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Original research

Effect of intensive counselling on physical activity in pregnant women at high risk for gestational diabetes mellitus. A clinical study in primary care☆

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ABSTRACT

Objective: The level of physical activity (PA) of pregnant women in Finland is unknown. Even more limited is our knowledge of PA of women at high risk for gestational diabetes mellitus (GDM).

Methods: The women ($n = 54$) were randomly assigned to a lifestyle intervention group ($n = 27$) including exercise advice by a physiotherapist six times during pregnancy or to a control group ($n = 27$) without additional exercise advice. Outcomes of the present study were required sample size, timing of counselling and change of PA. PA was retrospectively reported during 12 months before pregnancy and recorded one week monthly during pregnancy.

Results: Individualized counselling by a physiotherapist resulted in small changes of recreational PA (2.7 MET hours/week, $p = 0.056$) up to gestational week 25 compared with the similar decreasing tendency of PA in the control group. The women decreased recreational PA after week 30. Sample size of 550 women at high risk for GDM per group would be needed for a PA study.

Conclusions: The optimal time window for increasing PA must be earlier than in the last trimester of pregnancy. Sample size for a study to increase PA by 2.7 MET hours/week on pregnant women at high risk of GDM should be about 550 per group.

Abbreviations: BMI, body mass index; GDM, gestational diabetes mellitus; KIHD, Kuopio ischemic heart disease risk factor; MET, metabolic equivalent; OGTT, oral glucose tolerance test; PA, physical activity; SD, standard deviation.

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1. Introduction

Management of women with gestational diabetes mellitus (GDM) consists of dietary counselling, physical exercise, and for those women who fail to maintain glycemic goals, insulin therapy [1]. Tobias summarized in a meta-analysis that greater total physical activity before or during early pregnancy is significantly associated with lower risk of GDM [2]. According to another meta-analysis physical activity and dietary interventions appear to be successful in reducing gestational weight gain [3]. Recently, in a randomized university-hospital based Norwegian study of 855 women, the authors concluded that there was no evidence to prevent GDM or to improve insulin resistance in healthy pregnant women with normal weight offering women a 12-week standard exercise program during the second half of pregnancy [4].

Several studies have suggested a link between physical activity and a reduced risk of GDM, but so far the evidence on the feasibility of life-style counselling to increase physical activity in high-risk pregnant women at primary care facility is scarce. In a cluster-randomized trial of 399 Finnish women at high risk for GDM, the intervention was effective in controlling birth weight of the newborns, but failed to have an effect on maternal GDM. Additionally, a statistically nonsignificant tendency for lower decrease in at least moderate activity MET minutes by 26–28 week gestation was observed among the intervention group as compared to the usual care group [5].

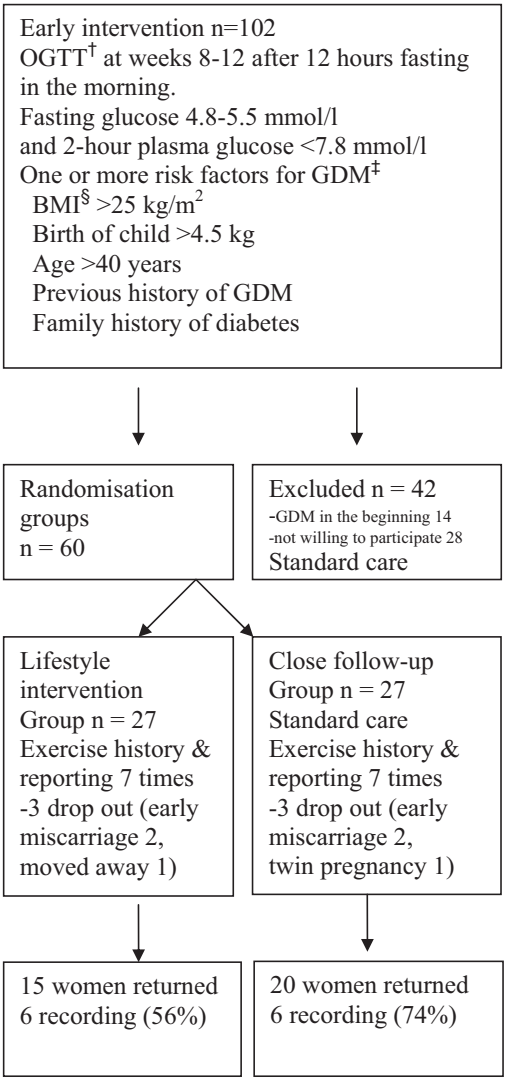
As part of a pilot study to prevent GDM we carried out a lifestyle intervention since early pregnancy (weeks 8–13) in women at a high risk for GDM. An intensive lifestyle advice did not offer additional benefits with respect to glucose tolerance. In the lifestyle intervention group three women had GDM in the second trimester and respectively one woman in the close follow-up group [6]. The lifestyle intervention resulted in somewhat lower weight gain during pregnancy (6.0 ± 3.6 kg up to weeks 26–28 and 11.4 ± 6.0 kg at the end of pregnancy in the intervention group and respectively 8.4 ± 3.6 kg and 13.9 ± 5.1 kg in the close follow-up group ($p = 0.062$) [7]. The mean birth weight was greater 3871 ± 567 g in the intervention group ($p = 0.047$, adjusted by the prepregnancy weight of women) compared with the close follow-up group 3491 ± 573 g. There was no difference in macrosomia between the groups [6]. Individualized counselling by a clinical nutritionist six times during pregnancy as part of a lifestyle intervention improved the quality of dietary fat intake in pregnant women at a high risk for GDM. PUFA intake increased ($p = 0.008$) in the intervention group compared with the close follow-up group. There were no clear differences in the changes of saturated fat, total energy and fibre intake between the groups. One woman smoked but stopped smoking in the beginning of pregnancy in the intervention group. Two women in the close follow-up group smoked during pregnancy. They stopped smoking in the second trimester [7].

In the current study we evaluated the effect of an intensive counselling on the change of physical activity as a part of life-style modification in women at a high risk for GDM. We compared that to a single session lifestyle advice combined with a close follow-up in primary health care. The goals were to give answers to the questions: required sample size, timing of counselling and the change of physical activity during pregnancy.

2. Methods

2.1. Study design

We carried out an open randomized controlled trial comparing a lifestyle intervention group with a close follow-up group of women at high risk for GDM as described elsewhere (Fig. 1) [6]. The recruitment started in April 2005 and ended in May 2006 in two Finnish rural municipalities Kauhajoki and Lapua. The study was carried out in accordance with the Helsinki declaration. The protocol was approved by the ethics committee of South Ostrobothnia Hospital District in



†Oral glucose tolerance test, ‡Gestational diabetes mellitus (fasting plasma glucose ≥5.6 mmol/l or 2-hour plasma glucose ≥7.8 mmol/l), §Body mass index

Fig. 1 – Flowchart of the selection procedure.