

The Effects of Regular Exercise on Pregnancy Outcome

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Abstract

Background: Most women who report increased levels of physical activity are not at an increased risk of preterm delivery or reduced intrauterine growth. This study was conducted to look into the safety and effects of regularly timed aerobic exercises during pregnancy on both the mother and the neonate.

Methods: A prospective, case-control study was done on 120 healthy pregnant women in their first trimester. The data were collected in the prenatal outpatient care, labor and delivery rooms of a university-based Obstetrics Department. After completing basic information forms, the pregnant women were educated on the specific exercises in 8 stages throughout the pregnancy. Sixty-three patients presenting for delivery without any history of physical exercise were selected as the control group.

Results: There was no significant difference between the two groups regarding their occupation. The exercising group experienced significantly decreased durations of labor. There was no significant difference in neonatal birth weight or apgar scores. There were a significant decreased number of assisted deliveries in the exercising group.

Conclusion: Exercise during pregnancy shortens the duration of the second stage of labor and reduces the risk of assisted delivery while is safe for the neonate too.

Keywords: pregnancy; Exercises; Pregnancy outcome

Introduction

As the result of a number of recent studies on exercise in pregnancy, the debate over the risks of aerobic exercise in pregnancy has waned. It has been reported that in the absence of either medical or obstetric complications, 30 minutes or more of moderate exercise a day on most, if not all, days of the week is recommended for most pregnant women.¹ Several studies have looked into different levels of activity and their effects on pregnancy outcomes.¹⁻³ Most women who reported increased levels of physical activity were not at an increased risk of preterm delivery or reduced intrauterine growth.² In fact, studies have found that exercising women are at decreased risk for preterm delivery.⁴ Exercise in pregnancy could prevent and limit adverse maternal and fetal morbidities.⁵ Exercise

has been reported to reduce the occurrence of gestational diabetes mellitus and pre-eclampsia and may play a role in primary prevention of developing gestational diabetes mellitus^{6,7} while having no deleterious pregnancy outcome;³ with some authors recommending initiation of exercises in inactive women and continued exercises in those already active.⁷ This is a prospective, case control study conducted to look into the safety and effects of regularly timed aerobic exercises during pregnancy on both the mother and the neonate.

Materials and Methods

One-hundred and twenty healthy pregnant women attending prenatal outpatient care, labour and delivery rooms of Shiraz University of Medical Sciences-based Obstetrics Department (Zeinabieh and Hafez hospitals) were randomly divided into 12 groups. Interested women who were eligible, after completing the initial basic information forms were selected and

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education on the specific exercises was given to each participant in 8 stages. In each session, we assessed the learning and ability to perform previous exercises by 60 minutes: 1) techniques of body relaxation, and the effect of hormonal changes, fetal physiology of pregnancy and fetal growth on musculoskeletal changes during pregnancy, 2) correct positions of standing, walking and sleeping, 3) Kegel exercise method, 4) correct pelvic tilting, 5) education on breathing during labor and delivery, 6) education on the different stages of labor and a repeated session on breathing exercise, 7) education on combined breathing test and body (muscular) relaxation during labor and delivery, and 8) preparing the patient for delivery and a repeated session on breathing exercises. For every one of the exercises, the patients were instructed to practice for at least 15-20 minutes daily at home. During the educational process, we used exercise and practical training, slides and pamphlets. All the patients were instructed to stop the exercises and report immediately to the emergency room in the case of bleeding, low back pain, abdominal contractions or gush of fluid.

Sixty-three pregnant women that presented for delivery were selected as the control group. The conditions they had to fulfill were 1) primiparity, 2) age between 20 and 30 years, 3) non-smoker and non-drinkers, 4) minimum height of about 150 cm, and 5) having no medical problem as the case group but not having practiced any exercises during their entire pregnancy.

The data were collected in a valid and reliable form through direct observation and analyzed, using the SPSS statistical software program (Version 11.5, Chicago, IL, USA). Chi-Square and T tests were used to compare the results and a *P value* of less than 0.05 was considered significant. This study was approved and supervised by the Ethical Committee of the Shiraz University of Medical Sciences throughout its stages.

Results

Some patients were excluded from the study due to

preterm bleeding, preterm labor, and premature rupture of membranes in 2, 3, and 2 cases, respectively. Likewise, 41 patients underwent cesarean section and 8 did not refer to any of our centers for delivery. The patients were divided into employees and housewife groups for both the control and study cases. Housewives were the majority in both groups with 81.3% and 90.5% in the study and control groups, respectively. There was no significant difference between the two groups regarding their occupation ($P=0.14$).

As to their level of education, in the control group, 17.60% of the cases were illiterate or had basic literacy and in the study group 7.7% of the cases had university education with a significant difference ($P=0.02$). The average age difference between the study and the control groups was about 1 year, which was not significant ($P=0.13$; Table 1).

During labor, the average second stage duration was 13.3 minutes less in the study group compared to the control group, which was significant ($P=0.001$; Table 1). The neonatal birth weight averaged at 42.74 gm more in the study group compared to the controls, a difference that was not significant (Table 1).

For the total duration of the second stage of labor in the study group, 31% had less than 30 minutes duration compared to the control, while only 9.7% of the patients in the control group had a duration of less than 30 minutes, which showed a significant difference ($P=0.001$; Table 2). In both groups, neonatal birth weight was normal (2500-3500 gm; 82.8% and 84.1%, respectively) and the distribution of weight had no significant difference ($P=0.93$).

The first minute apgar score in the majority of neonates in both groups was 7-10 (98.4% and 93.7%, respectively). Only 1.6% of neonates in the study group and 6.3% of those in the control group had an apgar score of less than 7. Although the control group had a higher percentage of apgar scores less than 7, but this difference was not significant ($p=0.16$). The fifth minute apgar scores in all the neonates was normal.⁷⁻¹⁰

A majority of the patients in the exercising group had normal vaginal delivery (NVD) and NVD with

Table 1: Comparison of age, second stage duration and neonatal birth weight mean difference between case and control groups.

Variable	Case No.=64		control No.=63		P value
	Mean	SD	Mean	SD	
Age	22.5	3.01	21.8	2.42	0.13
Second stage duration	33.0	19.77	46.3	22.68	0.001
Neonatal birth weight	3107.3	393.07	3064.6	391.47	0.54

Table 2: Distribution of total second stage duration.

Second stage duration	Groups	Case		Control		Total	
		No.	%	No.	%	No.	%
< 30		29	45.3	9	14.3	38	29.9
30-60		30	46.9	43	68.3	73	75.5
> 60		5	7.8	11	17.5	16	12.6
Total		64	100	63	100	127	100

P < 0.001

episiotomy (87.5% and 73%, respectively) while the control group had 14.5% more patients with assisted delivery (vaginal delivery with episiotomy and vacuum), which showed a significant difference (*P*=0.04; Table 3).

Discussion

The data on exercise during pregnancy are limited but suggest that moderate exercise during a low-risk pregnancy does not lead to adverse outcomes for the fetus or mother and improves overall maternal fitness and well-being. The data examining the impact of exercise on labor outcomes, maternal weight gain and fetal weight are conflicting.^{5,8,9} Intrapartum exercises were shown in this study to significantly lower the duration of the second stage of labor. Elsewhere, it has been proposed that exercise may facilitate labor.¹⁰ In a study,¹¹ women randomized to pelvic floor muscle training had a lower rate of prolonged second stage labor than women allocated to no training, while other authors also agree that there is some evidence that weight-bearing exercises throughout pregnancy can reduce the length of labor and decrease delivery complications.⁸

In this study, it was shown that there was no significant difference in the neonatal birth weight between the exercising and non-exercising women. Hale¹² and Kardel¹³ showed corresponding results with those of our study. Many recent reports also indicate that randomized trials of exercise during pregnancy did not find, although did not exclude, a clinically important effect of exercise on birth weight.¹⁴ However, some authors have stated that fetal growth

seems to be influenced by maternal activity, as some investigations have found significantly bigger babies born by moderately trained females compared to non-trained or heavily trained women.^{4,15} It has been suggested that the infants of mothers who exercise a great deal are leaner than average but are average in length,¹⁶ and that exercise in working women is associated with smaller babies, increased number of inductions and augmentations of labor, and longer labors with colds and flu being more frequent in exercising women.¹⁷ Others also suggested that infants born to the women who exercised were significantly heavier and longer than those whose mothers did not exercise.¹⁸ The fact that different exercises were taught for all the patients in these studies and also the socio-cultural variation may explain this difference. For instance, the differences in these results may be due to the number of subjects, and type and quality of the exercises used in these studies.

There was no significant difference in apgar scores at birth in the neonates of exercising and non-exercising mothers in our study. Kardel,¹³ Botkin and Driscoll,¹⁹ and Lokey²⁰ also reported that the first and fifth minute apgar scores of neonates of exercising and non-exercising mothers did not differ. This may suggest that the concern over the fetomaternal or neonatal well-being of moderate exercises during pregnancy may be unfounded, although it's too early in the course of research for a conclusive generalization. The evidence suggests that, in most cases, exercise is safe for both the mother and fetus during pregnancy and women should, therefore, be encouraged to initiate or continue exercises to derive the health benefits associated with such activities.

Table 3: Distribution of different NVD methods.

Variable	Groups	Case		Control		Total	
		No.	%	No.	%	No.	%
NVD with Epi		56	78.5	46	73	102	80.3
NVD with Epi and vaccum		8	12.5	17	27	25	19.7
Total Epi		64	100	63	100	127	100

P=0.04

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