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Physical activity and psychological well-being in obese pregnant and postpartum women attending a weight-gain restriction programme

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ABSTRACT

Objective: the objective of the study was to compare the differences in psychological well-being and quality of life during pregnancy and post partum of obese physically active women and obese physically inactive women enroled in a weight gain restriction programme. We also wanted to explore whether physical activity influences weight change or health status during pregnancy.
Design: a prospective intervention study.
Setting: antenatal care clinic.
Participants: a total of 74 obese pregnant women in a physically active group and 79 obese women in a physically inactive group.
Measurements: the women kept diaries of their physical activity during pregnancy and answered the Beck Anxiety Inventory, the Edinburgh Postnatal Depression Scale and Medical Study Short-Form Health Survey in gestational weeks 15 and 35 and 11 weeks post partum. Physical activity was measured in metabolic equivalents.
Findings: the physically active women experienced fewer depressive symptoms and estimated an improved quality of life during their pregnancies as measured by physical functioning, bodily pain, social functioning, role limitations due to emotional problems and general mental health as compared with the physically inactive women. There were no differences between the groups in gestational weight gain or weight change from early pregnancy to post partum or in prevalence of complications.
Key conclusions: physical activity among obese pregnant women provides better psychological well-being and improved quality of life, but does not prevent weight change.
Implications for practice: staff at Antenatal Care Clinics that face obese pregnant women, should encourage and emphasise the benefits of being physically active throughout pregnancy.

Introduction

Regular physical exercise is associated with better physical and mental health (Swedish National Institute of Public Health, 2010). In Sweden, as well as in the US, the general recommendation for adults, including pregnant women, for physical activity is at least 30 minutes of moderate intensity on most days of the week (Pate et al., 1995; Bell, 2006; Swedish National Institute of Public Health, 2010). Two Norwegian studies investigated the level of physical activity among pregnant women and reported levels of activity for regular exercisers of 81%, 69% and 11% before pregnancy, in the first and in the third trimester respectively, whereas a British study found that 65% of women in gestational week 13 achieved at least 30 minutes moderate or vigorous daily activity (Haakstad et al., 2007; Haakstad et al., 2009; McParlin et al., 2010).

Some recent studies have investigated physical activity during pregnancy and the first year post partum and report an association between physical activity and a lower risk of hypertensive complications, fewer symptoms of nausea, vomiting and low back pain (Martin and Brunner Huber, 2010; Foxcroft et al., 2011). Furthermore, physical activity during pregnancy was associated with an improved health-related quality of life, lower post-partum Body Mass Index (BMI) and fewer depressive symptoms (Montoya Arizabaleta et al., 2010; Vernon et al., 2010). In a current meta-analysis by Streuling et al. (2010) with randomised controlled trials on healthy pregnant women, with increased physical activity as the only intervention, the authors conclude that physical exercise during pregnancy might be successful in restricting gestational weight gain (Streuling et al., 2010).

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In many intervention studies with the aim of preventing excessive gestational weight gain, recommendations or advisories concerning physical activity and exercise were given (Polley et al., 2002; Olson et al., 2004; Artal et al., 2007; Kinnunen et al., 2007; Asbee et al., 2009; Guelinckx et al., 2010; Phelan et al., 2011). Only a few of these studies have reported outcomes (Polley et al., 2002; Kinnunen et al., 2007; Guelinckx et al., 2010). Polley et al. (2002) and Kinnunen et al. (2007) found no difference in exercise level between the intervention group and the control group, whereas in the study of Guelinckx et al. (2010) physical activity decreased during pregnancy in both the two intervention groups and in the control group.

We have previously shown, in an intervention study among obese pregnant women, that structured motivational and behavioural treatment strategies during pregnancy were effective in minimising the gestational weight gain to less than 7 kg (Claesson et al., 2008) and at follow-up two years after childbirth, that the subgroup of women in the intervention group who gained < 7 kg during pregnancy, had a lower weight than corresponding women in the control group (Claesson et al., 2010).

Whether regular physical exercise together with a weight gain restriction intervention programme has an additive effect on psychological well-being or in preventing weight gain has been little investigated.

The primary aim of our study was to compare two groups of obese pregnant women participating in a weight gain restriction programme, one whose members exercised regularly during pregnancy, the other whose members did not. The comparisons concerned differences in psychological well-being and quality of life during pregnancy and post partum. The secondary aim was to explore whether physical activity influenced weight change from early pregnancy to post partum or health status during pregnancy.

Methods

Sweden has a very well-attended maternal health-care system, which reaches almost 100% of pregnant women and is free of charge. The expectant mothers receive care at Antenatal Care clinics and normally make seven to nine visits with a midwife and, if needed, additional visits with an obstetrician.

Subjects

During November 2003–December 2005 all obese (BMI ≥ 30 kg/m^2, $n=317$) pregnant women who registered at the Antenatal Care clinic in the city of Linköping and surroundings were offered the chance to participate in an intervention study with the aim of minimising gestational weight gain to less than 7 kg. The exclusion criteria were inability to understand Swedish, a diagnosis of pre-pregnant diabetes, thyroid dysfunction or a psychiatric disease treated with neuroleptic drugs, and 45 women were therefore excluded from participation. Twenty women moved out of the area during pregnancy, and 13 had early spontaneous or legal abortion and were also excluded. Of the 230 remaining women, 70 women chose not to participate and five dropped out during pregnancy. Finally, 155 women (67.4%) completed the study. For more information about the study, see Claesson et al. (2008).

All women were instructed to keep a diary of their physical exercise during the whole pregnancy. They were also instructed to register every activity that entailed activity with the intensity of a brisk walk or greater, and they were encouraged to perform such activities at least 30 minutes a day. In this study we defined physical activity as being habitual when performed with at least moderate intensity three times weekly or more during at least 15 weeks of pregnancy. Out of the 155 women, 74 women with singleton pregnancies reported making physical activity a habit during pregnancy, and these 74 constituted the physically active (PA) group. The remaining 79 women with singleton pregnancies got the same recommendations concerning physical activity during pregnancy, but chose, according to their diaries, to exercise below the recommended amount regarding intensity, frequency or duration. Thus, these 79 constituted the physically inactive (PIA) group.

Measures

The intensity of physical activity was measured by using the entity of metabolic equivalents as a wide range of activities have been reported (Ainsworth et al., 2000). Metabolic equivalents make possible a structured classification system for coding physical activity by type and intensity. An activity with energy expenditure of three metabolic equivalents or more was considered as moderate intensity and corresponds to a brisk walk (Pate et al., 1995).

Symptoms of depression and anxiety were measured with Edinburgh Postnatal Depression Scale (EPDS) and Beck Anxiety Inventory (BAI) and quality of life was measured with Medical Outcome Study Short-Form Health Survey (SF-36 [version 1]) at three times during and after pregnancy, in gestational weeks 15 and 35 and finally 11 weeks post partum.

EPDS is a 10-item self-report scale assessing symptoms of depression such as dysphoric mood, anxiety, and feeling of guilt, suicidal ideas and 'not coping'. Each item is scored on a four point scale (0–3) and rates the intensity of depressive symptoms during the previous seven days. The higher the score, the greater the number of depressive symptoms. The scale is specifically designed to screen for postpartum depression but can also be used as a valid measure of dysphoria through the various stages of pregnancy and the puerperium (Cox et al., 1987). The validity of the Swedish version has been tested (Rubertsson et al., 2011).

BAI was used to measure the severity of anxiety (Beck et al., 1988). The BAI consists of a 21-item self-report inventory where each item describes a common symptom of anxiety. The BAI discriminate anxiety from depression (Beck et al., 1988). The respondent was asked to rate each symptom over the preceding week on a four point scale (0–3). Scores of 0–7 reflect minimal anxiety, 8–15 mild anxiety, 16–25 moderate anxiety and score of 26–63 indicate severe anxiety (Beck and Steer, 2005). The BAI is investigated and validated in non-clinical-samples (Nordhagen, 2001).

SF-36 groups 36 items into eight health concepts which assesses: Limitations in physical activities because of health problems, limitations in social activities because of physical or emotional problems, limitations in normal role activities because of physical health problems, bodily pain, general mental health (psychological distress and well-being), limitations in ordinary role activities because of emotional problems, vitality (energy and fatigue) and general health problems (Ware and Sherbourne, 1992). An additional single item concerns reported health transitions during the preceding year. Physical and mental components summaries are calculated separately. The form is designed for use in clinical practice and research and a high score represents a better health-related quality of life. It has been translated into Swedish and shows good construct validity and high reliability across general populations in Sweden (Sullivan et al., 1995).

Statistics

All analyses were performed using the IBM SPSS programme, version 19.0 (IBM Corporation, Armonk, NY, USA). Statistical significance was defined as (two-sided) $p \leq 0.05$. Group differences were estimated using the χ^2 test on categorical variables and Student's t-test on continuous, normally distributed