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Review

How to prevent type 2 diabetes in women with previous gestational diabetes? A systematic review of behavioural interventions

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ABSTRACT

Objectives: Women with previous gestational diabetes (GDM) have a seven times higher risk of developing type 2 diabetes (T2DM) than women without. We aimed to review the evidence of effective behavioural interventions seeking to prevent T2DM in this high-risk group.

Methods: A systematic review of RCTs in several databases in March 2016.

Results: No specific intervention or intervention components were found superior. The pooled effect on diabetes incidence (four trials) was estimated to: -5.02 per 100 (95% CI: -9.24 ; -0.80).

Conclusions: This study indicates that intervention is superior to no intervention in prevention of T2DM among women with previous GDM.

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1. Introduction

Gestational diabetes mellitus (GDM) is defined as “any degree of glucose intolerance with onset or first recognition during pregnancy” [1]. Worldwide, the reported prevalence of GDM varies from <1% to 28% [2]. These differences can be explained by factors like ethnicity, maternal age, genetics, BMI, health behaviour and screening procedure and diagnostic criteria including health care systems. In Denmark, the prevalence of GDM is around 2.3% [3]. Globally, the incidence of GDM is expected to increase as the prevalence of obesity increases. GDM usually disappears postpartum, but the women have a seven times higher risk of developing type 2 diabetes (T2DM) compared to women without previous GDM [4]. The risk of T2DM is associated with body mass index before pregnancy, advanced maternal age and family history of diabetes [5,6]. Additionally, the risk is associated with body weight, physical activity, and diet postpartum [7].

The Diabetes Prevention Program (DPP) showed that an intensive lifestyle intervention aiming at “achieving and maintaining a weight reduction of at least 7 percent of initial body weight through a healthy low-calorie, low-fat diet and to engage in physical activity of moderate intensity” [8], halved the risk of developing T2DM among women with previous GDM [9]. How to support the women and their families in healthy diet and physical activity behaviour in less intensive interventions in routine care is a challenging question, and a systematic overview of effective interventions is lacking. Studies have shown poor quality of diets and low levels of physical activity among women with previous GDM [10–13], and it has been suggested that it can be very challenging to take care of own health in the new role as a mother [14]. Therefore, the need for targeted interventions is urgent in order to prevent T2DM in this high-risk group. As the first step in the development of a postpartum health promoting intervention for women with GDM in their recent pregnancy, we aimed to systematically review the current evidence of effective interventions.

2. Methods

2.1. Study design

In this systematic literature review, we included studies which met the following inclusion criteria: randomised con-

trolled trials (RCT) implementing T2DM preventive health behaviours among women with previous GDM. The main outcome in this review was T2DM incidence however, risk factors for T2DM (biomarkers of insulin resistance, body weight, and body composition) were also included. We included all behavioural interventions. Interventions solely consisting of pharmacological treatment were excluded. Furthermore, the intervention should be implemented within the first two years of the postpartum period. This is in accordance with our selected possible time span for an intervention still relying on motivation incurred during the pregnancy, and the first years with a newborn. The trial was also included, if the intervention started during pregnancy and continued during the postpartum time period.

The study population was restricted to women with a GDM diagnosis in the last pregnancy. We did not make any restrictions regarding publication year, but language was limited to English or Danish. Finally, all studies should be published in a peer reviewed journal and be included in the below databases.

2.2. Literature search and synthesis of data

We searched for trials included in PubMed, COCHRANE library, CINAHL and EMBASE in March 2016. In the following, the search string for PubMed is presented: (((((((“Diabetes Mellitus, Type 2”[Mesh]) OR “Noninsulin-Dependent Diabetes Mellitus”) OR NIDDM) OR “type 2 diabetes”)) OR (((((((exercise) OR physical activity) OR “Motor Activity”[Mesh])) OR (“Weight Loss” OR “weight reduction” OR “weight change”)) OR “Weight Loss”[Mesh])) OR (((“Body Mass Index” OR “BMI”) OR “Body Mass Index”[Mesh])) OR (“Waist Circumference”) OR “Waist Circumference”[Mesh])) OR (“Diet”[Mesh]) OR “Diet”)) OR (((“Glucose Intolerance” OR “impaired glucose tolerance” OR “impaired fasting glucose” OR “IGT” OR “IFG”) OR “Glucose Intolerance”[Mesh])) OR (((“Insulin Resistance” OR “insulin sensitivity”) OR “Insulin Resistance”[Mesh])) OR (“ β cell function” OR “beta cell function”)) AND (“Diabetes, Gestational”[Mesh]) OR (“Pregnancy-Induced Diabetes”) OR “gestational diabetes”)) Filters: Clinical Trial. Hence, both medical subject headings (MeSH) and text word terms were used in order to identify all relevant studies. This search string was adapted to and performed in EMBASE, CINAHL, and COCHRANE library.

Fig. 1 illustrates the study selection process which followed the PRISMA guidelines [15]. Records were identified through the search in PubMed, EMBASE, CINAHL, and COCHRANE

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