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Pilot Study of Pelvic Girdle Pain in Women with and Without Laparoscopically Diagnosed Endometriosis

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Abstract

Objective: Pelvic girdle pain is a well recognized cause of back pain in the pregnant and postpartum population. In this pilot study, we explore whether pelvic girdle pain is also involved in the etiology of back pain outside the pregnant/postpartum period, in women with or without laparoscopically diagnosed endometriosis.

Methods: Retrospective review of new patients seen for pelvic pain from June – December 2012 at a tertiary referral centre. Patients self-rated back pain severity from 0-10. Pelvic girdle pain tests were sacroiliac dorsal ligament tenderness, right or left active straight leg raise, and right or left Faber tests. The examiner was blinded to the back pain severity. Pelvic girdle pain was tested for an association with the severity of back pain. Endometriosis was diagnosed on laparoscopy, and the presence or absence of endometriosis was also considered.

Results: Sixty-three women with pelvic pain met the study criteria, with 82% having underlying endometriosis (32/39). Pelvic girdle pain (presence of at least one positive pelvic girdle pain test) was significantly associated with greater severity of back pain (5.6 +/- 2.9 vs. 3.5 +/- 2.9, Mann-Whitney test, p=0.009). Furthermore, the number of positive pelvic girdle pain tests was significantly associated with the severity of back pain (Spearman rho=0.30, p=0.016; linear regression b=0.53, p=0.031). Pelvic girdle pain was similarly present in women with or without endometriosis (63% (20/32) vs. 86% (6/7), Fisher Exact test, p=0.39). No other demographic variables, diagnoses, symptoms, or signs, were associated with severity of back pain.

Conclusion: This pilot study provides initial evidence that pelvic girdle pain is involved in the etiology of back pain in the pelvic pain population, similar to the pregnant/postpartum population, in women with or without endometriosis at laparoscopy.

Introduction

Pelvic girdle pain affects one in five pregnant women, and may persist > 6 months postpartum in 3-30% [1,2]. Pelvic girdle pain has been defined as pain between the posterior iliac crest and gluteal fold that includes the sacroiliac joint [2]. Pathophysiology of pelvic girdle pain in pregnancy is multifactorial and includes hormonal and biomechanical factors such as higher levels of progesterone and relaxin and instability of the pelvic girdle [2-4].

Tests for pelvic girdle pain include the tenderness on palpation of the sacroiliac long dorsal ligaments, pain with active straight leg raise or Faber test, positive posterior pelvic pain provocation test, Gaenslen's test, Trendelenburg's test, and a tender symphysis [2]. Interobserver reliability for each pelvic girdle pain test ranges from a kappa of 0.34 to 0.67, while the diagnosis of pelvic girdle pain as a whole has a kappa of 0.63-0.74 [2].

Although pelvic girdle pain is well recognized in the pregnant/postpartum population, its role in other populations is less understood [2]. Tu et al. recently reported that posterior provocation was more common in non-pregnant/postpartum women with pelvic pain compared to controls (37% vs. 5%) [5]. Similarly, in our clinical experience, we have observed that pelvic girdle pain is common in non-pregnant/postpartum women with pelvic pain often related to endometriosis. Endometriosis is the presence of uterine endometrium outside of the uterus elsewhere in the pelvis, which is diagnosed by laparoscopy and affects 10% of reproductive-aged women, and is a common cause of chronic pelvic pain and infertility [6].

The objective of this pilot study was to explore whether pelvic girdle pain contributes to back pain in the pelvic pain population outside of the pregnant/postpartum state, and whether there is any relation to the presence of endometriosis on laparoscopy.

Methods

This study was approved by the research ethics boards of the University of British Columbia and BC Women's and Children's Hospitals (H12-01802 and H13-01325). The setting is at the BC Women's Centre for Pelvic Pain and Endometriosis, the tertiary referral centre for the province of British Columbia as previously described [6]. Beginning in June 2012, after being trained by a specialist in pelvic physiotherapy (SB), the primary author (PY) began performing the pelvic girdle pain tests at new pelvic pain patient visits. The research ethics boards gave us approval to retrospectively review these cases from June – December 2012 with a waiver of informed consent. The research ethics boards determined that cases after December 2012 could not be reviewed

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without contacting patients to obtain consent, and so these cases were not included in this chart review.

Therefore, this is a retrospective pilot study to investigate the role of pelvic girdle pain in the non-pregnant/postpartum pelvic pain population, prior to embarking on a larger prospective study. Inclusion criteria were performance of pelvic girdle pain tests and completion of a pre-visit questionnaire where the patient self-rated back pain severity from 0-10 (0=no pain, 10=worst pain). Exclusion criteria were known history of sciatica, rheumatological condition, or osteoarthritis of the back.

Five pelvic girdle pain tests were performed in each patient: palpation of the sacroiliac long dorsal ligaments, right and left active straight leg raise, and right and left Faber test. Palpation of the sacroiliac long dorsal ligaments was done with the patient sitting, through direct palpation of the ligaments at the sacrum, and the patient was asked if tenderness was present. Active straight leg raise to 30 degrees was done by the patient with the patient lying supine, while Faber test was peformed by placing one ankle at the opposite knee (i.e. flexing the knee, and externally rotating and abducting the ipsilateral hip). For these latter two tests, the patient was asked whether pain was provoked at the back, hip, or pelvis. Palpation of the sacroiliac dorsal ligaments and the Faber test are provocation tests of the sacroiliac joint, while the active straight leg raise tests pelvic girdle function [2].

The outcome variable was severity of back pain (0–10) self-rated by each patient on an entry questionnaire before the first appointment. The explanatory variable was pelvic girdle pain. The examiner performing the pelvic girdle pain tests was blind to the severity of back pain.

Pelvic girdle pain was initially coded as a binary variable (present/absent): pelvic girdle pain was present if at least one pelvic girdle pain test was positive, and negative if all tests were negative. We then tested for an association between pelvic girdle pain (present/absent) and severity of back pain (0-10) (Mann-Whitney test due to non-normality). Next, the severity of back pain (0-10) was tested for an association with the number of positive pelvic girdle pain tests (0–5), using correlation testing (Spearman rank correlation due to non-normality) and linear regression (after ensuring linear regression assumptions were met).

In addition, we determined whether pelvic girdle pain was associated with endometriosis. Endometriosis was defined as laparoscopic diagnosis with or without histological confirmation, as recommended by a recent consensus statement for endometriosis research [7]. Histological confirmation was not a mandatory part of the definition, because although full excision and histological confirmation are standard of care at our Centre, excision or biopsy is very rarely performed in the community. Thus, many patients are referred with laparoscopically diagnosed endometriosis but without histological confirmation, and although we may repeat laparoscopy in a subset to fully excise and histologically confirm endometriosis, in many cases surgery is not repeated at our Centre if not clinically indicated.

We also tested whether severity of back pain was associated with other variables on chart review (Spearman rank correlation test or Mann-Whitney test), including demographic factors (e.g. age, parity, BMI, history of trauma to the pelvis), diagnosis of endometriosis, patient symptoms (e.g. dysmenorrhea, chronic pelvic pain, deep dyspareunia, superficial dyspareunia, bowel symptoms such as diarrhea and/or constipation, bladder symptoms such as frequency and urgency), and physical exam (e.g. positive Carnett's test, bladder base tenderness, and pelvic floor tenderness).

For symptoms, dysmenorrhea was defined as menstrual cramps. Chronic pelvic pain was defined as any other non-dysmenorrhea pelvic pain, which can be right, left or central, and can be daily or intermittent with or without cyclical exacerbation, for > 3-6 months. On abdominal exam, abdominal wall pain was present if Carnett test [8] was positive: i.e. abdominal tenderness the same or worse with abdominal wall contraction. On pelvic exam, in addition to endovaginal ultrasound palpation of the structures implicated in endometriosis (e.g pouch of Douglas and uterosacral ligaments) which we use to decide whether to perform laparoscopy [9], we also recorded whether the bladder base (anterior vaginal wall) and pelvic floor (levator ani) were tender. It should be noted that X-ray imaging of the spine was not routinely performed, as it is low yield in young healthy women as in our population [2].

Table 1: Absence of association between other variables and back pain severity.

Variable	Present	N	Back pain severity (0 – 10)	p-value[a]
Demographics				
Age	-	-	Spearman's rho = - 0.01	0.95
BMI	-	-	Spearman's rho = 0.23	0.07
Parous	Yes	24	4.8 +/- 3.1	0.82
	No	38	4.9 +/- 3.1	
History of trauma to the pelvis	Yes	29	5.4 +/- 2.9	0.17
	No	32	4.4 +/- 3.1	
Endometriosis				
Laparoscopically diagnosed	Yes	32	5.2 +/- 3.2	0.46
	No	7	4.3 +/- 3.4	
Symptoms				
Dysmenorrhea	Yes	53	4.8 +/- 3.2	0.72
	No	6	5.6 +/- 2.4	
Non-dysmenorrhea chronic pelvic pain	Yes	56	5.1 +/- 3.0	0.64
	No	4	4.0 +/- 4.2	
Superficial dyspareunia	Yes	31	5.1 +/- 3.2	0.70
	No	17	4.7 +/- 3.1	
Deep dyspareunia	Yes	44	5.3 +/- 3.3	0.25
	No	8	4.1 +/- 1.7	
Bowel symptoms	Yes	46	5.4 +/- 3.0	0.07
	No	17	3.7 +/- 3.0	
Bladder symptoms	Yes	43	5.2 +/- 3.0	0.44
	No	20	4.4 +/- 3.2	
Signs				
Abdominal wall pain	Yes	50	4.8 +/- 3.0	0.60
	No	12	5.3 +/- 3.4	
Bladder base tenderness	Yes	26	4.7 +/- 2.5	0.42
	No	35	5.1 +/- 3.3	
Pelvic floor tenderness	Yes	33	4.9 +/- 2.7	0.71
	No	28	5.0 +/- 3.4	

[a]All associations tested with the Mann-Whitney test, except for Spearman rank correlation for age and BMI.

The research ethics boards also gave a waiver of informed consent in order to retrospectively review a small series of control non-pain gynecology patients also seen by the same single care provider for a new patient consultation from June – December 2012, in which the pelvic girdle pain tests were also routinely performed. This control population was referred for abnormal bleeding, infertility, and other non-pain indications. The prevalance of pelvic girdle pain was compared between these non-pain patients and the pelvic pain sample (Fisher Exact test).

Signficance was $p<0.05$ (2-tailed), means +/- one standard deviation, odds ratios with 95% confidence intervals, and all statistics performed with SPSS 21.0 [10]. Missing data were excluded pairwise (Table 1).

Results

Sixty eight cases met the inclusion criteria, and after exclusion for known history of sciatica (n=1), underlying rhematologic condition (e.g. Rheumatoid arthritis or Lupus) (n=3), and osteoarthritis of the back (n=1), there were 63 cases that were included in the study and analyzed. The average age was 33.6 +/- 9.1, average BMI was 25.9 +/- 6.9, 39% were parous (24/62), and 82% of cases had laparoscopically diagnosed endometriosis (32/39).

For the outcome variable, the average severity of back pain was 4.9 +/- 3.1 (range: 0-10, n=63).

For the explanatory variable, pelvic girdle pain (at least one positive pelvic girdle pain test) was present in 67% (42/63) of cases.

Five positive pelvic girdle pain tests were present in 6% (4/63), four positive tests in 10% (6/63), three positive tests in 11% (7/63), two positive tests in 22% (14/63), one positive test in 18% (11/63), and all tests were negative in 33% (21/63). For each specific pelvic girdle pain test, sacroiliac dorsal ligament tenderness was present in 37% (23/63), right active straight leg raise in 27% (17/63), left active straight leg raise in 25% (16/63), right Faber test in 38% (24/63), and left Faber test in 38% (24/63).

In women with pelvic girdle pain (presence of at least one positive test), the mean severity of back pain was 5.6 +/- 2.9, compared to a mean severity of 3.5 +/- 2.9 in women without pelvic girdle pain (all tests negative) (Mann-Whitney test, n=63, p=0.009). In addition, the number of positive pelvic girdle pain tests (0–5) was positively correlated with the severity of back pain (0–10) (Spearman's rho=0.30, n=63, p=0.016). The linear regression was also significant with the explanatory variable (number of positive pelvic girdle pain tests) having a coefficient of 0.53 (95% CI=0.05–1.01, p=0.031), which represents the increase in back pain severity for each additional positive pelvic girdle pain test.

Pelvic girdle pain was similarly present in women with endometriosis 63% (20/32) and without endometriosis 86% (6/7) at the time of laparoscopy (Fisher Exact test, p=0.39).

None of the other variables were associated with severity of back pain (Table 1).

Pelvic girdle pain testing was also performed on a small series of control non-pain gynecology patients (n=13). Pelvic girdle pain was present in 15% (2/13), which was significantly lower than in the pelvic pain sample (67%; 42/63) (OR=11.0, 95% CI 2.23-54.2, Fisher Exact test, p<0.001).

Discussion

This retrospective pilot study provides initial evidence that pelvic girdle pain is involved in the etiology of back pain in the pelvic pain population (most (82%) related to underlying endometriosis), similar to its known role in the pregnant/postpartum population. First, there was a significant association between the presence of pelvic girdle pain and severity of back pain. Second, the number of positive pelvic girdle pain tests was also significantly associated with severity of back pain; that is, the greater the pelvic girdle dysfunction, the more severe the back pain. Third, there was no evidence of association between severity of back pain and any other variable, indicating the specificity of the relationship between pelvic girdle pain and back pain.

We also found that pelvic girdle pain was similarly present in women with or without laparoscopically diagnosed endometriosis. Therefore, pelvic girdle pain should be considered as an etiological factor for back pain in women, whether or not the patient has underlying endometriosis. In other words, the presence of one visceral source of pain (endometriosis), does not preclude the co-existence of another somatic source of pain (pelvic girdle pain).

Weaknesses of the pilot study include its retrospective nature and small sample size. Also, each patient was examined by only a single physician. However, the physician was blinded to the back severity scores. In addition, based on the feasibility shown in this pilot study, we have initiated a larger prospective study of pelvic girdle pain in our patient population that began January 2014. Another weakness is that the Spearman's rho was only 0.30, which indicates there are variables other than pelvic girdle pain that are also contributing to the severity of back pain. However, even if other variables are involved, it is evident that pelvic girdle pain is one of the statistically significant factors that contributes to back pain in the pelvic pain population. Furthermore, the study was done in a tertiary referral center, which may limit generalizability to the primary care setting.

The etiology of pelvic girdle pain in the pelvic pain population may be due to several factors. In the pregnant/postpartum population, risk factors include history of back pain, arthritis, and trauma to the pelvis [2], which could also be involved in the non-pregnant/postpartum pelvic pain population. Another factor may be concurrent mechanical dysfunction in pelvic pain patients. For example, the pelvic floor musculature is involved in force closure of the pelvis, and loss of motor control of the pelvic floor in women with pelvic pain may be a factor in some cases of pelvic girdle pain [11]. In addition, it has been postulated that nervous system sensitization could lead to pelvic girdle pain in non-pregnant/postpartum populations [11]. Central sensitization causes a general sensitivity to pain in multiple body regions (e.g. the pelvic girdle), which occurs through an increased excitability of spinal pathways and decreased inhibition from the brain [12-14].

The association between pelvic girdle pain and back pain suggests that adequate treatment of back pain in the non-pregnant/postpartum pelvic pain population may require specific treatment of the pelvic girdle, whether or not the patient has underlying endometriosis. Physiotherapy is the main modality of treatment. At our Centre, we utilize an approach that includes manual therapy, a home exercise program, and education about body mechanics, all of which focus on reducing fear of movement, restoring sacroiliac and hip symmetry, and improving motor patterns and pelvic girdle stability [15]. Emphasis is placed on self-efficacy and self-management. In addition to physiotherapy, a psychological approach to reduce central sensitization may also be employed, which includes cognitive behavioural therapy and mindfulness meditation [1]. A randomized trial demonstrated the effectiveness of a multidisciplinary approach for chronic pelvic pain, compared to standard gynecologic treatment [16].

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