Regular Moderate Exercise Throughout Pregnancy Not Associated with Increased Risk of Preterm Delivery


Study Overview

Objective. To evaluate if exercise during pregnancy has an effect on the risk of preterm birth.

Design. Systematic review and meta-analysis of randomized controlled trials.

Study selection. The authors followed the protocol for conducting meta-analyses recommended by the Cochrane Collaboration. MEDLINE, EMBASE, Web of Science, Scopus, ClinicalTrials.gov, OVID, and the Cochrane Library were searched from the inception of each database to April 2016. Selection criteria included randomized clinical trials that examined the effect of aerobic exercise on preterm birth. Keywords included exercise or physical activity and pregnancy and preterm birth or preterm delivery. Studies were included only if women were randomized to an aerobic exercise program prior to 23 weeks, participants had uncomplicated singleton pregnancies and no contraindication to exercise, and preterm birth was an outcome.

Nine studies met the inclusion criteria and were included in the meta-analysis. The quality of included studies was good overall, with most studies having low risk of selection or attrition bias and low or unclear risk of reporting bias. Most of the studies did not include blinding of participants and research personnel or of the outcome assessment. Sample sizes ranged from 14 to 697, with 2 studies with < 100 participants, 3 with 100 to 200 participants, and 3 with 290 to 687 participants. All of the women randomized to the experimental group began an exercise program by 22 weeks’ gestation. The types of physical activity used in the experimental group included strength and flexibility training, cycling, stretching, resistance, dance, joint mobilization, walking, and toning. Participants engaged in the activity for 35 to 90 minutes (mean, 57 minutes) 3 times a week in 8 studies and 4 times a week in 1 study. The intensity of the aerobic activities ranged from less than 60% to less than 80% of age-predicted maximum heart rate. Participants in 3 control groups were explicitly told not to engage in exercise while those in the others were neither encouraged or discouraged from doing so.

Main outcome measure. Incidence of preterm birth (birth prior to 37 weeks’ gestation).

Main results. A total of 2059 women were included in the meta-analysis, with 1022 in the exercise group and 1037 in
the control group. The incidence of preterm birth was similar in the experimental and the control groups (4.5% vs 4.4% respectively, 95% confidence interval [CI], –0.07 to 0.17). The mean gestational age at delivery was also similar, with a mean difference of 0.05 (95% CI, –0.07 to 0.17). Women in the exercise group had a decreased risk of cesarean delivery (0.82%), with 17.9% having a cesarean delivery compared to 22% in the control group (95% CI, 0.69 to 0.97).

Conclusion. Exercise during pregnancy in women with singleton, uncomplicated pregnancy is not associated with increased risk of preterm delivery. Additionally, it is associated with a decreased risk of cesarean delivery.

Commentary

Preterm birth accounts for most perinatal deaths in the United States and places surviving infants at risk for serious short- and long-term health problems [1]. Though the rate of preterm births in the United States has been slowly declining in recent years, at 9.57% it continues to be one of the highest among high-income countries [2]. Determining factors that contribute to incidence of preterm birth is critical to reducing this unacceptably high rate. According to the authors of this meta-analysis, the role of exercise related to preterm birth remains controversial due to past beliefs that the increased release of catecholamines during exercise would stimulate myometrial activity and ongoing concerns about possible adverse effects. The health benefits of regular exercise are well-known, including in pregnancy where it has been shown to lower the risk of gestational diabetes and preeclampsia.

Researchers have investigated exercise during pregnancy in earlier reviews; however, this appears to be the first with both preterm birth as the primary outcome and an adequate number of clinical trials in the sample. Prior reviews that examined the effects of exercise on preterm birth, either specifically or as one of a number of pregnancy outcomes, included only 3 to 5 studies pertaining to preterm birth [3–5].

The strengths of this review were the low statistical heterogeneity and high quality of the included studies, lack of publication bias, and the large sample of 2059 participants. As noted by the authors, however, lack of stratification by body mass (underweight, overweight, obese), differences in the types and intensity of exercise among interventions, as well as possible differences in adherence may have affected outcomes. In addition, in 6 studies women in the control group were not specifically instructed to refrain from exercise and there is no information about their exercise habits. The risk of contamination bias exists because some of these women may have engaged in a regular program of exercise. However, considering that levels of regular exercise in pregnant women are low, it is unlikely that this would occur at a rate that would have a significant effect on the outcomes [6].

Applications for Clinical Practice

The results of this meta-analysis provide strong support for the American College of Obstetrics and Gynecology recommendation that women with uncomplicated pregnancies be encouraged to engage in moderate-intensity exercise 20 to 30 minutes per day during pregnancy [7]. Clinicians should advise all women with uncomplicated singleton pregnancies and no medical contraindications to engage in regular aerobic and strength-conditioning exercise throughout their pregnancy.

—Karen Roush, PhD, RN

References

Can Patient Navigators Increase Cancer Screening Rates in Primary Care Practice?


Study Overview

Objective. To evaluate patient navigation (PN) for breast, cervical, and colorectal cancer (CRC) screening using a population-based information technology (IT) system within a primary care network.

Design. Randomized clinical trial.

Setting and participants. Patients were from 18 primary care practices in the Massachusetts General Primary Care Practice-Based Research Network, which included 4 community health centers. The study used a population health IT application (TopCare [SRG Technology]) to identify patients overdue for breast, cervical and/or CRC screening. Women were deemed eligible and overdue for breast cancer [1] and cervical cancer [2] screening based on United States Preventive Services Task Force (USPSTF) recommendation statements. Patients aged 50 to 75 years without prior total colectomy were considered eligible for CRC screening and overdue if they did not have a colonoscopy in the past 10 years or sigmoidoscopy/barium enema/colonography in the past 5 years.

The study identified patients at high risk for non-adherence via a point system based on history of non-adherence to cancer screening tests, missed appointments, and primary language spoken (non-English speaking). A total of 1956 patients were identified, and after excluding those who were participating in an existing PN program, left the primary care network, died, or were lost to follow-up, the final study population consisted of 1612 patients overdue for at least 1 screening at the start of the study period.

Intervention: The intervention was a PN program comprising 4 part-time patient navigators with at least 2 years’ experience with cancer navigation and who worked 50% of their time in other PN programs. The navigators tracked intervention patients using the IT system, contacted them in their own language, and used extensive outreach efforts to assist them in completing their cancer screening. Most contact with patients took place via phone calls.

Main outcome measures. The primary outcome was the mean cancer screening test completion rate over the follow-up period for each eligible patient, with all eligible cancers combined in intention-to-treat analyses. Secondary outcomes included assessing the proportion of patients completing any and each cancer screening during follow-up among those who were eligible and overdue for at least 1 cancer screening at baseline in intention-to-treat analyses. Additionally, as-treated analyses were conducted, in which patients who left the network or died during follow-up were removed from the intervention and control groups and patients who could not be reached were removed from the intervention group.

Results. A total of 792 patients were randomized to the intervention group (PN) and 820 patients were randomized to usual care. The mean age in the intervention and control groups was 56.9 and 57.1 years, respectively. The intervention and control groups were well-matched in terms of sex, primary language, insurance, proportion of patients connected to a specific physician or seen in a community health center, number of clinic visits over the past 3 years, and risk for nonadherence. Among patients eligible and overdue for cancer screening, mean cancer screening completion rates were higher in the intervention group compared with the control group for all cancers combined (10.2% vs 6.8%; 95% CI [for the difference] 1.5% to 5.2%; P < 0.001) and for breast (14.7% vs 11.0%; 95% CI 0.2% to 7.3%; P = 0.04), cervical (11.1% vs 5.7%; 95% CI 0.8% to 5.2%; P = 0.002), and colon (7.6% vs 4.6%; 95% CI 0.8% to 5.2%; P = 0.01) cancer. The secondary outcome, the proportion of overdue patients who completed any cancer screening test, was also higher in the intervention group (10.2% vs 6.8%; 95% CI 1.5% to 5.2%; P < 0.001).
screening during follow-up, was higher in the intervention group (25.5% vs 17.0%; 95% CI 4.7% to 12.7%; \( P < 0.001 \)). More patients in the intervention group completed screening for breast (23.4% vs 16.6%; 95% CI 1.8% to 12.0%; \( P = 0.009 \)), cervical (14.4% vs 8.6%; 95% CI 1.6% to 10.5%; \( P = 0.007 \)), and colorectal (13.7% vs 7.0%; 95% CI 3.2% to 10.4%; \( P < 0.001 \)) cancer. The effect size increased in the as-treated analyses.

**Conclusion.** PN, using a health IT application, improved cancer screening completion rates among patients at high risk for nonadherence over an 8-month period in an academic primary care network.

**Commentary**

The potential of PN to help individuals traverse the complexity of the current health care system continues to attract great interest as value-based care becomes a reality for physicians and health systems. Several studies have demonstrated PN to be an effective modality to improve adherence to recommended screenings [3–5]; however, issues surrounding cost, patient perception, and the “outsourcing” of care from the primary care physician to navigators require attention. At this time, the most robust aggregation of data demonstrating benefit outweighing harm for cancer screening is published by the USPSTF [6]. Breast cancer [7], cervical cancer [8], and CRC [9] have the greatest weight of evidence to support screening.

The study was conducted at a single academic medical center with established IT infrastructure and an established PN program, which limits application of the results to large networked organizations and/or private practice settings. One important limitation in the CRC screening component was the lack of alternatives to colonoscopy. Studies have demonstrated greater adherence to CRC screening with methods other than colonoscopy [10], especially among racial/ethnic minorities. Although the authors estimate the intervention cost approximately $100,000, the study does not include the cost of the population health IT solution. The costs associated with both the IT solution in addition to PN may ultimately outweigh the benefits. The short time frame of the study may also limit effect size and add to long-term cost considerations. Lastly, a high percentage of patients randomized to the intervention group were unable to be contacted, declined PN services, had competing comorbidities, or were screened elsewhere. On the other hand, the study has several strengths. Statistically, the study utilized intention-to-treat analyses, where estimate of treatment effect is generally conservative. As compared to the current literature, the authors evaluate 3 different types of cancer—a pragmatic approach from a clinician’s perspective. Additionally, the authors focused efforts on individuals at high risk for nonadherence, a strategy also practicable by clinicians. Another realistic element of the study is that patient navigators had other responsibilities, which implies applicability to resource-limited settings.

**Applications for Clinical Practice**

PN has been shown to be an effective means of improving population-based health outcomes, and this study demonstrates it improves cancer screening rates, assuming the appropriate IT infrastructure is in place. The costs and benefits of PN should be assessed when considering use of PN in nonadherent populations, and PN interventions should be tailored to available resources and the unique practice environment.

—Ajay Dharod, MD

**References**
