Original Article

Disability in Pelvic Girdle Pain in Relation to Dynamic Balance a Functional Performance

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Abstract

Pelvic girdle pain is a common musculoskeletal condition in the community. According to fear-avoidance beliefs model, the anticipation of increased pain or further evokes thee avoidance behaviour causing disability.

Aim: The study aimed to correlate fear-avoidance beliefs with dynamic balance functional performance, Disability in Pelvic Girdle pain patients. Settings and design: A cross-sectional study was conducted in 75 chronic pelvic girdle pain patients in tertiary care hospital.

Subject and methods: pain fear-avoidance beliefs, dynamic balance, and disability were assessed in chronic pain patients. Pain was evaluated using the numerical pain rating scale, fear avoidance using the fear-avoidance belief questionnaire (FABQ), disability using the roland morris disability questionnaire, dynamic balance using the minibest test, and functional performance using the back performance scale. Statistical analysis used: statistical measures such as median and interquartile ranges were calculated. The spearmen's correlation test was used.

Result: there was a low correlation between FABQ and pain (r=0.431,=0.000), dynamic balance (r=-0.425, p=0.000) and functional performance (r=0.482, p=0.000) and moderate positive correlation with disability (r,=0.538, P=0.000) in chronic pelvic pain patients.

Conclusions: fear-avoidance beliefs are significantly associated with pain, dynamic balance, functional performance, and disability in chronic low back pain patient.

Keywords: chronic pelvic girdle pain, disability, dynamic balance, fear-avoidance belief.

Introduction

The lifetime prevalence of Pelvic Girdle pain was found to be 57% in India wherein prevalence in females (65%) was higher than the prevalence in males (47)[1]. PELVIC Girdle pain persistent for more than 3 months is termed Chronic Pelvic Girdle pain

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and is the leading cause of disability worldwide. Recently, the authors have started focusing on contribution of psychosocial factors and their effect on individuals suffering from chronic Pelvic Girdle PAIN[2]. The presence of psychosocial factors such as fear of pain, catastrophization and depression after experiencing pain, results in fear of movement, thus leading to disuse and causing disability.[3] Fear-avoidance beliefs are considered an important psychosocial factor in predicting patient's avoidance of work and physical activity as well as disability.[4] It can lead to negative consequences such as disuse syndrome further causing physical deconditioning , sick role behavior, psychosocial withdrawal, and negative affect corresponding to a high level of disability.[5] Long-term avoidance behavior also detrimentally affects muscle strength, coordination, and physical fitness.[6] Further evidence also suggest that patients with Pelvic Girdle pain have impaired dynamic balance [7]. It was proposed that the balance impairment in Pelvic Girdle pain patients is associated with deficits in the musculoskeletal and neural systems.[8] Multiple studies have reported that chronic Pelvic Girdle pain may lead to difficulty or inability in performing functional tasks which further results in reduced mobility. Movements such as lumbar flexion, extension, and rotation have been recognized as common movements which elevate or aggravate the pain and elicit fear and avoidance behavior in individuals[9]. Limitations and avoidance of physical activities due to fear of pain can contribute to physiological changes in motor patterns, thus reducing the performance overall[7]. Previous studies done on Pelvic Girdle pain focused on pain, physical performance, and disability individually. Hence, making it imperative to check if these factors have an impact in chronic Pelvic Girdle pain patients. Thus, our study aimed to correlate fear-avoidance beliefs with dynamic balance functional performance and disability in chronic Pelvic Girdle pain patients. It is necessary to check the prevalence to understand how vast the occurrence is and accordingly build up on the treatment option for them. In India, there has been only one study documented in Karnataka, it showed a prevalence rate of 65% in posterior pelvic pain and 15% in anterior pelvic pain. Urban population showed a higher percentage of 75% as compared to 25% in the rural population.[27] In a random sample of 780 Australian women, the point prevalence of PPGP was 44%. In late pregnancy, the prevalence of self-reported PGP was at its peak at 7.3%.[28] It has been seen that one out of seven women suffer at 36 weeks' gestation with PGP, and almost half of the women suffering in the postpartum three months after delivery[28] Geographically, increased awareness regarding PGP has a higher rate accredited to health-care providers and the public. However, PGP cases are reported from many countries and across all continents, indicating that PGP in pregnancy is a globalproblem.[29] PGP decreases endurance in standing, walking, and sitting. It also interferes with lifting, getting up from chairs, turning over in bed, getting out of a vehicle, and changing body position. Toilet activities are difficult, especially in pregnancy with the increased body mass index and the pain not allowing the spread of legs. This pain affects the delivery stage too. Studies have shown that postpartum anxiety and depression have a major precursor with pelvic girdle dysfunction. There is now a study titled 'Mortality and Morbidity in Pelvic Girdle Pain' which examines the prevalence of pelvic girdle pain globally. Cultural practices and lifestyles vary widely across geographical areas, and these may have their impact on the reaction to pelvic girdle pain. Studies have shown, it may lead to prolonged suffering, marital and family problems, loss of employment or disability, and various adverse medical reactions from lifelong therapy. As such in chronic pelvic pain patients have no mortality in chronic pelvic pain unless it is cancer.

Material and Methods

A prospective, cross-sectional study was conducted in the physical medicine & rehabilitation outpatient department Muzaffarnagar medical college A total of 75 chronic low back pain patients were recruited after the approval from the ethics committee of the institution. Written informed consent was obtained from the participants. The study period was 8 months from May 2023 to December 2023. The inclusion criteria were participants having low back pain for more than 3 months, both males and females and between 41 and 59 years of age. Exclusion criteria were history of the upper limb, lower limb, or back surgeries, any neurological or cardiovascular conditions, any trunk, upper limb

or lower limb deformities, history of radiculopathy, spinal fractures, malignancy or congenital conditions. Considering the confidence interval as 0.05, power as 80%, and correlation coefficient as 0.3225 from a previously published study, 10 the sample size was determined as 74. The basic demographic data (age, height, weight, body mass index, marital status, education, occupation, and comorbidities) were recorded. Socioeconomic status was noted using the modified Kuppuswamy scale.[11] The intensity of the pain was measured using the numerical pain rating scale (NPRS) ranging from 0 to 10. Greater the score indicates the greater intensity of pain (0 = no pain, 10 = worst imaginable pain). It has high reliability and validity (Intraclass co-efficient (ICC) = 0.95)[12]. Patients' fear of pain and avoidance of physical activities were assessed using the fear-avoidance beliefs questionnaire (FABQ), a self-report health questionnaire. It consists of two subscales, FABQ-physical activity (PA), and FABQ-work. The reliability of FABQ is 0.98 (ICC = 0.98) and is valid to use.[13] The sample size was calculated using G*Power, Heinrich- Heine Dusseldorf, Germany. Dynamic balance was assessed using the Minibest test, a 14-item performance test with a total score of 28 points. It comprises four subscales anticipatory postural adjustments, reactive postural control, sensory orientation, and dynamic gait. It has reliability of 0.98 and 0.96, respectively, and high content validity[14]. Functional performance was assessed using a battery test called the Back Performance Scale (BPS) to evaluate activity limitation. It is a 16-point scale ranging from 0 to 15. The

Statistical analysis: The data was analyzed using (IBM SPSS Chicago, IL, USA) (Statistical Package for the Social Sciences) software version 24. The normality testing was done using the Kolmogorov–Smirnov test which showed that the data were not distributed normally. Hence, the nonparametric Spearman correlation test was used to evaluate the correlation between the variables. P <0.05 was considered statistically significant performance of each component is assessed using a 4-point ordinal scale. It has reliability of 0.98 (ICC = 0.98) and good validity.[15] Roland–Morris Disability Questionnaire was used to assess the disability which helps to evaluate the difficulty to perform physical activity and is a self-administered measure. It is a measure of disability where greater levels of disability are reflected by higher numbers on a 24-point scale.

Results

A total of 75 participants of age 41–59 years were recruited in the study wherein the majoritywas females (74.3%) Table 1. The median andinterquartile range for age, NPRS, RMDQ, FABQ-total score, FABQ-PA, FABQ-W, Minibest test, and BPS is represented in Table 2. There was a low positive correlation of FABQ total score with pain (r = 0.432, P = 0.000),functional performance (r = 0.483, P = 0.000), and low negati ve correlation with dynamic balance (r = −0.424, P = 0.000). The FABQ-totalscore showed a moderate positive correlation withdisability (r = 0.537, P = 0.000) in chronic Pelvic Girdle pain patients Table 3 .Further analysis revealed that there was a moderate correlation of FABQ-PA with pain (r =0.538, P = 0.000), dynamic balance (r = −0.514, P = 0.000), disability (r = 0.574, P = 0.000), and low correlation with functional performance (r = 0.495, P = 0.000). A low correlation of FABQ-W with functional performance (r = 0.413, P = 0.000) and disability (r = 0.442, P = 0.000) was observed Table 3.

Discussion

The results of the present study revealed a positive correlation of FABQ with pain and functional performance and a negative correlationwith dynamic balance. Nava– Bringa Pelvic Girdle s *et al*. in their study stated that there is astrong positive relationship between pain severity and high beliefs score and functional disability in chronic pain patients[17]. A similar cross-sectional study by Lee and Park reported that there was a significant correlation between the measures of physical capacity and FABQ-W and in addition, they reported an increase in pain is related to higher scores on the FABQ-P, thus leading to less activity, which further contributed to the severity of pain.[18] A study done in 2020 by Salama *et al*. aimed to determine the predictors of beliefs, pain, and disability indices in chronic Pelvic Girdle pain In Pelvic Girdle pain patients, the equilibrium of patients. They reported a strong correlation between FABQ-total score, pain (r = 0.52, P < 0.01) and disability (r = 0.70, P < 0.01) and stated that the patients a high level of fear of movement are more likely to have intense pain

and disability[19]. Thus, causing delayed contraction of trunk muscles, resulting in reduced stiffness of the spineat the time of initiation of movement and giving rise to instability another study reported that during quiet standing postural sway decreases because of trunk stiffening strategy or ankle strategyand postural stability decreases during standing on foam in chronic Pelvic Girdle pain patients when compared to healthy individuals.[21] *ET al*. in 2015 reported that the subjects with low back pain (LBP) had increased sway pattern when compared to healthy individuals. When balance is challenged, the Pelvic Girdle pain patients use more contraction and less cognitive control compared to healthy individuals[22]. In the current study, a moderate correlation was found between fear avoidance beliefs and BPS. A study by Panhale *et al*. in 2017 reported a significant association between elevated beliefs questionnaire (FABQ) and activity limitation BPS in patients with chronic Pelvic Girdle pain. It was observed that the performance was specifically affected in roll-up, fingertip to floor, and lift test[10]. This observed functional limitation could be because of fear of provoking pain during activity which may affect components of motor processing thus inhibiting the muscle activity[23]. Another study from 2013 reported that the level of performance shown by elders with Pelvic Girdle pain was worse than elders without low back pain, especially in the sock test and the pickup test ($P < 0.05$)[24] reason for impairment observed in pickup test and elevated pain could be because of over activation of trunk muscles while performing the activity as there is an abnormal adaptation of these muscles to guard limbs Furthermore, the present study revealed that avoidance behavior leads to limitation of functional performance resulting in disability in chronic Pelvic Girdle pain patients. Crombez *et al*. reported that a moderately significant relation was found between physical and work fear-avoidance behavior and disability[25]. Fear related to pain is associated with the impairment of physical performance and has been reported to increase self-reported disability[26,27]. The study had certain limitations such as small sample size. Furthermore, the study has been conducted in chronic low back pain patients and the findings cannot be generalized for patients the spine is disturbed by rapid movements of the upper or lower with acute low back pain. In the future, studies can be conducted in larger sample size to obtain results that can be generalized to the whole population. Furthermore, correlation can be studied in other lumbar spine conditions.

Table 1: Demographic characteristics of participants

Variables	Frequency (%)
Gender	
Female	56(73.4)
Male	19(26.6)
Marital	1.6
Status Education	
Primary	18 (24.0)
Secondary	22 (29.3)
Graduate	26 (36.0)
Postgraduate	2 (1.3)
Unemployed	28 (37.3)
Employed	46 (61.3)
On leave	1 (1.3)
Socioeconomic status	2 (2.7)
Upper middle	28 (37.3)
Lower middle	11 (14.7)
Upper lower	34 (45.3)

Table 2: Descriptive analysis of variables in pelvic girdle pain patients (n=75)

Variable	Median	IQR
Age	48	41–59
NPRS	6	5–8
FABQ-PA	19	18–24
FABQ-W	33	29–39
FABQ - total	54	45–63
RMDQ	15	12–22
Minibest test score	20	16-20
BPS		

NPRS: Numerical Pain Rating Scale, RMDQ: Roland–Morris Disability Questionnaire, FABQ-PA: Fear-avoidance Beliefs Questionnaire - physical activity, FABQ-W: Fear-avoidance Beliefs

Questionnaire work, FABQ-total: Fear-avoidance Beliefs Questionnaire total, IQR: Interquartile range, BPS: Back Performance Scale.

Table 3: Correlation of Fear-avoidance Beliefs Questionnaire, Beliefs Questionnaire - work and Beliefs Questionnaire total with Numerical Pain Rating Scale, MiniBest test, Back Performance Scale, and Roland–Morris Disability Questionnaire using Spearman's correlation test

Variable	FABQ-PA		FABQ-W		FABQ-total	
	R.	P	R	P	R	P
NPRS	0.538	0.00	0.319	0.005	0.431	0.00
Minibest test score	-0.515	0.00	0.322	0.005	-0.425	0.00
Back performance test	0.495	0.00	0.411	0.00	0.482	0.00
RMDQ	0.576	0.00	0.444	0.00	0.538	0.00

*Level of significance P≤0.05, r: Spearman correlation coefficient.

NPRS: Numerical Pain Rating Scale, RMDQ: Roland–Morris Disability

Questionnaire, FABQ-PA: Beliefs Questionnaire - physical activity,

FABQ-W: Beliefs Questionnaire work,

FABQ-total: Beliefs Questionnaire

Conclusions

This study concludes that beliefs are significantly associated with pain, dynamic balance, functional performance, and disability in chronic Pelvic Girdle pain patients. A multidisciplinary approach is required to plan individualized rehabilitation program for these patients.

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