Taiwanese Journal of Obstetrics & Gynecology 57 (2018) 18–22

Contents lists available at ScienceDirect

Taiwanese Journal of Obstetrics & Gynecology

journal homepage: www.tjog-online.com

Original Article

Physical activities (exercises or choreses) during pregnancy and mode of delivery in nulliparous women: A prospective cohort study

Abdolhalim Rajabi [a, b], Najmeh Maharlouei [c], Abbas Rezaianzadeh [d], Kamran B. Lankarani [c], Firooz Esmaeilzadeh [e], Ali Gholami [f], Kamyar Mansori [g, h, *]

[a] Department of Community Medicine, School of Medicine, Golestan University of Medical Sciences, Gorgan, Iran
[b] Department of Epidemiology, School of Health, Iran University of Medical Sciences, Tehran, Iran
[c] Health Policy Research Center, Shiraz University of Medical Sciences, Shiraz, Iran
[d] Research Center for Health Sciences, Epidemiology Department, Shiraz University of Medical Sciences, Shiraz, Iran
[e] Department of Public Health, School of Nursing and Midwifery, Maragheh University of Medical Sciences, Maragheh, Iran
[f] Department of Epidemiology, School of Health, Iran University of Medical Sciences, Tehran, Iran
[g] Social Development & Health Promotion Research Center, Gonabad University of Medical Sciences, Gonabad, Iran
[h] Department of Epidemiology, School of Public Health, Iran University of Medical Sciences, Tehran, Iran

ARTICLE INFO

Article history:
Accepted 3 August 2017

Keywords:
Physical activity
Caesarean section
Pregnancy
Cohort study
Iran

ABSTRACT

Objective: The aim of this study was to investigate changes in physical activities during pregnancy and the relationship between physical activity and unplanned caesarean sections (CSs).
Materials and methods: A cohort study design was carried out. A cohort of 2029 pregnant women was established when they received prenatal care at 18–22 weeks of gestation in a medical center in southwest Iran. Participants were asked to recall their levels of physical activity during pre-pregnancy. The data were processed using Statistics/Data Analysis. To compare activities the chi-square was used to identify significant differences between the groups. A multiple logistic regressian was used to identify the association between activities and delivery mode as well as controlling potential confounding variables. In the analyses, the level of significance was set at $P < 0.05$.
Results: In total, 2029 pregnant women participated in the study, among which 1334 (65.84%) underwent CSs and 692 (34.16%) underwent NVDs. The study indicated the odds ratio of CS was 0.68 (95% CI: 0.47–0.97) for a pregnant woman who increased her level of activity during pregnancy compared to pre-pregnancy.
Conclusion: The results of this study showed that regular and standard physical activities during pregnancy can reduce the risk of caesarean section in pregnant women. These findings can be important in convincing health care providers to prescribe regular and standard physical activities for pregnant women during pregnancy.

Introduction

Pregnancy is a unique and special experience and its appropriate management promotes the physical and mental health of pregnant women. There are few events in life that may have such considerable physical, emotional and social effects on lives of the woman and her family [1]. During pregnancy, physical and mental aspects of women undergo a series of changes in both visible and invisible ways. Lack of a correct understanding may have unpleasant side impacts on physical and mental health. For instance, one of the common misbeliefs regarding pregnancy is that physical activities and performing exercise during pregnancy are problematic and that rest is the best option. Even in developed societies until 1985, recommending pregnant women to have rest was common among health care providers [2]. Unlike this erroneous belief, it should be noted that if scientific principles regarding exercise prescription be respected, performing exercise during pregnancy will be very valuable. The purpose of doing exercise during pregnancy is to maintain and promote physical fitness not increasing athletic abilities [3].

* Corresponding author. Social Development & Health Promotion Research Center, Gonabad University of Medical Sciences, Gonabad, Iran.
E-mail address: kamyarmansori@yahoo.com (K. Mansori).

https://doi.org/10.1016/j.tjog.2017.12.003

Physical fitness allows the pregnant woman to carry out the variety of daily activities with more vitality; as a result, the risk of diseases caused by physical inactivity are reduced [4]. Recently, according to the recommendations of the American College of Obstetricians and Gynecologists (ACOG), a large number of women have embarked on conducting exercise during pregnancy [5]. Evidence has shown that exercise has beneficial effects, even on those pregnant women who were sedentary before pregnancy [6]. Exercise is one of the best ways to reduce the adverse effects of pregnancy. It, in labor and delivery process, reduces pain and intensity and meanwhile improves heart and lung functions [7–10]. Also, through post-delivery exercise, the person returns more quickly to her pre-pregnancy shape, increasing her capabilities regarding the activities related to neonatal care [11].

There are many complications with pregnancy, one of the most important of which is cesarean section. Caesarean section is a major surgery that involves incising abdominal skin, the muscles under it and uterine lining. A Caesarean section is often performed when virginal delivery would put the baby's or mother's life or health at risk [12]. Given that cesarean section has always been one of the complications of pregnancy, medical experts trying with their utmost efforts to reduce the incidence of C-sections; however, the trend of this complication is so on the rise that in 2012 about 23 million C-sections were carried out globally [13,14]. In Iran, according to official statistics, the rate of cesarean is estimated to be about 35 percent; that is, three times as many as the global rate [15]. In some Iranian hospitals, this figure has reached up to 80 percent. According to unofficial statistics, Iran is the record holder of caesarean section in the world. Based on the abovementioned statistics, 75 percent of cesarean sections in Iran were not necessary [15].

The high rate of the caesarean section in the country may be due to cultural, economic, professional and physical factors. In the cultural dimension, the problem roots in the misbeliefs that are in favor of cesarean section (such as considering it to be a modern or scientific method that reduces complications for both mothers and infants) and against vaginal delivery. Financially, the hospitals and specialists are the main beneficiaries of performing cesarean. When it comes to professional factors resulting in high rate of cesarean, lack of attention to training and preparing pregnant women and low quality of services for carrying out natural delivery are of the main importance. Finally, regarding the physical factors of the large number of cesarean sections in Iran, lack of proper education and practice in terms of diet, nutrition and exercise makes mothers feel they do not have the stamina for vaginal delivery [17]. Probably doing exercise during pregnancy is an optimal intervention for promoting the physical and mental health of women both across and after pregnancy [18]. However, the effect of physical activity during pregnancy on the type of delivery is still controversial and published studies on physical activity during pregnancy are insufficient.

Therefore, considering the abovementioned issues and the uncertainty there is about the effects of physical activity on the mode of delivery and the vaginal delivery priority in health care and also given that no study has been done in this area in Iran, this study was designed and conducted to investigate changes in physical activity during pregnancy compared to pre-pregnancy and their effects on the mode of delivery.

Methods

This study used a prospective cohort design. The data were collected, from September 2012 to February 2013, during appointments for routine ultrasound examinations at 18–22 weeks of gestation in a prenatal clinic in a medical center situated in southwestern Iran by random sampling, that is explained in detail in another study [19]. 2029 pregnant women were enrolled at the time of receiving prenatal care at 18–22 weeks of gestation.

The selection criteria were first time pregnant women who: [1] were aged over 14 years [2], had a singleton fetus [3], had no medical-surgical or obstetric complications [4], could speak Persian and [5] agreed to participate in the study. The exclusion criterion was having planned to undergo a CS in advance.

The study was approved by the Human Research Review Board of Shiraz University of Medical Sciences. ID Research: No. 2013-6597, 20.12.2013. Each mother provided written informed consent before she was allowed to participate. A cohort of 2029 pregnant women was established. After obtaining a permit from the University, a trained health practitioner at the prenatal clinic explained the purpose of the study to the women and obtained their consents. Then, the study subjects were asked to fill out some questionnaires which are explained in detail in another study [19]. Women who were at 18–22 weeks of gestation were asked to recall their levels of physical activity before pregnancy with the question of “in general, comparing to before pregnancy, how much your activities (exercise or chores) have changed during pregnancy?” and the answers were classified into the three classes of “Decreased”, “Not changed”, “increased”.

The data were processed using the Statistics/Data Analysis (STATA.12 College Station, Texas USA). Descriptive statistics includes the frequency, percentage and frequency distribution of variables. The baseline characteristics of the two groups were compared using the chi-square test and t-test. To compare activities (exercise or chores) during pregnancy and pre-pregnancy, and to identify significant differences between the groups, the chi-square was employed. A multiple logistic regression was used to identify the association between activities (exercise or chores) during pregnancy and pre-pregnancy and delivery mode as well as controlling potential confounding variables. Goodness-of-fit (Nagelkerke R2) is the proportion of heterogeneity of mode of delivery explained by the independent variables in the model. Its value ranges from 0 to 1 and is directly related to the explanatory power of the model. The significance level was set at $P < 0.2$ for univariate analyses and $P < 0.05$ for multiple analyses.

Results

Formation of the study cohort is shown in Fig. 1. Women with Multiparas and a non-live fetus were excluded.

In total, 2029 pregnant women participated in the study, among which 1334 (65.84%) underwent CSs and 692 (34.16%) underwent NVDs. Most of the participants (89.26%) were aged between 19 and 34 years; more than seven-tenths of the mothers had an educational level of 9–12 years or above; the majority (87.88%) of participants had not worked outside home; the mean birth weight for the study participants' infants was 3107.01 (SD = 514.4333, range = 50–7600 g). The average gestational age was 38.74 weeks. More than half (55.92%) of the participants had decreased exercises or chores during pregnancy.

There were no significant differences in the type of pregnancy, history of abortion and stillbirth, birth height and head circumstance, between participants who underwent CSs and those who underwent NVDs (Table 1).

Activities (exercises or chores) during pregnancy, compared to pre-pregnancy, influences the birth pattern

Logistic regression was used to analyze the characteristics of activities (exercises or chores) during pregnancy, compared to pre-pregnancy, in women who underwent CSs. Those independent