



## **Relationship between Blood Pressure and Diabetes in Pregnancy**

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### **Abstract**

**Introduction:** Pregnancy is a critical period in which maternal health plays a vital role in the health of the baby; so underlying conditions, illness and disorders caused during pregnancy or external factors can endanger the health of the mother, the fetus or both.

**Methods:** In this review article, the databases Medline, Cochrane, Science Direct, and Google Scholar were thoroughly searched to identify the studies Relationship between Blood Pressure and Diabetes in Pregnancy.

**Results:** Pregnancy is probably a vital period for proper health measures and interventions aiming to reduce the spreadout of type 2 diabetes. The prevalence of pregnancy diabetes varies from 1-14% during pregnancy, which depends on the region and population studied, the difference in data collection methods, non-random selection of the mothers and diagnostic criteria applied.

**Discussion and conclusion:** This competition, along with the reduction of beta cellular supply, sparks pregnancy diabetes. Thus, a stress test is applied to cause glucose intolerance and, in fact, genetic potentiality to diabetes type 2 is due to hormonal changes, which often occurs in the second half of pregnancy, in a way that insulin resistance increases progressively until delivery.

**Keywords:** Blood Pressure, Diabetes in Pregnancy

### **Introduction**

Pregnancy is a critical period in which maternal health plays a vital role in the health of the baby; so underlying conditions, illness and disorders caused during pregnancy or external factors can endanger the health of the mother, the fetus or both. (1). Some problems during pregnancy, such as the presence of pregnancy blood pressure, the incidence of childbirth bleeding, premature rupture of the embryo, early childbirth and inappropriate weight of the fetus, can lead to unpleasant outcomes (2). The outcome of pregnancy is heavily influenced by the health of the mother and her physical condition as well, and issues such as medical problems or maternal surgeries will

affect pregnancy outcomes. Pregnancy-related diabetes mellitus can be commonly cited in this period (4). Pregnancy is a common and prevalent medical condition in the field of carbohydrate intolerance which affects the phenomenon of pregnancy and can lead to undesirable outcomes and high-risk childbirth and affect the mother and the fetus (5). The adverse effects of motherhood include increased prevalence of hypertension and preeclampsia, increased cesarean section rate, Cardiovascular diseases and complications associated with dyslipidemia, abdominal obesity, hydramnios, pyelonephritis and long-term hospitalization (6). High blood pressure

(HBP) is one of the most critical health issues in industrialized countries. This common problem is asymptomatic and at the same time easily diagnosable which is usually curable, and often causes lethal complications in the absence of treatment. Based on conducted studies, around 33% of the patients are not diagnosed with the disease and only 50% of them are under treatment, and in total, only 30% of the patients control their blood pressure at the ideal level(7). The prevalence of the disease depends on both the racial segregation of the studied population and the criteria used to diagnose HBP.

## Methods

In this review article, the databases Medline, Cochrane, Science Direct, and Google Scholar were thoroughly searched to identify the studies Relationship between Blood Pressure and Diabetes in Pregnancy. In this review, the papers published until early January 2017 that were conducted to study the Relationship between Blood Pressure and Diabetes in Pregnancy were selected. In searching for the articles, those English papers were selected that had Relationship between Blood Pressure and Diabetes in Pregnancy.

## Results

In a study on the white suburban dwellers, about one-fifth of the people had blood pressure over 160/95 mmHg; while, the blood pressure of nearly half of them was higher than 140/90 mmHg. The prevalence of the problem in women is closely related to their age and increases significantly after 50 years of age (8). Despite progress in treating HBP, the etiology of this disease is vague in many points, so that in 90 to 95% of patients no diagnostic causes were discovered and the disease in these patients is called as the primary type. Secondary HBP refers to cases when a mutation or specific genetic defect has caused the disorder (9). Blood pressure in pregnancy can be divided into two major categories. First, a pre-pregnancy HBP which is more of the primary type and secondly, the blood pressure due to pregnancy. Pregnancy HBP (hypertension) occurs during pregnancy period which is itself divided into two groups of pregnancy hypertension and preeclampsia (10). Pregnancy-induced HBP in systolic pressure over 140 mmHg or diastolic pressure over 90 mm, and an increase in systolic blood pressure by at least 30 mmHg, or in diastolic pressure of at least 15 mmHg, was carried out by the American midwifery college and gynecologists who measured twice at an interval of at least 6 hours

after the 20th week of expectancy (11). The international society for HBP in pregnancy proposed a simpler definition in which two separate measurements at a 4-hour interval of diastolic blood pressure higher than 90 mmHg or a measurement higher than 140 mmHg, were considered as pregnancy HBP (12). This definition, in addition to simplicity, is more applicable since it does not need to know about the pre-pregnancy blood pressure and more meaningful prognosis has been proven for it. Pregnancy diabetes is defined as glucose intolerance which is first diagnosed during pregnancy (13). Pregnancy diabetes is an endocrine metabolic disease and occurs when pancreatic function in the pregnant mother is not sufficient to overcome pregnancy-induced diabetes, and is considered as pre-diabetic condition, which by playing a key role in the rapid rise of diabetes, is one of the prognostic factors of diabetes type 2 in the future of mothers and the expected children (14). In the next 30 years, it is expected to have a significant increase in the number of diabetic patients around the world to 366 million people, and prognostic measures should be taken and planned to prevent this global problem (15). Pregnancy is probably a vital period for proper health measures and interventions aiming to reduce the spread of type 2 diabetes. The prevalence of pregnancy diabetes varies from 1-14% during pregnancy, which depends on the region and population studied, the difference in data collection methods, non-random selection of the mothers and diagnostic criteria applied.

## Discussion and Conclusion

Generally, there are no accepted classifications and international criteria regarding pregnancy-related HBP, and therefore comparing the results of different studies is not easily possible due to the use of various criteria (16). Other diseases which are significant in pregnancy include pregnancy diabetes, which is the most common metabolic disorder in pregnancy (17). Pregnancy is a complex metabolic condition which includes significant changes in the hormonal environment, as well as changes in adipokines and inflammatory cytokines. Pregnancy is associated with a significant increase in estrogen level, progesterone, prolactin, cortisol, *human chorionic gonadotropin* (HCG), leptin, TNF- $\alpha$ , and oxidative stress indexes (18). The reduction of adiponectin from the second trimester increases insulin resistance in the mother to facilitate the placenta supplying fetus (19). Pregnancy diabetes is caused by disorder of at least three aspects of metabolism: Insulin resistance, insulin secretion and increased liver glucose production. Although the level

of insulin secretion increases in women with pregnancy diabetes, such as women with normal glucose tolerance; this compensation is not sufficient to overcome insulin resistance and maintain normal blood glucose levels (20). This competition, along with the reduction of beta cellular supply, sparks pregnancy diabetes. Thus, a stress test is applied to cause glucose intolerance and, in fact, genetic potentiality to diabetes type 2 is due to hormonal changes, which often occurs in the second half of pregnancy, in a way that insulin resistance increases progressively until delivery.

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	Subject: Medical Sciences
Quick Response Code	
DOI: <a href="https://doi.org/10.22192/ijarbs.2017.04.09.006">10.22192/ijarbs.2017.04.09.006</a>	

How to cite this article:

Khadije rezaie Keikhai , Sara Zamanpour, Morteza Salarzaei. (2017). Relationship between Blood Pressure and Diabetesin Pregnancy. Int. J. Adv. Res. Biol. Sci. 4(9): 44-47.

DOI: <http://dx.doi.org/10.22192/ijarbs.2017.04.09.006>