بسم الله الرحمن الرحيم

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بقسم التوثيق الإلكتروني بمركز الشبكات وتكنولوجيا المعلومات دون أدنى مسئولية عن محتوى هذه الرسالة.

ملاحظات: لا يوجد

Impact of diabetes in pregnancy on Stage II Lactogenesis among postpartum diabetic women compared to non-diabetics

Thesis

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By

Manar Muhammad Mobarez Muhammad

MB. B. Ch. Ain-Shams University 2011

Supervisors

Prof. Dr. Mohamed Reda Halawa

Professor of Internal Medicine and Endocrinology,
Faculty of Medicine, Ain-Shams University

Prof. Dr. Yara Mohamed Eid

Professor of Internal Medicine and Endocrinology,
Faculty of Medicine, Ain-Shams University

Prof. Dr. Gihan Fouad Ahmad

Professor of Pediatrics,
National Nutrition Institute

Dr. Laila Mahmoud Ali Hendawy

Assistant Professor of Internal Medicine and Endocrinology,
Faculty of Medicine, Ain-Shams University

Faculty of Medicine
Ain-Shams University

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أثر مرض السكري على المرحلة الثانية من تكوين لبن الأم في الحوامل المصابة بالسكري مقارنة بغير المصابات به

رسالة

توطئة للحصول على درجة الماجيستير في أمراض الغدد الصماء والأيض

مقدمة من

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تحت إشراف

أ.د/ محمد رضا حلاوة

أستاذ الباطنة العامة والغدد الصماء والسكر

كلية الطب- جامعة عين شمس

أ.د/ يارا محمد عيد

أستاذ الباطنة العامة والغدد الصماء والسكر

كلية الطب- جامعة عين شمس

أ.د/ جيهان فؤاد أحمد

أستاذ طب الأطفال

المعهد القومي للتغذية

د/ ليلى محمود علي هنداوي

أستاذ مساعد الباطنة العامة والغدد الصماء والسكر

كلية الطب- جامعة عين شمس

كلية الطب

جامعة عين شمس

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Contents

List of Abbreviations

Abb.	Full term
AAP	American Academy of Pediatrics
ABM	Academy of Breastfeeding Medicine
ACOG	American College of Obstetricians and Gynecologists
ACTH	Adrenocorticotropic hormone
ADA	American Diabetes Association
BMI	Body Mass Index
CS	Cesarean Section
DM	Diabetes Mellitus
DOL II	Delayed onset of lactogenesis II
GA	Gestational Age
GDM	Gestational Diabetes Miletus
GnRH	gonadotropin-releasing hormone
hPGH	Human placental growth hormone
hPL	Human Placental Lactogen
HTN	Hypertension
IADPSG	The International Association of Diabetes and Pregnancy Study Groups
IDM	Infant of Diabetic Mothers
IR	Insulin Resistance
IRS-I	Insulin Receptor Substrate-I
MNT	Medical Nutritional Therapy
MODY	Maturity Onset Diabetes of the Young
MRI	Magnetic Resonance Imaging
OGTT	Oral Glucose Tolerance Test
PCOS	Poly Cystic Ovary Syndrome
T1DM	Type 1 Diabetes Miletus
T2DM	Type 2 Diabetes Miletus
WHO	World Health Organization

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INTRODUCTION

Lactogenesis is the process in which the breasts gain the ability to secrete milk. It takes place in 2 stages: secretory initiation (stage I lactogenesis) then secretory activation (stage II lactogenesis). Stage II is hormonal dependent and is stimulated shortly after delivery and is characterized by the copious milk production usually at 2:3 days postpartum. ***(Pillay & Davis, 2022)***

Stage I, which is the secretory initiation, takes place during the second half of pregnancy while the placenta supplies high levels of progesterone. In stage I, only small amounts of milk can be secreted by week 16 gestation. ***(de Bortoli & Amir, 2016; Pillay & Davis, 2022)***

Then comes Stage II Lactogenesis which is the secretory activation phase with copious milk production after delivery. It is a hormonal process which is stimulated by the rapid drop in progesterone after placental delivery. Usually, at days 2 or 3 postpartum, most women experience swelling of the breast along with copious milk production. ***(Parker et al., 2015; Pillay & Davis, 2022; Scott et al., 2007)***

Late onset of milk production has been seen in women who have had retained placental fragments and diabetes. With retained placental fragments, lactogenesis stage II could be inhibited by the continued secretion of

progesterone and would continue to be inhibited until removal of the remaining placental fragments. Diabetes needs further studies. ***(Pillay & Davis, 2022; Scott et al., 2007)***

Onset of Stage II lactogenesis is an important determinant of breastfeeding course as it has effect on lactation initiation, exclusivity, and continuation – the important components of breastfeeding process. Delayed Lactogenesis II is also becoming an alarmingly common problem with many risk factors, some of them are non-modifiable e. g. primiparity but others are potentially modifiable factors such as delivery mode, duration of labor, labor medications, use of breastmilk substitutes and/or pacifiers, and maternal pre-pregnancy obesity. ***(Nommsen-Rivers et al., 2010)***

Other important risk factors were found to be recent gestational diabetes and insulin treatment. And while all breastfeeding mother-infant dyads should be assessed at 72 to 96 hours after delivery, early breastfeeding support for women with diabetes with these risk factors may be called for to ensure successful lactation especially at the initiation phase. ***(Cordero et al., 2014; Soltani et al., 2008)***

Gestational diabetes mellitus (GDM) was found to be associated with a 44% risk of delayed lactogenesis II. Differences have also been noticed in breastfeeding initiation and continuation by maternal diabetes status in a

way reflecting differences in prenatal education, indicating the need for increased efforts specially among pregestational diabetic women. ***(Cordero et al., 2014; de Bortoli & Amir, 2016).***

Aim of the work

This study aims to compare diabetic and non-diabetic pregnant women regarding the onset of stage II lactogenesis at 72 hours postpartum and to associate the degree of diabetes control in antepartum period with the delay in stage II of lactogenesis.

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DIABETES AND PREGNANCY

Diabetes Definition and Presentation:

Diabetes mellitus is taken from the Greek word diabetes, meaning siphon: to pass through and the Latin word mellitus meaning sweet. The term "diabetes" was first used by Apollonius around 250 to 300 BC. Ancient Greek, Indian, and Egyptian civilizations discovered the sweet nature of urine in this condition, hence the word Diabetes Mellitus. Mering and Minkowski, in 1889, discovered the role of the pancreas in the pathogenesis of diabetes. ***(Sapra & Bhandari, 2022).***

Diabetes is a group of metabolic diseases characterized by hyperglycemia resulting from defects in insulin secretion, insulin action, or both. The chronic hyperglycemia of diabetes is associated with long-term damage, dysfunction, and failure of different organs, especially the eyes, kidneys, nerves, heart, and blood vessels. ***(American Diabetes Association, 2010)***

Classification of diabetes:

According to ADA guidelines, diabetes can be classified into the following general categories:

1) Type 1 diabetes (ß-cell destruction leading to insulin deficiency, including latent autoimmune diabetes of adulthood (LADA)

2) Type 2 diabetes (insulin resistance frequently with progressive loss of ß-cell insulin secretion) diagnosed before pregnancy or detected in the first trimester.

3) Gestational diabetes mellitus (diabetes diagnosed in the second or third trimester of pregnancy that was not clearly overt diabetes prior to gestation)

4) Specific types of diabetes due to other causes, e. g., monogenic diabetes syndromes (such as neonatal diabetes and maturity-onset diabetes of the young (MODY), diseases of pancreas e. g. cystic fibrosis, and drug-induced diabetes e. g glucocorticoid use, HIV/AIDS medications. ***(ADA Standards_of_Care_2020, n. d.)***

Diabetes in women:

In 2019, there were an estimated 223 million women (20-79 years) living with diabetes. by 2045, the number may be 343 million. 20 million or 16% of live births had some form of hyperglycemia in pregnancy, 84% of them were due to gestational diabetes. 1 in 6 births was affected by gestational diabetes. Most cases were in low- and middle-income countries, where access to maternal care is usually limited. All categories of diabetes can crosscut or first present in pregnancy. ***(International Diabetes Federation, n. d.)***