Physical activity, sitting time, and duration of sleep during pregnancy in association with pregnancy outcomes

Li-Yin Chien, RN, ScD¹; Tzu-Ling Chen, RN, MS²; Chen-Wei Tai, MD, PhD³⁴

¹Professor, Institute of Community Health Care, National Yang-Ming University, ²PhD student, Dept. of Nursing, National Yang-Ming University, ³Professor, Dept. of Medicine, Taipei Medical University, ⁴Director, Dept. of Traditional Chinese Medicine, Taipei Medical University Hospital

Abstract

Purpose: Previous studies correlating physical activity and sedentary behavior during pregnancy to adverse pregnancy outcomes yielded inconsistent results. The objectives of the current study were to examine physical activity, sitting time, and duration of sleep during pregnancy and explore their associations with cesarean delivery, complications during birth process, and low birthweight (<2500 g).

Methods: This cohort study recruited 803 pregnant women at six hospitals in northern Taiwan during their second trimester of pregnancy (14-27 weeks). The study participants were followed at third-trimester (28-40 weeks; n=623) and one month postpartum (n=574). Physical activity was measured by International Physical Activity Questionnaire short form. Sitting time and duration of sleep were enquired by structured questions. Data analyses were performed using t-tests and chi-squared statistics.

Results: Many women sit for more than 7 hours per day (47.9% before pregnancy, 65.8% at second trimester, and 50.8% at third trimester). Women who had achieved recommended physical activity level (150 minutes of moderate physical activity/walking or 75 minutes of vigorous physical activity a week) were 67.9% before pregnancy, 56.5% at second-trimester, and 53.6% at third-trimester, mostly through walking. The percentage of women who did vigorous or moderate physical activity besides walking decreased significantly throughout pregnancy (vigorous: 35.5% at prepregnancy, 10.6% at second trimester, 8.3% at third trimester; moderate: 47.8% at prepregnancy, 32.6% at second trimester, 28.0% at third trimester). Duration of sleep was significantly longer in the second (mean=8.16, SD=1.08) and third trimester (mean=8.12, SD=1.12) than before pregnancy (mean=7.9, SD=1.09). Women who had cesarean delivery, low birth weight, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Conclusion: Many women had a sedentary lifestyle before and during pregnancy. Women who had vigorous or moderate physical activities before pregnancy tend to stop their physical activities and changed to lower level physical activity, such as walking. Walking is the most popular form of physical activity among pregnant women in Taiwan, however, the intensity of walking may not be enough to yield health benefits. Women who had adverse pregnancy outcomes tend to have lower vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration. The sedentary lifestyle of women before and during pregnancy could increase the risk of obesity and chronic diseases. Programs target on promotion of physical activity and decreasing sitting time among pregnant women could be developed. Nurses could suggest that pregnant women who exercise maintain their pre-pregnancy physical activity, given activities requiring physical contact or causing falls are avoided.

Keywords: physical activity, pregnancy and sedentary behavior

Acknowledgement

This study is funded by the Ministry of Science and Technology, Taiwan (MOST104-2314-B-010-029-MY3).

Introduction

Physical activity guidelines recommends that pregnant women participate in at least 150 minutes of moderate intensity aerobic activity per week and pregnant women who habitually perform vigorous physical activity can continue during pregnancy. However, many pregnant women decreased their physical activity and increased sitting time during their pregnancy.

Generally, mother are advised to have 8 hours of bed time during pregnancy to assure adequate sleep. Sleep disturbance is common during pregnancy.

Methods

Design: This cohort study recruited 803 pregnant women at six hospitals in northern Taiwan during their second trimester of pregnancy (14-27 weeks). The study participants were followed at third-trimester (28-40 weeks; n=623) and one month postpartum (n=574).

Measurement: Physical activity was measured by International Physical Activity Questionnaire short form. Sitting time and duration of sleep were enquired by structured questions. Pregnancy outcomes were obtained at one month postpartum.

Data analysis: Data analyses were performed using t-tests and chi-squared statistics.

Results: Mean age of the study women was 32.95 (SD=4.34) years. More than half of the mothers (54.9%) were primiparous. Majority of mothers were employed full-time (65.0%) and had an educational level of university or above (72.3%). The rate for cesarean delivery, complications during birth process, and low birthweight (<2500 grams) was 31.7%, 27.1%, and 6.6%, respectively.

Women who met the recommended physical activity level decreased from prepregnancy to second trimester, and go up in the third trimester. They slept more and sit more during pregnancy than prepregnancy (Figure 1).

The percentage of women who did vigorous or moderate physical activity besides walking decreased significantly throughout pregnancy (vigorous: 35.5% at prepregnancy, 10.6% at second trimester, 8.3% at third trimester; moderate: 47.8% at prepregnancy, 32.6% at second trimester, 28.0% at third trimester).

Conclusions:

Many women had a sedentary lifestyle before and during pregnancy. Women who had vigorous or moderate physical activities before pregnancy tend to stop their physical activities and changed to lower level physical activity, such as walking. Walking is the most popular form of physical activity among pregnant women in Taiwan, however, the intensity of walking may not be enough to yield health benefits.

Women who had adverse pregnancy outcomes had lower vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes, though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.

Women who had cesarean delivery, low birth weight infant, or birth complications seem to have lower mean vigorous and moderate physical activity, shorter sitting time, and shorter sleep duration than women who did not have those pregnancy outcomes; though only a few comparisons reached statistical significance.