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Psychological Factors in Chronic Pelvic Pain due to Endometriosis: A Comparative Study

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Key Words
Chronic pelvic pain · Endometriosis · Psychological factors · Disability

Abstract
Background/Aims: This study compared women suffering chronic pelvic pain (CPP) secondary to endometriosis (n = 30) with women experiencing CPP due to either myofascial abdominal/pelvic pain (n = 70) or pelvic adhesions (n = 38) to determine if there are specific psychological variables uniquely associated with endometriosis. ***Methods:*** This is a cross-sectional study of 138 women drawn from a convenience sample of 192 consecutive women with CPP presenting for evaluation to a university hospital chronic pain clinic. Subjects were categorized into groups based on their CPP diagnosis. Each subject completed a battery of validated inventories assessing demographic status, pain experience and other pain-related symptoms, pain disability, frequency of depressive symptoms, level of affective distress, satisfaction with pain treatment and satisfaction with their marital relationship. ***Results:*** No differences were obtained across the three groups for any of the outcome measures. Effect size computation supported the absence of clinical differences across the groups for these measures. ***Conclusion:*** These findings fail to support the presence of a unique psychological profile or disproportionate psychological disturbance for women with CPP due to endometriosis. These data illustrate the importance of considering control groups that include chronic pain when exploring psychological contributions to specific chronic pain conditions.

Introduction

The relation between endometriosis and pain has been a subject of longstanding controversy. The variable association of evidence for endometriosis with chronic pelvic pain (CPP) [1] and the frequent presence of comorbid psychosocial disturbance in these patients [2] have led to speculation that psychological factors play a primary role in understanding the pain associated with endometriosis [2–4]. These studies echo sentiments that reflect a deeply held view for many clinicians for the primary influence of psychological distress to the etiology of CPP [5, 6]. Not surprisingly, 70% of women diagnosed with endometriosis report that at least one physician had informed them that their pain symptoms were primarily due to psychological disturbance [7].

Methodologically rigorous investigations examining the relationship between psychological variables and endometriosis-related pain are lacking [2], with most previous studies being either qualitative accounts of the impact of endometriosis [6, 7] or clinical anecdotal reports [8, 9]. When control groups are included in these studies, it is

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typical for these women to be compared with gynecologic patients who do not suffer chronic pain [10, 11]. Given the known impact of chronic pain on psychological functioning [12, 13], it is important to demonstrate a prevalence of psychological disturbance for women with endometriosis-related pain beyond that present in persons with chronic pain in general in order to establish a specific and causal role for psychological factors in explaining the pain experience of women with endometriosis.

This study compared women with pain due to endometriosis with two other CPP groups, those with myofascial abdominal/pelvic pain and pelvic adhesive disease, to further investigate whether there is a specific or more severe psychological profile associated with CPP related to endometriosis. This study will utilize standardized measures of pain, disability and psychological functioning to assess differences between these groups on the selected psychological outcome variables. In addition, given the known contribution of psychological disturbance to the severity of pain morbidity [14], the study will also examine an array of pain-related factors to determine if women with CPP due to endometriosis present with more severe pain symptoms. Comparatively greater pain morbidity for the endometriosis group might suggest the influence of a higher level of psychological dysfunction for these subjects.

Subjects and Methods

Subjects

Subjects were a convenience sample drawn from a pool of 192 consecutive women seen for evaluation in a multidisciplinary chronic pelvic pain clinic at a university hospital. The mean age of the sample was 32.1 years (SD 9.5) with an average duration of pain of 51.1 months (SD 57.8). 56% were married, 26% were single (never married) and 10% were divorced. 16% of the subjects had not completed high school, 25% were high school graduates, 37% had attained some college or technical training, 16% had obtained a college degree, and 6% had a graduate level degree.

Procedure

Subjects were evaluated by a gynecologist, pain psychologist, and a physical therapist specialized in chronic pain intervention. Patients underwent a comprehensive medical and psychological evaluation including review of available medical data and surgical reports, clinical interview including psychological assessment, pelvic examination and, when indicated, physical therapy assessment. Clinical diagnoses were based on these data as well as symptom presentation, case history and clinical course of the patient's pain.

Groups

For this study, three pelvic pain conditions were identified: endometriosis (n = 30), myofascial abdominal/pelvic pain syndromes (n = 70), and pelvic adhesions (n = 38). Diagnostic confirmation rested heavily on the presence or absence of laparoscopic findings available for all subjects in addition to symptom presentation, physical examination and clinical history. For the endometriosis and pelvic adhesion subjects, diagnosis was based on positive laparoscopic evidence and, in general, a history of benefit from standard interventions for endometriosis or pelvic adhesions (e.g. surgery, hormonal manipulation) and the laparoscopic evidence for the recurrence of endometriosis or adhesions with the re-onset or worsening of CPP. Patients with adhesive disease had a history for gynecologic disorders known to promote adhesions, including past surgery, endometriosis, and pelvic inflammatory disease.

For the myofascial pain patients, diagnostic criteria followed those described by Travell and Simons [15] including the presence of restricted range of motion, muscle hypertonicity and evidence for myofascial trigger points that gave rise to associated referred pain sites that reproduced the patient's primary pain complaint and are consistent with known referred pain patterns as detailed in Travell and Simons [15]. A careful and specific physiotherapeutic examination rested on detailed palpation of relevant muscle groups, such as the internal and external obliques, rectus abdominis, transverses abdominis, piriformis and levator ani, for the presence of muscle hypertonicity or spasm and symptomatic trigger points commonly associated with abdominal and pelvic pain [16].

Measures

Prior to the medical assessment, all subjects completed the following battery of questionnaires assessing pain experience and symptoms, mood, demographic status and medical history, and functional disability attributed to pain.

Chronic Pain Questionnaire (CPQ – available from the corresponding author upon request). Developed for routine clinical use in the clinic, the CPQ is an open-ended questionnaire that solicits a wide range of information that includes demographic and socioeconomic status, a history of symptom course and previous pain interventions related to chronic pain, employment status, and an array of pain-related symptoms. In addition to demographic variables, for this study several pain-related variables were included in the analysis. Subjects were asked to rate the intensity of their pain on a 0–6 scale (0 = 'no pain' to 6 = 'excruciating pain'). Pain duration was quantified by the number of months since the onset of CPP. Subjects were also asked to rate their perceived control over pain (0 = 'complete control' to 6 = 'no control'), the degree to which they suffer due to pain (0 = 'no suffering' to 6 = 'very severe suffering'), and the level of their marital relationship satisfaction (0 = 'very satisfied' to 6 = 'major and persistent problems'). To assess satisfaction with pain treatment, subjects were asked 'How would you rate your overall satisfaction with the care and treatment that you have received for your pain to date?' (0 = 'very satisfied' to 5 = 'very dissatisfied').

Depressive Symptoms. To assess severity of depressive symptoms, the Beck Depression Inventory (BDI) [17] was administered. The BDI is a 21-item self-report measure that assesses both vegetative and cognitive/affective dimensions of depression. It has a strong history of adequate discriminant validity and reliability with α coefficients for the BDI in psychiatric and nonpsychiatric populations ranging from 0.73 to 0.95 [18].

General Affective Distress. To assess affective distress, all subjects completed the Brief Symptom Inventory (BSI) [19]. The BSI is a self-administered questionnaire that asks subjects to rate their

degree of psychological distress over the previous week. The BSI provides a global measure of affective distress, called the Global Severity Index (GSI). Higher scores indicate more severe psychological distress. Studies of the BSI have documented its psychometric integrity [19].

Pain Experience. The McGill Pain Questionnaire (MPQ) [20] was administered to assess pain experience. The MPQ is the most widely used measure of pain experience, and has good psychometric reliability and validity [21]. Repeat administration of the MPQ has revealed a 70.3% rate of consistency in the PRI score [20].

Pain Disability. To assess disability attributed to pain, subjects completed the Pain Disability Index (PDI) [22]. The PDI is a 7-item self-report measure that quantifies the degree that pain interferes with various functional activities. Ratings of disability for each functional area are quantified along a 10-point scale from 'no disability' to 'total disability'. For this study, the total PDI score, an average of all the individual item responses, was used as a measure of pain disability. Test-retest reliability for the total score is moderately high and some of the subscales significantly correlate with observed pain behavior [22, 23].

This study was approved by the University of Michigan Institutional Review Board. As the data for this study were obtained during the course of routine clinical assessment and intervention, the requirement for informed consent was waived by the Institutional Review Board.

Effect Size Computation

Power for the statistical analyses were based on Cohen's [24] guidelines for a small (f = 0.10), medium (f = 0.25) and large (f = 0.40) effect size in behavioral science research. Given the absence of prior data for establishing a clinically meaningful comparison relevant to the design for this study, a large effect size was targeted. For a three-group comparison at this effect size, with $\alpha = 0.05$ and 0.90 power, the study design requires a minimum of 27 subjects per group.

Statistical Analysis

To determine differences between the groups of subjects diagnosed with endometriosis, myofascial pain and pain secondary to adhesions, χ^2 analyses were used to assess differences on the categorical demographic variable of marital status and educational achievement. A series of analysis of variance (ANOVAs) were computed to examine differences in demographic status across the groups for age and duration of pain and the pain-related variables assessed by the CPQ (pain intensity, pain suffering, perceived control over pain, satisfaction with pain intervention). ANOVAs were also computed to assess differences between the groups on the main dependent variables of depressive symptoms (BDI), global affective distress (BSI-GSI), severity of pain experience (MPQ), and pain disability (PDI).

Results

Between-Group Analyses for Demographic Data and Duration of Pain

There were no differences between the groups for demographic variables and duration of pain. One-way ANOVAs indicated no differences for age (p = 0.31) or duration of pain (p = 0.44). χ^2 analysis revealed no differences across groups for the categorical variables of level of education ($\chi^2 = 12.16$, p = 0.14) and marital status ($\chi^2 = 12.52$, p = 0.57).

Between-Group Analyses for Depression, Affective Distress, Pain Experience, Pain-Related Disability and Pain-Related Questionnaire Variables

One-way ANOVAs across the pelvic pain groups indicated no significant differences for the BDI (p = 0.68), BSI-GSI (p = 0.79), MPQ factors for sensory (p = 0.78), affective (p = 0.16), evaluative (p = 0.45) and total (p = 0.64) pain ratings, and the PDI (p = 0.73). Furthermore, analysis of individual items from the CPQ revealed no differences across the groups for measures of numerical rating of pain severity (p = 0.51), perceived pain-related suffering (p = 0.72), perceived control of pain (p = 0.26), and satisfaction with pain treatment (p = 0.57). Examination of selected mean scores for the endometriosis group further suggests the report of only moderate levels of psychological disturbance. For example, the BSI-GSI mean score of 0.84 places these subjects midway between normal control subjects (GSI mean of 0.30) and psychiatric outpatients (GSI mean of 1.32) based on available norms [19]. Their BDI mean score of 15 places them well below the cut-off threshold of 21 for major depression among a chronic pain population [25]. The mean PDI score for the endometriosis group would categorize them as 'low' disabled based on one study [23].

Discussion

In the present study, we found no differences in the severity of depressive symptoms, degree of affective distress, perceived marital dissatisfaction or for multiple measures of pain-related comorbidity (e.g. pain intensity, pain-related disability, perceived control over pain, suffering due to pain, and satisfaction with pain treatment) when comparing women with endometriosis-related pelvic pain and CPP due to musculoskeletal dysfunction or pelvic adhesive disease. These findings suggest that women with endometriosis-related pain do not exhibit comparative psychological disturbance or maladaptive pain coping that would encourage speculation for a psychogenic explanation for their pain. Our data are in general agreement with previous studies that have compared women with CPP due to endometriosis with chronic pain control groups [26, 27] or qualitatively examined the ex-

perience of women with pain attributed to endometriosis [28, 29]. Taken together, these data support the view that women with pain secondary to endometriosis appear, in general, psychologically unremarkable compared to other subgroups of women with chronic pain and that the psychological problems they exhibit are more than likely due to the suffering inherent in living with chronic pain and its related disability. These findings illustrate the importance of chronic pain control subjects for research examining the potential influence of psychological disturbance in the onset and maintenance of persistent pain syndromes [14].

The absence of a differential and adverse psychological profile for women with endometriosis is important as it challenges previous contention that psychological factors play a prominent role in contributing to the onset or clinical significance of pain secondary to endometriosis. Supportive data for the view that psychological factors are not causal to endometriosis comes from studies that document clinically significant reductions or the resolution of endometriosis-related pain when endometriosis is effectively treated [30, 31]. For the pain clinician, a clinical inference of psychogenesis for a presenting pain complaint rests, in part, on the clinician's assumption of the prevalence rate of psychogenic pain for his or her clinical pain population, such as with endometriosis. Our data suggest that women with endometriosis-related pain do not differ from other women with CPP in the severity of their pain, emotional distress, perceived disability, or clinical presentation associated with pain morbidity. While these findings do not rule out a causal relation between psychological factors and endometriosis pain for some patients, it does not support in general a comparatively troubled psychological profile or particular psychological disturbance for women with pain related to endometriosis.

These data do not minimize the central importance of assessing psychological functioning in women with CPP with endometriosis. Chronic pain and its related clinical morbidity are highly influenced by cognitive and affective factors [14, 32] and psychiatric syndromes such as depression and anxiety disorders [33]. Furthermore, pain researchers have identified a number of pain beliefs and cognitive coping variables that bear a strong relation to how pain patients interpret their pain experience, allow pain to foster functional disability, and employ strategies by which to cope with their pain [32, 34]. Determining the relation of psychological disturbance to pain expression among women with CPP can be a daunting challenge. To meet this challenge, clinicians are encouraged to adopt a biopsychosocial model [35] that considers pain experience as a complex interplay of biological, psychological and social variables that mutually and interactively contribute to pain experience.

This study has several methodological constraints. The sample size for the endometriosis and adhesion CPP groups was relatively small. While our selected effect size analysis ($f = 0.40$) did not support the presence of clinically significant differences between the groups, it is possible that the comparisons lacked sufficient power to ascertain such differences. For example, a moderate effect size ($f = 0.25$) taking α of 0.05 and power of 0.80 would require 52 subjects per group [24]. In addition, the sample derives from a tertiary care setting, and thus the sample is likely to present with more severe psychological disturbance when compared to a community healthcare setting [36], thus limiting the generalizability of the findings. A third sample concern involves the relatively high proportion of CPP patients with myofascial abdominal/pelvic pain as their primary pain disorder. This may be a diagnostic distribution somewhat at variance with the experience of many pelvic pain clinicians and clinics. It should be noted that the myofascial pain group derives from a larger sample ($n = 192$) of women with CPP evaluated in the clinic. Previous studies suggest that approximately 20% of women presenting to a CPP service have musculoskeletal dysfunction contributing to their CPP [37].

A further methodological limitation involves the assessment of subjects with endometriosis. We did not quantify the degree of endometriosis present among our sample of women with pain and endometriosis. Thus, we are unable to compare the extent and severity of endometriosis with various psychological parameters associated with the presenting pain complaint. Quantification of severity of endometriosis may have provided added information on the relation of endometriosis pain and psychological disturbance amongst our sample. In addition, given its cross-sectional design, the relations between the independent and outcome variables are correlational. As a result, this study design is limited in its ability to determine a causal relation between a particular psychological variable and the pain outcome measures. Future studies that examine potential causal relations between psychological factors and endometriosis-related pain will need to consider a larger sample of patients, and utilize a prospective, longitudinal design that assesses, in asymptomatic women, the predictive value of psychological disturbance for the onset and severity of pain secondary to endometriosis later diagnosed.

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