Changes in depression status in low socioeconomic perinatal subjects in rural India after supervised physical exercise: A randomized controlled study

Gopal Nambi Subash Chandra Bose
College of Applied Medical Sciences, Prince Sattam Bin Abdul Aziz University, Al-Kharj, Kingdom of Saudi Arabia

ABSTRACT

**Background:** Perinatal depression is a major public health problem, affecting up to a quarter of all pregnant women in rural Asian countries and often leads to psychologic symptoms, lower quality of life, and higher health care costs. The purpose of this study was to assess the impact of supervised physical exercise on depression level of perinatal subjects.

**Subjects/Intervention:** 60 subjects who fulfill the selection criteria were randomly assigned to exercise (Group-1, n=30) and control group (Group-2, n=30). Participants completed general screening form and Physical health questionnaire-9 (PHQ-9) before their intervention and again 4 weeks and 8 weeks later. Group-1 underwent aerobic training with 60-65% maximum heart rate and Group-2 was prescribed with handouts for 4 weeks.

**Statistics:** Repeated-measures analysis of variance (ANOVA) was used to analyze group differences over time while controlling for baseline differences.

**Results:** Demographic and the baseline values show homogenous population (P>0.05). Patients in both groups experienced significant reduction in depression level. Group A showed reduction of 91.70% (P=0.00) as compared to Group B 69.01% (P=0.00).

**Conclusion:** These results suggest that supervised physical exercise provides better improvement in depression status in perinatal subjects than providing handouts alone.

**Key words:** Depression, perinatal, physical exercise, Physical Health Questionnaire-9

INTRODUCTION

Perinatal depression is a major public health problem, affecting up to a quarter of all pregnant women in rural countries. It is associated with profound physical and emotional changes and associated risks for the onset or exacerbation of several mental disorders such as depression.[1] In addition to its effects on the mother’s well-being, perinatal depression is associated with adverse outcomes of pregnancy. Relevant effective interventions are being developed, but their effectiveness in low- and middle-income countries may be limited by various factors.[2]

Exercise can provide a viable treatment options for depressed patients, whether as an alternative treatment strategy to conventional treatments or as a supplemental strategy, either in the short-term or long-term.[3] Research to date by low numbers to support the use of exercise in some form as a positive treatment option for individuals suffering from depression.

METHODS

Perinatal depression subjects from rural sub-district (Sayla) of Surendranagar district, Gujarat, India were selected. All
married women aged 17–40 years with low socioeconomic status in their second trimester of pregnancy, who had depression, were considered. Women with a diagnosed medical condition, pregnancy-related illness, significant physical or intellectual disability, post part tumor other form of psychosis, and severe depressions were excluded.

**Study design**

During the pre-intervention assessment, subjects have undergone Kuppuswamy’s socioeconomic status scale and the Physical Health Questionnaire-9. Data collectors were blind to the treatment status. Subjects were randomized to one of two subgroups of 30 (i.e. Groups 1 and 2) during January 2012 to December 2012. Both groups were asked to attend post-intervention assessment 4 and 8 weeks following the start of the program to complete the questionnaire.

**Exercise group**

Subjects in this group had a 4 weeks exercise program, cycle 4 sessions a week for 40–60 min/session. The exercise in each session were including: 10 min heating with walking, stretching and flexibility, and three sets of moderate intensity cycling in 6 min with 60–65% of maximum heart rate.

**Control group**

Subjects in the control group were given a patient handout which is in Gujarati explaining about the procedures to do as home based program. The hand out consist of five criteria such as stay active, do something that you think is fun each day, spend time with people who help or support you, relaxing and set simple goals. The entire program lasted for 4 weeks.

Inter group analysis was done using Wilcoxon-Mann-Whitney test and intra group analysis was done using one-way ANOVA. \( P < 0.05 \) were accepted.

**RESULTS**

Of 146 subjects, 80 (55%) met the inclusion criteria and 60 (41%) agreed to enroll. Four subjects were excluded from the analysis in the exercise group (Group 1) and 2 subjects were excluded from analysis in the control group (Group 2).

No significance differences between groups were found at baseline on outcome variable such as depression level. Analysis of depression level shows significant changes within and between exercise and control group. At baseline, the mean depression score was 15.96 (3.09) and 16.23 (3.38) for the exercise group and the control group, respectively. After the 4-weeks intervention, the mean score fell to 6.10 (2.44) for the exercise group (43.54%) and to 10.60 (2.74) for the control group (21.25%). At the 8 weeks follow-up, the mean score was 1.34 (1.09) for the exercise group (72.81%) and 5.03 (1.50) for the control group (42.50%).

**DISCUSSION**

Exercise has been shown in a number of studies to prove beneficial in the treatment of depressive symptoms especially in perinatal and post natal conditions. Bartholomew showed that a single incidence of exercise can have a positive effect on mood. Maintaining the intensity and frequency of exercise recommended by most public health agencies were sufficient to provide a significant reduction in major depressive disorder (MDD) symptoms.[4]

Exercise causes neurogenesis through the enhancement of four molecules counteracting the impact of MDD. The additional benefits of exercise to individuals suffering from depression include stress reduction, better attitude, improved outlook, self-confidence, and mental well-being.[5] Our intervention, the “physical exercises” was developed to provide a culturally appropriate, feasible, and evidence-based physical therapy intervention for women living in very poor communities in rural India.

**CONCLUSION**

These results suggest that supervised physical exercise provides better improvement in depression status in perinatal subjects.

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