Original Article

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Physical Activity and Pelvic Girdle Pain in Pregnancy: A Cross-sectional Study

Physiotherapy Section

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ABSTRACT

Introduction: Physical Activity (PA) is an important component of a healthy pregnancy, for both the mother and her child. Sedentary lifestyle during pregnancy may increase development of pregnancy related musculoskeletal discomforts. Studies showed that 25% of women experience severe Pelvic Girdle Pain (PGP) during pregnancy and 8% are severely disabled due to PGP.

Aim: To analyse the association between the PA and PGP during pregnancy.

Materials and Methods: This cross-sectional study was conducted at antenatal Outpatient Department (OPD), Sri Ramachandra Hospital, Chennai, Tamil Nadu, India from November 2019 to March 2020. Total 250 mothers were screened and finally 150 participants were selected. They were asked to fill-up the Pregnancy Physical Activity Questionnaire (PPAQ), Pregnancy Musculoskeletal Dysfunction Scale (PMDS) to assess the PA level and musculoskeletal dysfunction. Mothers who complaints of PGP were clinically diagnosed and were asked to fill the Pelvic Girdle Questionnaire (PGQ). Data was analysed using Statistical Package for the Social Sciences (SPSS) version 20.0.

Results: A total of 26 (17.33%) pregnant women in this study had PGP. The association between the total PA and PGP showed that the risk of PGP decreased as the PA increased which was statistically significant (p-value=0.03). PGP was also significantly associated with increased body weight (p-value=0.014).

Conclusion: It was found that there was an association between total PA and PGP in pregnancy. Increased PA is associated with reduction in PGP. Hence, moderate PA is recommended during pregnancy.

Keywords: Gestational period, Lifestyle, Pelvic girdle pain, Pregnancy discomforts, Pregnancy physical activity, Symphysis pubic pain

INTRODUCTION

Our modern popular culture has embraced the concept of a "fit pregnancy" which has health benefits of exercise. Infact, currently PA is an important part of different populations including pregnant women and the pregnant mothers are encouraged to include exercise as part of a healthy lifestyle. Adults (18 to 64 years) should indulge in atleast 150 minutes of moderate intensity aerobic PA all through the week or vigorous intensity aerobic PA for 75 minutes or an equivalent combination of the two-World Health Organization (WHO) guidelines on PA [1].

The PA is important for both the child and the mother and for a healthy pregnancy. Recent epidemiologic studies have shown that women who are more active during pregnancy may have reduced risk of gestational diabetes, hypertensive disorders and preterm birth in developed countries [2,3]. PA produces a thermal response and circulatory redistribution, shifting the blood concentration from the uterus and placenta to the extremities. During pregnancy the physiological responses to exercise such as changes in heart rate, cardiac output, ventilation and energy expenditure are increased than prepregnancy. As the energy requirement is altered during pregnancy due to maternal and foetal requirement, modification of exercise pattern and understanding the guidelines are important [4].

Pregnant women who are active had shown reduced length of labour, reduced fatigue and improved mental health (stress, anxiety and depression) as well as improved self-esteem. Inspite of several recommendations on pregnancy PA, the adherence of PA during gestation yet seems to be low worldwide [5]. Maternal changes during gestation leads to musculoskeletal disorders such as upper back pain, lower back pain, PGP, leg cramps, and upper and lower limb pain. The most common pregnancy related musculoskeletal problems that impact pregnant women well-being are Low Back Pain (LBP) and PGP. PGP is characterised as belt like pain around waistline or between the posterior iliac crest and the gluteal fold, especially over the Sacroiliac Joint (SIJ) and pubic symphysis sometimes it may radiate to the thighs and hips [6].

A study by Ramachandra P et al., reported that 25% of women experience severe pelvic pain during pregnancy and 8% are severely disabled due to PGP. A 31.7% of pregnant women with PGP reported pain in the symphysis pubis region [7]. Women with PGP had complained of reduced capacity for carrying out their daily activities such as standing, walking and sitting. Specific clinical tests such as posterior pelvic pain provocation test reproduce the pain or functional disturbances. The experiences of PGP symptoms are worse than lumbar pain and most leading factor for functional disability among pregnant women. The physical disability due to PGP is the one of the reasons for increased sick leave at workplace during pregnancy and has important psychosocial implications. Severe PGP results poorer quality of life and predisposition to chronic pain syndrome [8]. Thus, a specific focus on PGP and physical exercise are required to examine if the amount and type of exercise have an impact on pelvic girdle in pregnancy.

Furthermore, findings indicate that joint laxity is more in sedentary group as the pregnancy progress and the sedentary lifestyle during pregnancy may increase the development of pregnancy related discomfort than the mothers who involve in leisure time physical activities [7]. As there is dearth of literature on PA level and PGP, this study aimed to assess the association between the PA and PGP during pregnancy.

MATERIALS AND METHODS

This cross-sectional study was conducted at antenatal OPD, Sri Ramachandra Hospital, Chennai, Tamil Nadu, India, during November 2019 to March 2020. Ethical clearance was obtained from Institutional Ethical Committee (CSP/19/ NOV/ 81/ 381). A written informed consent was obtained from all the patients and were asked to fill up the questionnaires in their convenient language (Tamil or English). The primary outcomes were PPAQ, PMDS and

PGQ. Initially pregnant womens were asked to fill up PPAQ and PMDS questionnaire.

Inclusion criteria: Patients aged 21-36 years, gestational age of second and third trimester were included in the study.

Exclusion criteria: High risk groups such as placenta previa, severe hypertension, cervical encirclage, seizure disorders, uncontrolled gestational diabetes, respiratory disease, renal disease, cardiac problems and history of previous miscarriage were excluded from the study.

Sample size calculation: With a prevalence of 15%, 95% confidence interval and the margin of error as 5%, sample size was calculated as 195 [9]. Total 250 pregnant women were screened and finally 150 participants were selected according to the inclusion and exclusion criteria.

Questionnaire

The Pregnancy Physical Activity Questionnaire (PPAQ) developed by Chasan-Taber L et al., was used to assess the PA levels among pregnant women. It includes questions on trimester specific PA [10]. PPAQ contains 32 activities (36 items) which measures five areas: Household/care giving activities, occupational, sports/exercise, transportation, and sedentary activities [11]. The number of hours spent in each activity are multiplied by the activity intensity to arrive at a measure of average daily energy expenditure {Metabolic equivalents (MET)-hours per day} attributable to each activity. Activities are categorised by intensity (i.e., light, moderate, vigorous), type (i.e., household, occupation, sport), or as total activity. The Pregnancy Musculoskeletal Dysfunction Scale (PMDS) developed with 16 items of pregnancy discomforts by Sathyaprabha B et al., which contains demographic data, parity, musculoskeletal discomfort severity with interference with their daily routine [6].

Mothers were asked to mark on the body chart for better illustration of symptoms. Those mothers who marked over the pelvic girdle alone were examined by a trained physiotherapist who performed the active Straight Leg Raising (SLR), posterior pelvic pain provocation test to distinguish the PGP from the lumbar pain [6]. The mothers who were confirmed with PGP were asked to fill up the Pelvic Girdle Questionnaire (PGQ). The self-reported PGQ developed for people with PGP consist of 25 items. The items focus on activity related questions (20 items) and details of symptoms (5 items). Each item scored on a 4-point likert scale, from 'Not at all' -0- to 'To a large extent'-3. Final item scores are summed and transformed as 0 to 100, where 100 is the worst possible score [12]. For queries and clarifications while filling up questionnaire and to distinguish the symptoms, a physiotherapist assisted the mothers in outpatient department.

STATISTICAL ANALYSIS

The statistical analysis was performed by using SPSS software version 20.0. The association between the occupation, obstetric history, gestational age, PA and PGP were analysed by Chi-square test. A p-value <0.05 was considered significant.

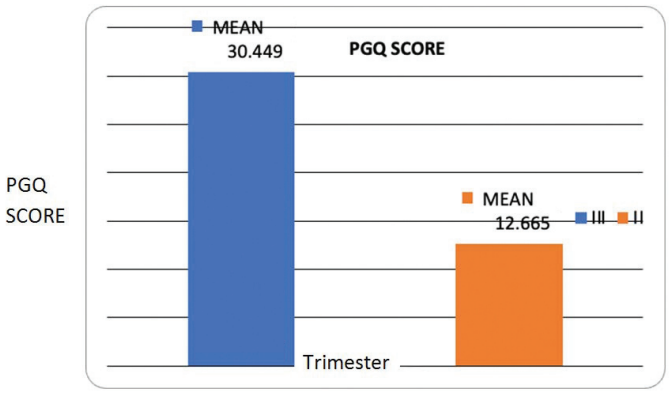
RESULTS

The mean age of the study participants were 26.05±3.41. The baseline characteristics of the participants are given in [Table/Fig-1]. 36 (24%) of the study participants were in the second trimester and 114 (76%) were in third trimester. The prevalence of PGP in the study population was 26 (17.33%); and 6/36 (16.67%) in second trimester and 20/114 (17.54%) in third trimester. Mean PGQ score was more in pregnant women in their third trimester [Table/Fig-2]. As the gestational age increases, complaints of PGP is increased which was not statistically significant [Table/Fig-3].

The association between the total PA and PGP shows that the risk of PGP decreases as the PA increases which was statistically significant (p-value=0.03) [Table/Fig-4]. As the body weight increased the risk of developing PGP also increased and was statistically significant with p-value=0.014 [Table/Fig-5].

Variables	Mean±SD
Age (years)	26.05±3.41
Height (cm)	156.04±6.17
Weight (kg)	67.27±11.01
BMI (kg/m^2)	27.65±4.45

[Table/Fig-1]: Baseline characteristics of participants (N=150).



[Table/Fig-2]: PGQ score among participants.

Occupation and PGP			
PGP	**Homemaker, n (%)**	**Working, n (%)**	**p-value**
Absent	112 (74.67)	12 (8)	0.216
Present	22 (14.67)	4 (2.66)	
Obstetric history and PGP			
PGP	**Primi, n (%)**	**Multi, n (%)**	**p-value**
Absent	71 (47.33)	53 (35.33)	0.164
Present	11 (7.33)	15 (10)	
Gestational age and PGP			
PGP	**Second n (%)**	**Third n (%)**	**p-value**
Absent	30 (20)	94 (62.67)	0.904
Present	6 (4)	20 (13.33)	

[Table/Fig-3]: PGP complaints, Occupation, Obstetric History and Gestational age. Chi-square test

PGP	Total physical activity score				p-value
	95 and below	95-164	165-225	225 and above	
Absent n (%)	35 (23.33)	30 (20)	33 (22)	26 (17.33)	0.03
Present n (%)	15 (10)	5 (3.33)	3 (2)	3 (2)	

[Table/Fig-4]: Association between Total physical activity and PGP.
p-value <0.05 considered significant; Chi-square test
OR=3.025, 95% CI (1.138-8.046); RR=2.549, 95% CI (1.086-5.983); p=0.021

PGP	Body weight (kg)				p-value
	60 and below	60-67	68-73	73 and above	
Absent, n (%)	31 (20.67)	39 (26)	32 (21.33)	22 (14.67)	0.014
Present, n (%)	6 (4)	5 (3.33)	3 (2)	12 (8)	

[Table/Fig-5]: Maternal body weight and PGP.
p-value <0.05 considered significant; Chi-square test

DISCUSSION

The Physical Activity (PA) is an important component of a healthy pregnancy to reduce the risk of any medical complication. On the basis of research over the past 30 years, current guidelines published by the American College of Obstetricians and Gynaecologists, as well as Society of Obstetricians and Gynaecologists of Canada recommends PA for pregnant women [13]. Indeed women who are pregnant and healthy are recommended to do 30 minutes

or more of light to moderate exercise. The possible causes of all musculoskeletal problems in pregnancy are due to joint laxity which is considered to be more in sedentary group as pregnancy progress [2,3]. Thus the present study focused the association between the PA and PGP among the pregnant women. Most of the women were in light and sedentary category of PPAQ score based on intensity of work. PGP complaints were more among women with lower PA score (p-value=0.03).

Biering K et al., stated that there is an association between pregnancy-related PGP and pre pregnancy BMI. High pre pregnancy BMI is a potential risk factor for pregnancy complication. Obesity results various musculoskeletal discomforts including PGP [14]. Similarly, the present study also showed an association between increase in maternal body weight (p-value=0.014) and the risk of PGP. Bjelland EK et al., concluded that the risk of development of pelvic girdle syndrome was associated with increased number of previous deliveries [15]. In the present study the PGP among primiparous mothers were 7.33% and multi mothers were 10%, the clinical association showed an increase in parity increases the PGP but was not statistically significant.

Though women experience musculoskeletal discomforts during pregnancy and one tenth are severely disabled due to PGP, there is a lack of psychometrically accepted measurement tool to assess the pregnancy induced musculoskeletal symptoms [6]. Pregnancy musculoskeletal scale developed by Sathyaprabha B et al., was found to be a valid tool. They had observed the prevalence of pelvic pain was 22% in second trimester and 28% in third trimester. The present study shows as the gestational age increases the PGP also increases. It was observed that most of the patients with PGP had history of long standing work profile of house hold chores or vocational, habitual single leg standing, prolonged sitting, sedentary lifestyle and vigorous PA. These factors could be the aggravating or precipitating factors for PGP as shared by the patients with PGP [6]. The altered posture and abnormal mechanical stress over pelvic girdle due to weight gain and improper ergonomics can impair and challenge the stability and mobility of pelvic girdle supporting structures. Not only the PA level, appropriate lifestyle habits also influenced PGP in pregnant women [7].

Davenport MH et al., concluded that compared with not exercising, prenatal exercise decreased the severity of LBP, PGP during and following pregnancy but did not decrease the odds of any of these conditions at any time point [16]. Similarly pregnant women attending regular fitness classes reported complaints of musculoskeletal problems (LBP and PGP) [17]. The present study showed association between physical activity and PGP in pregnancy and an increased PA was associated with a reduced risk of PGP which was statistically significant [OR=3.025, 95% CI (1.138-8.046); RR=2.549, 95% CI (1.086-5.983); p-value=0.021].

Limitation(s)

The main limitation of the present study was the small sample size. More studies with larger sample size are required to validate the results.

CONCLUSION(S)

The association between the total Physical Activity (PA) and Pelvic Girdle Pain (PGP) showed that the risk of PGP decreases as PA increases which was statistically significant. Hence, moderate PA is recommended during pregnancy.

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