

# Exercise training & weight gain in obese pregnant women

## Mini review

Physical activity during pregnancy can increase cardiorespiratory fitness, decrease gestational weight gain and lowers the risk of preeclampsia. However, such benefits remain uncertain in obese pregnant women. The obese women are less active than their lean counterparts, which increases their already low fitness levels and risk of excessive gestational weight gain. Consequently, exercise programs targeting this population are needed. Such exercise programmes can decrease the risk of perinatal complications.<sup>1</sup> Now-a-days, the pre-pregnancy obesity and excessive maternal gestational weight gain are increasing in prevalence and is associated with a number of adverse perinatal outcomes. Maternal obesity causes a number of adverse outcomes both during and after pregnancy, such as gestational diabetes, preeclampsia, caesarean delivery and large for gestational age fetus. The maternal obesity is also a risk factor for childhood obesity among the babies.<sup>2</sup> Besides, an over 60% of overweight women gain more weight than recommended during pregnancy. The gestational weight gain is directly associated with maternal weight retained after delivery as well as with childhood obesity and obesity in early adulthood among off-spring. The excess gestational weight gain among mothers may accelerate the obesity epidemic. It has been proposed that pregnancy is a unique period of time with regard to changing women's behaviour.<sup>3</sup>

In general, women are not active enough during pregnancy and women who have a high pre-pregnancy BMI are even less likely to be physically active. So the prevention of weight gain in overweight and obese pregnant women can be an important public health issue. Current recommendations say that pregnant women should exercise with moderate intensity for 30 minutes or more on most, if not all, days of the week.<sup>4</sup> A study was done by Michèle Bisson, Natalie Alméras, Sébastien S. Dufresne et al.<sup>5</sup> to evaluate the effect of a 12-week exercise program and an active lifestyle throughout pregnancy in pregnant women with obesity. In this randomised trial, pregnant women (body mass index 30 kg/m<sup>2</sup> or more) were allocated to either standard care or supervised exercise training, from 15 to 27 weeks of gestation. Their physical activity was measured at 14, 28 and 36 weeks, while fitness, nutrition (caloric intake and macronutrients percentage) and anthropometry were assessed at 14 and 28 weeks of gestation. Analyses were performed using repeated measures. A total of fifty (50) women were randomised, 25 in each group. Exercisers gained less weight than controls during the intervention period despite similar nutritional intakes (difference in weight change = -0.1 kg/week, 95% CI -0.2; -0.02,  $p = 0.016$ ) and improved cardiorespiratory fitness (difference in fitness change = 8.1%, 95% CI 0.7; 9.5,  $p = 0.041$ ).<sup>5</sup>

Another study was by Chen Wang et al was to test the efficacy of regular exercise in early pregnancy to prevent gestational diabetes mellitus in Chinese overweight/ obese pregnant women. In this prospective randomized clinical trial non smoking women age >18 years with a singleton pregnancy who met the criteria for overweight/obese status (body mass index  $24 \leq 28$  kg/m<sup>2</sup>) and had an uncomplicated pregnancy at <12+6 weeks of gestation were randomly allocated to either exercise or a control group. These women did

Volume 7 Issue 2 - 2018

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**Received:** March 06, 2018 | **Published:** April 05, 2018

not have contraindications to physical activity. Patients allocated to the exercise group were assigned to exercise 3 times per week (at least 30 min/session) via a cycling program begun within 3 days of randomization until 37 weeks of gestation. Those in the control group continued their usual daily activities. Both groups received standard antenatal care, without special dietary recommendations. The primary outcome was noted as incidence of gestational diabetes mellitus among the study group. About 300 singleton women at 10 weeks' gestational age and with a mean pre-pregnancy body mass index of  $26.78 \pm 2.75$  kg/m<sup>2</sup> were recruited. They were randomized into an exercise group (n=150) or a control group (n=150). In all, 39 (26.0%) and 38 (25.3%) participants were obese in each group, respectively.

Women randomized to the exercise group had a significantly lower incidence of gestational diabetes mellitus (22.0% vs 40.6%;  $P < .001$ ). These women also had significantly less gestational weight gain by 25 gestational weeks ( $P < .001$ ) and at the end of pregnancy ( $P < .001$ ), and reduced insulin resistance levels at 25 gestational weeks. Other secondary outcomes, including gestational weight gain between 25-36 gestational insulin resistance levels at 36 gestational weeks, hypertensive disorders of pregnancy, cesarean delivery (except for scar uterus), mean gestational age at birth preterm birth, macrosomia (defined as birth weight >4000 g), and large-for-gestational-age infants were also lower in the exercise group compared to the control group. However, infants born to women following the exercise intervention had a significantly lower birth weight compared with those born to women allocated to the control group.<sup>6</sup> Study done by Kirsti et al was done to see the effectiveness of exercise training for preventing excessive gestational weight and gestational Diabetes Mellitus. They concluded that regular exercise training in pregnancy could not reduce GWG in women with pre-pregnancy overweight/obesity. The incidence of GDM and systolic blood pressure were lower in patients assigned to the exercise group.<sup>7</sup>

## Conclusion

Compared with standard care, a supervised exercise program allows pregnant women with obesity to maintain fitness limit weight gain and attenuate the decrease in physical activity levels observed

in late pregnancy. The cycling exercise initiated early in pregnancy and performed at least 30 minutes, 3 times per week, is associated with a significant reduction in the frequency of gestational diabetes mellitus in overweight/obese pregnant women. The exercise started at the beginning of pregnancy decreases the gestational weight gain before the mid-second trimester. Furthermore, there was no evidence that the exercise prescribed increased the risk of preterm birth or reduced the mean gestational age at birth. There was variable reduction in gestational weight gain among overweight/obese women who received a supervised exercise training program during their pregnancy. The incidence of GDM in late pregnancy seemed to be lower in the women randomized to exercise training than in the women receiving standard maternity care only. Systolic blood pressure in late pregnancy was also apparently lower in the exercise group than in the control group. These results indicate that supervised exercise training might be beneficial as a part of standard pregnancy care for overweight/obese women. In addition to effects on weight gain, there is a reduction in other pregnancy complications. There is an ability of regular exercise training to prevent gestational diabetes mellitus, as well as the effect on serum biomarkers associated with insulin resistance and inflammation. The exercise training may reduce lumbo-pelvic pain. Hence, regulated weight gain and careful exercise training can go a long way in providing health benefits to an obese pregnant woman. Current recommendations say that pregnant women should exercise with moderate intensity for 30 minutes or more on most, if not all, days of the week. The various observational studies regarding physical activity in pregnancy have found reduced weight gain in active mothers as well as reduced risk of adverse pregnancy outcomes.

## Acknowledgement

None.

## Conflict of interest

None.

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