COMPARATIVE STUDY BETWEEN GESTATIONAL AND PREGESTATIONAL DIABETES IN RELATION TO GLYCEMIC CONTROL AS REGARDING FETAL AND NEONATAL OUTCOME

Thesis

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Abstract

Diabetes in pregnancy, either Gestational (GDM) or pre-gestational diabetes mellitus (PGDM), is linked to several maternal and fetal/neonatal complications. These include pregnancy-induced hypertension, preeclampsia, operative delivery, fetal macrosomia, neonatal asphyxia, birth trauma, respiratory distress, prematurity, and congenital defects.

In women with type 1 DM who are poorly controlled at the time of conception and during the early weeks of gestation, the incidence of spontaneous abortion and major congenital malformations are increased. These anomalies can be prevented by tight control of maternal glycemia before gestation and during the early weeks of pregnancy.

(Key Words)

(Gestational diabetes – Pregestational diabetes - Glycated hemoglobin)

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WHO= World Health Organization.

GDM = gestational diabetes mellitus.

GAD = glutamic acid decarboxylase.

ENDIT = European Nicotinamide Diabetes Intervention Trial.

OGTT = oral glucose tolerance test.

DPT-1 = Diabetes Prevention Trial–Type 1.

MODY = maturity-onset diabetes of the young.

IGT = impaired glucose tolerance.

IFG = impaired fasting glucose.

US = United States.

PCO = Polycystic ovarian syndrome.

HELLP = hemolysis, elevated liver enzymes, and low platelet count syndrome.

LGA = large for gestational age.

IOM's= Institute of Medicine's.

RDS= respiratory distress syndrome.

DKA= Diabetic ketoacidosis.

CVD= cardiovascular disease.

HbA1C= glycated hemoglobin.

MNT= Medical nutrition therapy.

BG= blood glucose.

BMI= body mass index.

LDL= low density lipoprotein.

HDL= high density lipoprotein.

NVD= Normal vaginal delivery.

CS= Cesarean section.

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Introduction

What is diabetes?

Diabetes mellitus is a metabolic disorder characterized by the presence of hyperglycemia due to defective insulin secretion, defective insulin action or both. The chronic hyperglycemia of diabetes is associated with significant long-term sequelae, particularly damage, dysfunction and failure of various organs – especially the kidneys, eyes, nerves, heart and blood vessels (**Ehud, 2008).**

Dysglycemia is a qualitative term used to describe blood glucose (BG) that is abnormal without defining a threshold. The adoption of this term reflects uncertainty about optimal BG ranges and the current understanding that cardiovascular (CV) risk and mortality risk exist in people with even slightly elevated BG levels (**Ehud, 2008).**

Approximately 150 million are affected worldwide. The World Health Organization (WHO) has predicted that between 1995 and 2025 there will be a 35% increase in the worldwide prevalence of diabetes. As 3-10% of all pregnancies are complicated by diabetes, 90% is gestational & 10% is preexisting **(Snapp and Donaldson, 2008).**

Diabetes mellitus is the most common metabolic disorder that occurs during pregnancy. It has two clinical patterns; either pregestational diabetes mellitus or gestational diabetes mellitus **(Cunningham et al., 2010).**

There are 3 main types of diabetes Mellitus:

Type 1 diabetes : results from body's failure to produce insulin.

Type 2 diabetes : results from insulin resistance .

Type 3 diabetes : (Gestational diabetes) : when pregnant women who have never had diabetes before have a high blood glucose levels during pregnancy ***(Michael , 2007).***

Type 2 diabetes mellitus accounts for 8% of cases of diabetes mellitus in pregnancy. From women with gestational diabetes, between 20% and 50% subsequently develop type 2 diabetes mellitus ***(Lawrence et al., 2008).***

A 2008 study completed in the U.S. found that more American women are entering pregnancy with preexisting diabetes. In Fact the rate of diabetes in expectant mothers has more than doubled in the past 6 years ***(Lawrence et al., 2008).***

Infants of mothers with preexisting diabetes experience double the risk of serious injury at birth, triple the likelihood of cesarean delivery, and quadruple the incidence of newborn intensive care unit admission ***(Michael, 2007).***

FACTORS INFLUENCING THE PREVALENCE OF DIABETES

1-Age

Populations worldwide continue to show a consistent increase in the prevalence of diabetes with increasing age, with values reaching a plateau or even declining slightly in the very old. For example, in USA, among the age groups of 70-74, 75-79, 80-84 and ≥ 85 years, the prevalence of diabetes was shown to be 20.0, 21.1, 20.2 and 17.3%, respectively ***(Colagiuri and Davies, 2009).***

2-Body Weight

The world wide prevalence of obesity has grown to alarming levels of at least 300 million people. A body mass index (BMI) of ≥ 30kg/m2 increases the absolute risk of type 2 diabetes by approximately two fold, but up to 20 fold, relative to a normal BMI ***(Mokdad et al., 2009).***

3-Family History

Individuals with a family history of type 2 diabetes are at an increased risk for the disease. The life time risk of developing type 2 diabetes is estimated at 40% if one parent has type 2 diabetes ***(Colagiuri and Davies, 2009).***

4- Pre-Existing Impaired Glucose Homeostasis

Both impaired glucose tolerance (IGT) and impaired fasting glucose (IFG) are important risk factors for the development of future diabetes, increasing the risk between 10 and 20 fold compared to those subjects with normal glucose tolerance ***(Magliano et al., 2008).***

5-Life Style

It is well documented that the prevalence of diabetes varies among different ethnic groups. It was significantly higher among Hispanics (33.4%) than among blacks (29.6%), Asians (24.3%) and whites (18.4%). Certain ethnic groups are particularly susceptible to develop diabetes when they move from traditional to urbanized sedentary life style. Higher prevalence rate of DM in urban rather than rural environments within the same country ***(Colagiuri and Davies, 2009).***

6-Other Factors Predispose To diabetes mellitus :

· Dyslipidemia : high (triglyceride, cholesterol, low density lipoprotein LDL) or low (high density lipoprotein HDL).

· Hypertension ≥ 140/90 mmHg in adults is associated with an approximate two fold increase in undiagnosed type 2 diabetes.

· Diabetes is common in people with cardiovascular and cerebrovascular disease ***(Colagiuri and Davies, 2009).***