for gestational diabetes provides for the possibility of taking preventive measures [7].

The risk factors for gestational diabetes include being aged higher than 30 years old, the history of diabetes in family members, more than three times of pregnancy [8], having the history of deliveries with babies more than or equal to 4 kg, high blood pressure and embryonic anomalies, [9] increased triglycerides [10], and high body mass index. The higher the number of factors listed, the greater the risk of developing the disease.

The effects of gestational diabetes mellitus are divided into maternal and fetal ones. Maternal complications include diabetic ketoacidosis, weight gain, early delivery and spontaneous abortions [11], increased risk of urinary tract and genital, cesarean, and preeclampsia [12]; fetal complications include weighing higher than or equal to 4 kg, premature birth defects, congenital anomalies, respiratory distress, the probability of developing diabetes in newborns, and congenital disorders [13]. In addition, there might be late eternal complications such as developing type 2 diabetes in 5 years postpartum in 18-50% of cases [14], and the probability of hypertension, dyslipidemia, and long-term cardiovascular disease [15].

During the process of screening for gestational diabetes, if the pregnant women is at risk (history of stillbirth, at least 2 times spontaneous abortion, birth of a baby> 4 kg, history of diabetes in family grade and obesity BMI> 30 kg / m2), a GCT test with 50 grams of glucose should be performed in non-fasting mode. If the results of a 1 hour intravenous glucose test are less than 130 mg / dl, the probability of gestational diabetes is eliminated; but, the same test should be repeated at 24-28 weeks of gestational age. But if it is higher than or equal to 130 mg / dl, a three hour OGTT with 100 grams of glucose should be performed and the results should be interpreted in the same as 24-28 weeks of gestational age test; if pregnant women are not at risk, the GCT test is performed with 50 g of glucose in the non-fasting state during the gestational weeks 24-28 and if, according to the results, intravenous plasma glucose is higher than or equal to 130 mg/dl one hour after Glucose consumption, then, the patient should be suspected and re-tested for 3 hours glucose tolerance with 100 g glucose in fasting conditions. The patient should consume 150-200 grams of carbohydrate per day, at least 3 days before the test and should keep himself in fasting condition from midnight before the day of the test (at least 8 hours), while not drinking water during this period [16].

The usual values for plasma glucose after taking 100 g of glucose (according to Coustan-Carpenter criteria) in pregnant women include

Fasting plasma glucose> 95 mg / dL
Glucose one hour after OGTT <180 mg / dl
Sugar two hours after OGTT <155 mg / dl
Sugar three hours after OGTT <14 mg / dl

If two blood samples are equal or greater than high, the glucose tolerance test is impaired and the individual is diagnosed with gestational diabetes, but if only one sample of the 4 samples is impaired, three hours OGTT with 100 g of glucose is repeated one month later at the weeks 32-36 of gestational age [17].

Treatment

1. **Medical Therapeutic Diet**: Nutrition advice is an important point in patient care and treatment; this form of treatment tries to provide the food needed for the mother and the baby, control the blood glucose level and prevent ketosis from food deprivation. The diet of diabetic pregnant women varies according to their weight and should not be too high in carbohydrates, because carbohydrates are the most important factor in increasing glucose levels after food. 2- The diets must include less breakfast and minimum carbohydrate. 3. The treatment diet should have a high frequency and a low amount in each meal in order to prevent increase in glucose after food and the hunger-induced obturation before food [18].
2. **Exercise:** It is recommended to have an appropriate exercise program in patients with gestational diabetes who do not have a medical and midwifery ban because an exercise program that improves cardiovascular performance helps blood glucose control. Suitable exercises either involve upper body muscles or the mechanical pressure is slightly applied to the trunk. In addition, several randomized trials show that exercising for 20 minutes 3 times a week can dramatically reduce the level of glucose in patients with gestational diabetes [19].
3. **Pharmacological:** Glucose-lowering oral medications are not recommended for the treatment of gestational diabetes, but only insulin is used and the onset of insulin therapy is when the diet is able to maintain plasma glucose levels below 105 mg/dl or plasma glucose less than one hour after a meal. 155 mg / dl or 2 hours after food is less than 130 mg / dl and 95 mg / dl in the fasting state and also when the plasma glucose level remains normal only in the event of hunger [20].

In order to treat hyperglycemia in different subjects, such as pregnant women with type 1 diabetes, four daily injections are recommended. Mother's blood glucose control is used to determine and treat severe hyperglycemia in order to prevent fetal harm. In addition, daily control of blood glucose by the individual is more effective than controlling plasma glucose intermittently; the number of times a person should check their blood glucose is different, and some believe it should be done at least 4 times a day (fasting and 1 to 2 hours after a meal); in addition, patients who observed symptoms of hypoglycemia and hyperglycaemia, should measure their blood glucose [21].

Pregnant women with postpartum diabetes should be monitored 6 days after the end of pregnancy (FBS or OGTT for diabetes), and if intravenous plasma glucose is less than 126 in fasting mode and 200, 2 hours after a meal, that specific individual is not diabetic; however, given the history of gestational diabetes, the individual is at risk, and if fasting blood glucose is higher than or equal to 126 in fasting mode and 200, 2 hours after a meal the individual is diabetic and necessary measures must be taken [22].

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