Intermenstrual Pelvic Pain, Quality of Life and Mood

Giovanni Grandi  Anjeza Xholli  Serena Ferrari  Marianna Cannoletta
Annibale Volpe  Angelo Cagnacci

Department of Obstetrics, Gynecology and Pediatrics, Obstetrics and Gynecology Unit, Azienda Ospedaliero Universitaria Policlinico of Modena, Modena, Italy

Introduction

Pelvic pain refers to many different conditions including pain occurring exclusively during menstruation (dysmenorrhea), sexual intercourse (dyspareunia), and in the interval between menses (intermenstrual pelvic pain). When lasting for 6 or more months, the latter defines so-called chronic pelvic pain [1], whose prevalence in women between 18 and 50 years of age is reported to vary from 14.7% in the USA [2], to 21.5–25.4% in Australia [3], the UK [4] and New Zealand [5]. Pelvic pain is often caused by concomitant [6], not always gynecological [7] diseases [5, 8], and is favored by...
predisposing factors [9]. Although pelvic pain can negatively influence quality of life [2, 10–12] and mood [13, 14], the independent role exerted by dysmenorrhea, dyspareunia or intermenstrual pelvic pain has never been clarified and it was thus investigated in the present study.

Materials and Methods

The internal review board approved the study. Women, 16–50 years of age, recruited consecutively at the outpatient department for pelvic pain of our hospital, signed a consent form for the use of sensitive data in research analysis. Inclusion criteria were a regular menstrual cycle and the presence of any type of undiagnosed pelvic pain in the preceding 6 months. Each enrolled woman completed four questionnaires investigating general and gynecological history, intensity of pain, separately for dysmenorrhea, intermenstrual pelvic pain and dyspareunia, quality of life by the SF-36, and depressive symptoms by the Zung Self-Rating Scale for Depression (SDS).

Intermenstrual pelvic pain was previously defined as recurrent or constant pelvic pain, unrelated to menstrual periods, intercourse or pregnancy [4, 5]. Dysmenorrhea was defined as pelvic pain occurring during or shortly before/after menstrual periods. Dyspareunia was defined as deep pelvic pain occurring during sexual intercourse or within the 24 h thereafter. For comparison, three mutually exclusive groups were formed: (1) intermenstrual pelvic pain, with or without dysmenorrhea and dyspareunia; (2) dysmenorrhea, with only menstrual pain, and (3) dyspareunia, with deep pain during intercourse with or without dysmenorrhea, but without intermenstrual pelvic pain.

A 10-cm visual analogue scale (VAS) was used to evaluate pain intensity. The SF-36, the most widely used questionnaire in the field of pelvic pain [15], was used, in a validated Italian version, to quantify health-related quality of life [16]. The SF-36 contains eight domains investigating physical functioning, role-physical limitation, bodily pain, general health, vitality, social functioning, role-emotional limitation, mental health. These domains can be summarized into two general groups: physical component summary and mental component summary. The total item score of the SF-36 ranges from 0 to 100, higher scores indicating a better quality of life.

The SDS, a well-established self-rating measuring scale also in the field of pelvic pain [17], was used to evaluate depressive symptoms. SDS performs similarly to the Beck Depression Inventory, the Hospital Anxiety and Depression Scale and the General Health Questionnaire, with the advantage of being simpler and easier to use [18, 19]. It is composed of 20 items, each with 4 answers ranging between 1 and 4. The total score ranges between 20 and 80, higher scores indicating worst depressive symptoms.

Statistical analysis was performed using the statistical package StatView (version 5.01.98, SAS Institute Inc., Cary, N.C., USA). Comparisons among groups were performed by one-factor analysis of variance (ANOVA), followed when significant by Fisher’s post hoc test. Linear regression analyses were performed between pain intensity and SF-36 or SDS scores (dependent variable). Multiple-regression analyses were used to define which type of pain (intermenstrual, dysmenorrhea or dyspareunia) was independently related to quality of life or depression scores. Analyses were corrected for age, BMI, marital status (single, married or divorced), previous pregnancies (yes/no), wish of pregnancy (yes/no), education (high or low), length of menstrual flow (days). Categorical data were entered as dummy variables. Marital status was entered as two dummy variables (married and divorced vs. single). A single dummy variable was used for education (high: secondary school and graduation versus low: primary school), pregnancies (yes/no) and desire of pregnancy (yes/no).

For all analyses, statistical significance was considered at a two-tailed p value of 0.05. All the results are expressed as means ± standard deviations (SDs).

Results

Among 300 consecutive women, 248 had consistent symptoms that could be included in one of the three mutually exclusive groups. Among these, 231/248 (93.1%) reported dysmenorrhea, 175/248 (70.6%) reported intermenstrual pelvic pain and 146/248 (58.9%) reported dyspareunia. The mean dysmenorrhea VAS score (6.8 ± 2.4) was higher than that for dyspareunia (5.8 ± 2.8; p < 0.003) and intermenstrual pelvic pain (5.5 ± 2.6; p < 0.0001).

175/248 (70.6%) women were included in the group with intermenstrual pelvic pain, 46/248 (18.5%) in the group with dysmenorrhea, and 27/248 (10.9%) in the group with dyspareunia. Among women with intermenstrual pelvic pain, 160 also had dysmenorrhea (160/175, 91.4%), and 119 suffered from dyspareunia (119/175, 68.0%). Among women with dyspareunia, 25 also had dysmenorrhea (25/27, 81.5%). There was no difference in the characteristics of the three groups in terms of age (31.9 ± 7.6 years), BMI (22.45 ± 4.9), education (12.4 ± 3.6 years), number of term pregnancies (0.88 ± 1.28), miscarriages (0.16 ± 0.42), voluntary abortions (0.20 ± 0.61) and flow length (5.03 ± 1.62 days).

Health-Related Quality of Life

The mean SF-36 score was lower in women with intermenstrual pelvic pain (56.8 ± 17.7) than in those with dysmenorrhea (69.2 ± 17.8; p < 0.0001), but not dyspareunia (62.0 ± 18.6; p = 0.15). Similarly, in women with intermenstrual pelvic pain, physical (53.6 ± 19.2) and mental (53.2 ± 21.2) component summaries of SF-36 score were lower (p < 0.001) than in women with dysmenorrhea (67.5 ± 21.4 and 67.5 ± 20.4, respectively).

SF-36 score was not related to a woman’s age but it was inversely related to the intensity of intermenstrual pelvic pain (r = 0.285; p = 0.0001), of dysmenorrhea (r = 0.139; p = 0.028) and of dyspareunia (r = 0.165; p = 0.009). This
was true even considering the physical component summary of SF-36. The mental component of SF-36 was related inversely only to the intensity of intermenstrual pelvic pain (\( r = 0.240; p = 0.0001 \)) and of dyspareunia (\( r = 0.184; p = 0.0035 \)), but not of dysmenorrhea (\( r = 0.083; p = 0.19 \)).

In a regression model including age, BMI, marital status, educational level, menstrual flow length (days), previous pregnancies, further desire for pregnancy, intensity of dysmenorrhea, of intermenstrual pelvic pain and of dyspareunia as independent variables, the SF-36 score was independently related (\( r = 0.307 \)) only to intermenstrual pelvic pain (\( \text{CR} \ -1.522; 95\% \ CI \ -2.188 \text{ to} \ -0.856; p < 0.0001 \)) and, to a lower degree, dysmenorrhea (\( \text{CR} \ -0.729; 95\% \ CI \ -1.487 \text{ to} \ -0.030; p = 0.06 \)). The physical component summary of SF-36 was independently related (\( r = 0.335 \)) to intermenstrual pelvic pain (\( \text{CR} \ -1.792; 95\% \ CI \ -2.518 \text{ to} \ -1.066; p < 0.0001 \)) and dysmenorrhea (\( \text{CR} \ -0.956; 95\% \ CI \ -1.783 \text{ to} \ -0.0129; p = 0.024 \)), while the mental component was only independently related to intermenstrual pelvic pain (\( \text{CR} \ -1.610; 95\% \ CI \ -2.429 \text{ to} \ -0.792; r = 0.240; p = 0.0001 \)).

**Depressive Symptoms**

The SF-36 score was inversely related to the SDS score (\( y = 109.4 – 1.26x; r = 0.611; p = 0.0001 \)).

Women with intermenstrual pelvic pain showed a higher SDS score (40.2± 9.1) than women with dysmenorrhea alone (35.5± 8.4; \( p < 0.002 \)), but not dyspareunia (37.8± 10.6; \( p = 0.23 \)). The SDS score was not related to the intensity of dysmenorrhea (\( r = 0.10; p = 0.11 \)) or dyspareunia (\( r = 0.011; p = 0.09 \)), but was directly related to the intensity of intermenstrual pelvic pain (\( r = 0.216; p = 0.0008 \)).

In the multiple regression model, SDS was independently related (\( r = 0.216 \)) only to the intensity of intermenstrual pelvic pain (\( \text{CR} 0.573; 95\% \ CI \ 0.241–0.904; p = 0.0008 \)).

**Discussion**

Women with intermenstrual pelvic pain did not differ from women with dysmenorrhea alone or dyspareunia on any of the basal features, apart from quality of life and depressive mood that were worse in these women. This may be the consequence of symptoms such as dysmenorrhea and dyspareunia, which often coexist with intermenstrual pelvic pain. On the other hand, when all types of pain are entered into multiple regression analysis, health-related quality of life and mood are negatively associated mainly with intermenstrual pelvic pain, even if this is the less intense pain on a VAS scale. Reduced health-related quality of life is associated with depressive mood [12, 14].

Pelvic pain can be cyclic or noncyclic, spontaneous or induced, predictable or unpredictable.

The prototype of cyclic, spontaneous and predictable pelvic pain is dysmenorrhea. It occurs during every menstrual cycle, at a precise moment, more or less similarly. Women can usually cope with this type of pain, with no major impact on their quality of life and mood, except for a small alteration of the physical domains of their health-related quality of life.

Deep dyspareunia is noncyclic, it is induced and predictable. The cause-effect relationship with sexual intercourse makes it somewhat preventable. It could have an impact on women’s quality of life by influencing both physical and mental domains, but its role is apparently obscured by intermenstrual pelvic pain, which is often associated. Intermenstrual pelvic pain is a spontaneous, not always cyclic, not preventable and unpredictable type of pain. Inability to control and predict its occurrence probably makes intermenstrual pelvic pain the most debilitating type of pelvic pain, and the one mostly associated with a poor health-related quality of life. Women with intermenstrual pelvic pain also totaled the worst depressive scores. This evidence adds to the observation reported in a previous study which documented the association between depressive symptoms and pain intensity without discriminating between the different types of pelvic pain [12]. The association of pain with psychological disturbances reported in the present and previous studies [12] may be interpreted in a bidirectional way, i.e. depression favors pain perception or pain depresses mood [20]. Interventional studies on both sides are necessary to clarify this issue, but it is likely that medical treatment of depressive mood may help to improve the quality of life of women with pelvic pain [21, 22].

One of the most important limitations of this research is that, in addition to pelvic pain, quality of life and depressive symptoms can depend on different coexisting elements that were only evaluated partially in the present study. Furthermore, we did not take into account the single organic cause of pelvic pain, which was considered as a unique syndrome. In some studies, knowledge of the causes of pain per se does not influence quality of life and psychological status [23, 24]. In other studies, it seems that the diagnosis itself can influence quality of life and mood [17, 25] because psychological effects could arise
from specific diseases (for example, the risk of infertility associated with endometriosis). Accordingly, it is likely that in our study the 'knowledge bias' has been eliminated by including subjects unaware of the organic cause of their pain.

The present data have been obtained in a selected population of women examined in an outpatient department for pelvic pain. Accordingly, the results are limited to women requesting treatment for their pain, and cannot be generalized to the general population. Among this selected sample of subjects, intermenstrual pelvic pain seems to be most strongly associated with a reduced quality of life and depressive mood.

Acknowledgements

We thank Cindy Argento, MD, for manuscript editing and Maria Quartieri for patient management.

References

1 Zondervan KT, Yudkin PL, Vissey MP, Jenkinson CP, Dawes MG, Barlow DH, Kennedy SH: Chronic pelvic pain in the community – symptoms, investigations and diagnoses. Am J Obstet Gynecol 2001;184:1149–1155.
2 Mathias SD, Kuppermann M, Liberman RF, Grace VM, Zondervan KT: Chronic pelvic pain: prevalence, health-related quality of life and economic correlates. Obstet Gynecol 1996;87:321–327.
3 Pitts MK, Ferris JA, Smith AM, Shelley JM, Richters J: Prevalence and correlates of three types of pelvic pain in a nationally representative sample of Australian women. Med J Aust 2008;189:138–143.
4 Zondervan KT, Yudkin PL, Vissey MP, Dawes MG, Barlow DH, Kennedy SH: The prevalence of chronic pelvic pain in women in the United Kingdom: a systematic review. Br J Obstet Gynaecol 1998;105:93–99.
5 Grace VM, Zondervan KT: Chronic pelvic pain in New Zealand: prevalence, pain severity, diagnoses and use of the health services. Aust N Z J Publ Heal 2004;28:369–375.
6 Fenton BW, Brobeck L, Witten E, Von Gruenigen V: Chronic pelvic pain syndrome-related diagnoses in an outpatient office setting. Gynecol Obstet Invest 2012;74:64–67.
7 Fenton BW, Durner C, Fanning J: Frequency and distribution of multiple diagnoses in chronic pelvic pain related to previous abuse or drug-seeking behavior. Gynecol Obstet Invest 2008;65:247–251.
8 Vercellini P, Somigliana E, Viganò P, Abbati A, Barbara G, Fedele L: Chronic pelvic pain in women: etiology, pathogenesis and diagnostic approach. Gynecol Endocrinol 2009;25:149–158.
9 Latthe P, Mignini L, Gray R, Hills R, Khan K: Factors predisposing women to chronic pelvic pain: a systematic review. BJM 2006;332:749–755.
10 Jones GL, Phil D, Kennedy SH, Jenkinson C: Health-related quality of life measurements in women with common gynecologic benign conditions: a systematic review. Am J Obstet Gynecol 2002;187:501–511.
11 Laursen BS, Bajaj P, Olesen AS, Delmar C, Arendt-Nielsen L: Health-related quality of life and quantitative pain measurement in females with chronic non-malignant pain. Eur J Pain 2005;9:267–275.
12 Barcelos PR, Conde DM, Deus JM, Martinez EZ: Quality of life of women with chronic pelvic pain: a cross-sectional analytical study. Rev Bras Gynecol Obstet 2010;32:247–253.
13 Lorenzatto C, Vieira MJN, Pinto CLB, Petta CA: Evaluation of the frequency of depression in patients with endometriosis and pelvic pain. Rev Assoc Med Bras 2002;48:217–221.
14 Romão AP, Gorayeb R, Romão GS, Poli-Neto OB, dos Reis FJ, Rosa-e-Silva JC, Nogueira AA: High levels of anxiety and depression have a negative effect on quality of life of women with chronic pelvic pain. Int J Clin Pract 2009;63:707–711.
15 Neelakantan D, Omojole F, Clark TJ, Gupta JK, Khan KS: Quality of life instruments in studies of chronic pelvic pain: a systematic review. J Obstet Gynaecol 2004;24:851–858.
16 Ware JE Jr, Sherbourne CD: The MOS 36-item short-form health survey (SF-36). I. Conceptual framework and item selection. Med Care 1992;30:473–483.
17 Magni G, Andreoli C, de Leo D, Martinotti G, Rossi C: Psychological profile of women with chronic pelvic pain. Arch Gynecol 1986;237:165–168.
18 Zung WWK: A self-rating depression scale. Arch Gen Psychiatry 1965;12:63–70.
19 Biggs JT, Wylie LT, Ziegler VE: Validity of the Zung Self-Rating Depression Scale. Br J Psychiatry 1978;132:381–385.
20 Doan BD, Wadden NP: Relationships between depression symptoms and descriptions of chronic pain. Pain 1989;36:75–84.
21 Maizels M, McCarberg B: Antidepressants and antiepileptic drugs for chronic non-cancer pain. Am Fam Physician 2005;71:483–490.
22 Dharmshaktu P, Tayal V, Kaira BS: Efficacy of antidepressants as analgesics: a review. J Clin Pharmacol 2012;52:6–17.
23 Roth RS, Punch M, Bachman JE: Psychological factors in chronic pelvic pain due to endometriosis: a comparative study. Gynecol Obstet Invest 2011;72:15–19.
24 Tripoli TM, Sato H, Sartori MG, de Araujo FF, Girão MJ, Schor E: Evaluation of quality of life and sexual satisfaction in women suffering from chronic pelvic pain with or without endometriosis. J Sex Med 2011;8:497–503.
25 Nnoaham KE, Hummelshoj L, Webster P, d’Hooghe T, de Cicco Nardone F, de Cicco Nardone C, Jenkinson C, Kennedy SH, Zondervan KT: Impact of endometriosis on quality of life and work productivity: a multicenter study across ten countries. Fertil Steril 2011;96:366–373.