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A Systematic Review of the Association Between Psychiatric Disturbances and Endometriosis

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Abstract

Objective: An association between endometriosis and psychiatric disturbances has been identified by some researchers. The purpose of this systematic review was to consolidate existing empirical findings to clarify the association between endometriosis and psychiatric conditions.

Data Sources: We searched three electronic databases (Medline/PubMed, PsychInfo, and ClinicalTrials.gov) using the following search items: "endometriosis" combined with "mood," "bipolar disorder," "major depressive disorder," "anxiety," "psychiatric," "psychosocial," "antidepressants," "antianxiety," "pharmacotherapy," or "psychotherapy."

Study Selection: We included all relevant articles published in English. We identified 18 original research studies examining the association between endometriosis and psychiatric symptoms, with a combined total of 999 endometriosis patients being examined.

Data Extraction and Synthesis: Of the 18 studies examined, 14 reported that endometriosis was associated with at least some aspect of reduced psychological functioning or mental health quality of life. Tabulation of raw frequencies of the studies using clinical diagnostic criteria and a comparison group revealed that at least 56.4% of women (44/78) with a diagnosis of endometriosis and 43.6% of women (48/110) without such a diagnosis met the criteria for a psychiatric disorder.

Conclusion: The limited research suggests that women presenting with endometriosis are at risk for psychosocial disturbances or psychiatric distress. Whether such disruptions are a consequence of endometriosis, the associated chronic gynaecological pain, or another factor such as inflammation remains to be delineated. In the interim, women presenting with symptoms of endometriosis should also be screened for psychosocial and psychiatric disturbances.

Key Words: Anxiety, depression, endometriosis, mood disorders, pain, therapeutics

Competing Interests: None declared.

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Résumé

Objectif : Une association entre l'endométriose et des perturbations psychiatriques a été identifiée par certains chercheurs. Cette analyse systématique avait pour but de consolider les constatations empiriques existantes en vue de clarifier l'association entre l'endométriose et des troubles psychiatriques.

Sources de données : Nous avons mené des recherches dans trois bases de données électroniques (Medline/PubMed, PsychInfo et ClinicalTrials.gov) au moyen des termes suivants : « *endometriosis* » en combinaison avec « *mood* », « *bipolar disorder* », « *major depressive disorder* », « *anxiety* », « *psychiatric* », « *psychosocial* », « *antidepressants* », « *antianxiety* », « *pharmacotherapy* » ou « *psychotherapy* ».

Sélection des études : Nous avons inclus tous les articles pertinents publiés en anglais. Nous avons identifié 18 études originales s'étant penchées sur l'association entre l'endométriose et des symptômes psychiatriques (pour un total combiné de 999 cas d'endométriose soumis à une analyse).

Extraction et synthèse des données : Parmi les 18 études examinées, 14 ont signalé que l'endométriose était au moins d'une certaine façon associée à une atténuation du fonctionnement psychologique ou de la qualité de vie liée à la santé mentale. La tabulation des fréquences brutes de ces études au moyen de critères diagnostiques cliniques et d'un groupe de comparaison a révélé qu'au moins 56,4 % des femmes (44/78) ayant obtenu un diagnostic d'endométriose et 43,6 % des femmes (48/110) n'ayant pas obtenu un tel diagnostic satisfaisaient aux critères permettant d'établir la présence d'un trouble psychiatrique.

Conclusion : Les recherches limitées semblent indiquer que les femmes qui présentent une endométriose sont exposées à des risques de perturbations psychosociales ou de détresse psychiatrique. La question de savoir si de telles perturbations sont une conséquence de l'endométriose, de la douleur gynécologique chronique connexe ou d'autres facteurs tels que l'inflammation demeure à élucider. Entre-temps, les femmes qui présentent des symptômes d'endométriose devraient également faire l'objet d'un dépistage visant des perturbations psychosociales et psychiatriques.

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INTRODUCTION

Endometriosis is a benign chronic and often progressive gynaecological condition that affects 10% to 15% of women who are of reproductive age and is one of the main causes of female infertility.[1–3] The disorder is defined by the presence of endometrial glands and stroma outside the uterus, resulting in an estrogen-dependent chronic inflammatory response.[4] The American Society for Reproductive Medicine classifies endometriosis into four stages, with stage I and II representing initial stages and III and IV representing advanced stages.[5] A definitive cause for endometriosis has yet to be established. However, some theories have been proposed: the most widely accepted theory asserts that immune dysfunction and abnormal differentiation of endometriotic tissue are implicated in the development of the disorder.[4] Other possibilities include genetic or environmental factors, in association with either normal or greater than normal retrograde menstruation. Risk factors such as alcohol and caffeine use have also been identified.[6–9]

Endometriosis is a major cause of disability and impaired quality of life for women of reproductive age, because the disorder can result in chronic and severe pelvic pain. It is associated with dysmenorrhea, dyspareunia, gastrointestinal problems, fatigue, headaches, deep pelvic pain, and lower abdominal pain both with and without back pain.[7,10–12] Women with endometriosis may also experience disturbances in work, family relationships, social life, self-esteem, and mood symptoms.[13,14] In spite of the significant potential psychosocial implications of endometriosis, there is a paucity of research regarding the link between endometriosis and psychiatric symptoms. Thus, we wished to add to the existing literature by providing an overview of what is known about the associations between psychiatric symptoms and endometriosis. Such information is important for treating clinicians, such as gynaecologists, because psychiatric disorders may influence gynaecological patients' perception and reporting of symptoms, their prognosis and compliance with treatment, and their overall well-being.

METHODS

Sources

A literature search for this systematic review was conducted for studies published in English prior to December 2014. Three electronic databases (Medline/PubMed, PsychInfo, and ClinicalTrials.gov) were searched. The following title or abstract search items were used: "endometriosis" with "mood," "bipolar disorder," "major depressive disorder," "anxiety," "psychiatric," "psychosocial," "antidepressants," "antianxiety," "pharmacotherapy," and "psychotherapy." The search identified 119 articles. The reference lists of articles identified were also searched to identify other relevant publications.

Study Selection

All relevant articles published in English were considered in this review; we identified 18 original quantitative research studies examining the association between endometriosis and psychiatric symptoms or quality of life. Fourteen of the 18 studies used at least one comparison group. Taken together, these studies assessed 999 women with endometriosis and 857 women acting as controls (397 women with chronic pelvic pain due to another medical condition, 32 women with migraine headaches, 78 infertile women, and 350 healthy controls).

RESULTS

Details related to each of the identified 18 quantitative studies and relevant statistics (where available) are presented in Table 1. Fourteen of the 18 studies reported that endometriosis or chronic pelvic pain significantly reduced at least some aspect of psychological functioning, mental health, or quality of life, many reporting elevated risk for depressive, hypomanic, or anxiety symptoms. All samples were derived from a clinical patient population, with the exception of the study by Barnack and Chrisler, who recruited from the community.[15] Pharmacological intervention characteristics of the sample, where available, are also detailed in Table 1.

Only four of the identified studies[16,18,29,30] used clinical diagnostic criteria to assess for psychiatric diagnosis, and three of these[16,18,29] used a comparator group. Each of these three studies used clinical samples of women who ranged in age from late teens to mid-40s. Unfortunately, only the study by Kumar and colleagues provided further demographic patient characteristics.[18] Notably, in their study 37% of participants in the endometriosis group and 50% in the pelvic pain group reported a family history of mood disorders; they also clarified that none of the patients in their study were undergoing treatment with a GnRH agonist.[18] None of the studies reported on other pharmacological, surgical, or psychosocial interventions. Of the three studies using a comparator group, two found women with endometriosis to be at an increased risk for a psychiatric disorder.[16,18] One of the studies used a healthy control group[16] and the other consisted of women with chronic pelvic pain due to another medical condition.[18] Combined, 44 of the 79 women with endometriosis in these three studies (56%) met the criteria for at least one psychiatric disorder. Not all studies assessed participants

Table 1. Summary of quantitative studies investigating the association between psychiatric and psychosocial distress and endometriosis

Source	Number of sample (pharmacological characteristics)	Relevant symptoms/ disorder assessed	Relevant finding
Carey et al.[1]*	79 (endometriosis) (during study 19 using ANT and 23 using HT; 45 ever used HT)	Depression and catastrophization	An association was identified between catastrophization and affective pain score (β = 0.66, P = 0.01). Depression was not associated with pain severity.
Cavaggioni et al.[16]	37 (endometriosis) 43 (control)	Psychiatric disorder as defined by the DSM-IV	A significant difference was found between the rate of psychiatric disorders in women with endometriosis compared to the control group (χ^2 = 10.99, P = 0.001).
Smorgick et al.[17]*	138 (endometriosis) (136 used HT)	Depression and anxiety	48% of women in the sample had a mood condition and 99% reported pelvic pain. Women with other comorbid pain syndromes were more likely to report mood conditions (OR 2.01, P < 0.001).
Kumar et al.[18]	27 (endometriosis) 12 (chronic pelvic pain) (none undergoing treatment with a GnRH agonist)	Bipolar disorder and major depressive disorder	Women with pelvic pain related to endometriosis were significantly more likely to have a diagnosis of bipolar disorder (χ^2 = 8.01, P < 0.005) but not major depressive disorder.
Tripoli et al.[12]	49 (endometriosis) 35 (chronic pelvic pain) 50 (health women)	Psychological quality of life	The two groups of symptomatic women endorsed reduced psychological health compared to the control group (P < 0.05).
Garalejić et al.[19]	40 (endometriosis) 47 (infertile women)	Anxiety	Higher anxiety was reported by the endometriosis group than the control group but not at a statistically significant level.
Kumar et al. [20]	100 (endometriosis) 100 (chronic pelvic pain) 100 (healthy women)	Depression	Women with chronic pelvic pain scored higher on depression symptoms than women with endometriosis who in turn scored higher than the health women (F = 7.28, df = 2297 P = 0.01).
Roth et al.[21]	30 (endometriosis with chronic pelvic pain) 108 (chronic pelvic pain)	Depressive symptoms and affective distress.	No difference was found in depression severity, affective distress, or pain severity between women diagnosed with endometriosis and the comparator group.
Sepulcri & do Amaral[22]*	104 (endometriosis) (none used NSAIDs, anxiolytics, or ANT in the 3 months preceding assessment)	Depression and anxiety	64.4% of women endorsed depression of moderate to severe severity and 63% met study criteria for major anxiety. There were statistically significant positive associations between current pain and measures of anxiety symptoms.
Eriksen et al.[23]	63 (endometriosis) 20 (health women)	Depression and anxiety	For women with endometriosis, there was no significant association found between pain and anxiety and depression.
Petrelluzzi et al.[24]	93 (endometriosis) 82 (health women) (controls not taking hormonal anti-inflammatories; 53% of the endometriosis group and 32% of controls using OC; 7% of endometriosis group on ANT)	Stress and mental health quality of life	Women with endometriosis and chronic pelvic pain of moderate intensity had higher levels of perceived stress (P < 0.05) and poorer mental health quality of life than healthy controls (P < 0.001).
Siedentopf et al.[25]	38 (endometriosis) 31 (infertile women) (excluded women on immunosuppressive, hormonal, or IVF treatment)	Stress and depression	Women with endometriosis reported increased stress perception/ depressive symptoms (P < 0.05)

Continued

Table 1. Continued

Source	Number of sample (pharmacological characteristics)	Relevant symptoms/ disorder assessed	Relevant finding
Barnack and Chrisler[15]	41 (endometriosis) 32 (migraines)	Psychological well-being and stress	Women with endometriosis had fewer referrals to a psychologist. Women with migraine headaches had better emotional functioning ($P < 0.05$), less pain ($P < 0.05$), and less role limitations due to emotional problems than women with endometriosis.
Lorençatto et al.[26]	50 (endometriosis) 50 (chronic pelvic pain) (excluded patients who had initiated any treatment in the two months preceding study)	Depression	86% and 38% of all women in the study sample with and without chronic pelvic pain, respectively, met the study criteria for depression ($P < 0.001$).
Peveler et al.[27]	40 (endometriosis) 51 (chronic pelvic pain)	Mood symptoms, personality characteristics, social adjustment	There was no significant difference in mood symptoms between the two groups, however women in the endometriosis group reported more "nerve trouble" than did the comparison group ($\chi^2 = 7.50$, $df = 1$, $P = 0.006$).
Low et al.[28]	40 (endometriosis) 41 (chronic pelvic pain)	Personality variables, depression, and anxiety	Women with endometriosis endorsed higher levels of state anxiety ($F = 5.60$, $df = 1,80$, $P \leq 0.05$), and trait anxiety ($F = 4.32$, $df = 1,80$, $P \leq 0.05$) compared to women with pain related to other gynaecological conditions. The two groups did not differ on pain ratings or depression scores.
Walker et al.[29]	14 (endometriosis) 55 (controls)	Bipolar disorder and major depressive disorder	No significant differences in prevalence of mood disorders were found.
Lewis et al.[30]*	16 (endometriosis)	Bipolar disorder and major depressive disorder	In this sample, 10 (62.5%) of the women met criteria for bipolar disorder and 2 (12.5%) met criteria for major depressive disorder.

ANT: antidepressant medication; DSM-IV: Diagnostic and Statistical Manual of Mental Disorders Forth Edition; HT: hormone therapy; NSAID: non-steroidal anti-inflammatory drug; OC = oral contraceptive.

*Indicates no control or comparison group used.

Table 2. Tabulation of psychiatric diagnosis identified through clinical diagnostic assessment

Psychiatric disorder assessed	Endometriosis diagnosed	
Frequency (%)	Yes (n = 78)	No (n = 110)
Psychotic disorder	1 (1.3)	0 (0.0)
Bipolar disorders	13 (16.7)	3 (2.7)
Bipolar I disorder	1 (1.3)	
Bipolar II disorder	4 (5.1)	
Bipolar disorder NOS	8 (10.3)	
Depressive disorders	18 (23.1)	41 (37.3)
Major depressive disorder	14 (18.0)	40 (36.4)
Depressive disorder NOS	1 (1.3)	0 (0.0)
Dysthymic disorder	3 (3.9)	1 (0.9)
Anxiety disorders	10 (12.8)	3 (2.7)
Panic disorder	1 (1.3)	0 (0.0)
Generalized anxiety disorder	1 (1.3)	1 (0.9)
Specific phobia	3 (3.9)	2 (1.8)
Social phobia	1 (1.3)	0 (0.0)
Anxiety disorder NOS	4 (5.1)	0 (0.0)
Obsessive–compulsive disorder	1 (1.3)	0 (0.0)
Undifferentiated somatoform disorder	1 (1.3)	0 (0.0)
Eating disorder NOS	0 (0)	1 (0.9)
Total psychiatric diagnosis identified	44 (56.4)	48 (43.6)

Note: NOS = not otherwise specified

for all potential psychiatric diagnoses. A tabulation of the results from the studies by Cavaggioni et al., Kumar et al., and Walker et al. are presented in Table 2.[16,18,29]

All three studies assessed participants for major depressive disorder and bipolar disorder. As can be seen in Table 2, 16.7% of the women with endometriosis met the criteria for one of the forms of bipolar disorder, compared to only 2.7% of women in the comparison group.[16,18,29] In addition, 23.1% of women in the endometriosis group had a diagnosis of one of the depressive disorders, compared to 37.3% of women in the comparison group. Taken together, 35.9% of women with endometriosis and 40% of women without endometriosis met the criteria for a mood disorder. Only the study by Cavaggioni et al. assessed participants for other potential disorders in either group.[16] Thus, the tabulation presented here may under report psychiatric diagnoses in these women. When considering all potential diagnoses, 56.4% of women with endometriosis and 43.6% of women without endometriosis met the criteria for a psychiatric disorder. Unfortunately, due to variation in both index and comparison groups we were unable to draw inferences about the potential association of pelvic pain (related and unrelated to endometriosis) and psychiatric diagnosis.

DISCUSSION

Endometriosis has been reported to be associated with a high rate of psychiatric symptoms, namely depression, anxiety, increased stress, and overall poor quality of life.[17,31] Psychiatric comorbidity may influence the evaluation of the disorder, because anxiety, depression, and coping methods used may complicate the evaluation of chronic pain and the diagnosis of endometriosis.[1,16,22,23,32] In addition, psychosocial factors may also influence the success of interventions.[1]

Depression and anxiety are common comorbid conditions that are reported in some research to be associated with endometriosis.[17] In women with endometriosis, depression and anxiety have been found to co-occur and positively correlate ($r = 0.41$, $P < 0.001$) with each other,[33] although it is not unusual for anxiety and depression to co-occur together in cohorts of women without endometriosis.[34] Sepulcri and Amaral found that in a sample of 104 women with a diagnosis of pelvic endometriosis, 64.4% endorsed moderate-to-severe depressive symptom levels and 63.5% reported high levels of anxiety symptoms. In this sample, age was positively correlated with depressive symptoms, but an association was not found between age and anxiety

symptoms.[22] Low and colleagues found that women with endometriosis had higher anxiety scores and endorsed higher levels of psychoticism and introversion than a comparison group of women with other gynaecological conditions.[28]

The prevalence of depression is reported to be greater in women who have endometriosis with chronic pelvic pain than in women who have endometriosis but no pain symptoms. In the study by Lorençatto and colleagues,[26] 86% and 38% of the women in the study sample with and without chronic pelvic pain, respectively, met the study criteria for depression ($P < 0.001$). Depression, somatic awareness, and catastrophization of pain were found to be associated with pain intensity in women who were experiencing pelvic pain.[26] Thus, it may not be endometriosis per se that is responsible for depression but rather the experience of chronic pelvic pain. For instance, Roth and colleagues found no difference in depressive symptom severity or level of affective distress when comparing women with pelvic pain due to endometriosis to women with pelvic pain due to another somatic condition.[21] Further, Cavaggioni and colleagues recently found that women with endometriosis had higher rates of mood and anxiety disorders and that the prevalence was greater in women who also experienced endometriosis-related pain, compared to pain free women.[16] Barnack and Chrisler[15] found that compared to another form of chronic pain experience (migraine headache), women with chronic pelvic pain endorsed greater pain and perceived stress than did women with migraine headaches, suggesting that factors related to the pain of endometriosis specifically have implications for women's mental health. It is possible that there are differences in the pathogenesis or consequences of the pain.

A relationship between bipolar disorder and endometriosis has been reported in two studies.[18,30] However, Walker and colleagues failed to find evidence of this association; the prevalence of mood disorders was not different in women with endometriosis and women without endometriosis.[29] It is important to note that half of the participants in the study of Walker et al. were asymptomatic with respect to the experience of pelvic pain, because research suggests psychiatric disturbances may be a consequence of the pelvic pain or other symptoms in endometriosis. Kumar and colleagues found that women with endometriosis accompanied by pelvic pain were significantly more likely to have bipolar disorder than women who had pelvic pain not related to endometriosis.[18] These findings suggest that there may be an association between endometriosis and bipolar disorder beyond the experience of pelvic pain, perhaps as a consequence of a shared pathogenesis of the disorders such as disturbances in immune functioning.[13,35] However, as noted by Kumar et al., both bipolar disorder and endometriosis are common in women of reproductive age, making it difficult to determine if there is a cause and effect association.[18]

Combined, the results from the existing literature suggest that psychiatric disruptions associated with endometriosis are likely a result of women struggling with chronic pain and its related disability or other consequences associated with endometriosis, such as infertility, sexual dysfunction, and the corresponding psychological consequences.[21,36] It is also possible that for some women the association is a result of other conditions associated both with endometriosis and mood disorders, such as autoimmune disease.[37,38] Unfortunately, our current knowledge of the association between endometriosis and psychiatric disorders is limited because of methodological differences in the existing research and the limited number of controlled studies. Moreover, only two of the studies reviewed used clinical diagnostic criteria to measure the prevalence of comorbid psychiatric disorders.[16,18] Due to the nature of the disease, studies investigating endometriosis are often limited to convenience samples, which may limit the generalizability of findings.[16] Further, the characteristics of the index group varied between studies; some included women with a diagnosis of endometriosis[1,16–19,20,22–26,29] and some used a sample of women with chronic pelvic pain secondary to endometriosis.[12,21,24,27,28] Although a number of the studies did use a comparison group, there were salient differences in the comparison groups used, including women with pelvic pain not related to endometriosis,[12,18,20,21,26–28] women with other forms of chronic pain,[25] women who were infertile,[19,25] and healthy women.[12,16,17,20,23,24,29] Additionally, if women are asymptomatic it does not necessarily rule out endometriosis, and thus healthy comparison groups may include individuals with asymptomatic endometriosis. As the diagnosis of endometriosis requires visualization of lesions at the time of laparoscopy or laparotomy,[4] conclusively ruling out endometriosis in healthy individuals would require an invasive procedure. In addition, an investigation for endometriosis often follows symptomatic complaints, primarily infertility or persistent pelvic pain. Both of these complaints have been associated with psychiatric comorbidity irrespective of cause.[39,40]

Symptoms of endometriosis may often be dismissed as somatization or normal menstrual pain.[41] As a result, the diagnosis of endometriosis may not be considered by clinicians, and this can lead to women not having a diagnosis

or appropriate treatment for the condition until years after the onset of symptoms.[42] Vercellini et al. reported that the severity of symptoms experienced by patients and actual objective findings are only weakly correlated, thereby further complicating identification of the disease.[43]

As the severity of pain in women with endometriosis is not closely associated with the stage of the condition, it has been suggested that the pain related to the disorder has a multifactorial etiology.[22,44] Vercellini and colleagues have noted that treatment, be it medical or surgical, is not always effective in preventing or eliminating chronic pelvic pain.[45] This may be a result of the pain related to endometriosis stemming from nociceptive, inflammatory, and neuropathic mechanisms.[13] Some researchers have suggested that the pain associated with endometriosis may not dissipate with treatment or correlate with stage of the illness because the inflammatory process causes sensitization of nociceptors and central neurons. Thus, it has been recommended by several authorities that if hormonal medical management alone fails in women with endometriosis, then medication used for management of inflammation and neuropathic pain, such as amitriptyline or gabapentin, should be considered.[4,13,33,46]

Chronic pelvic pain has been found to be associated with negative psychological, physical, and social consequences, including mood swings and moderate-to-severe levels of depression and anxiety. These associated issues may be a consequence of the long delay between the onset of symptoms and the diagnosis of endometriosis, which was reported by Arruda et al. to range between 3.5 and 12 years, with longer delays occurring for women who are younger at symptom onset.[47] In addition to unpleasant and hard-to-manage symptoms, long delays before diagnosis may result in women being subjected to prolonged pain, increased stress, sexual dissatisfaction, and decreased self-esteem,[12–14,31] which may increase the risk for psychiatric complications.

Because endometriosis is estrogen-dependent, treatment has traditionally sought to reduce estrogen activity. Unfortunately, suppression of estrogen production by the ovaries has variable effects and, for many women, management of pain associated with endometriosis is insufficient.[13] Specific medical and pharmaceutical management of endometriosis may include treatment with continuous or cyclic combined oral contraceptives, progestogens, gonadotropin-releasing hormone (GnRH) agonists with or without add-back hormonal therapy, progestin-releasing intrauterine systems, danazol, and laparoscopic surgical excision of the endometriotic lesions.[4,13,17]

Some of the treatment options for endometriosis are associated with adverse side effects including the experience of psychiatric symptoms. For instance, oral contraceptives have been associated with adverse psychiatric side effects in some women. Reported side effects include decreased psychosexual arousal or negative changes in mood.[48] A history of depression, psychiatric distress, premenstrual mood symptoms prior to oral contraceptive use, dysmenorrhea, or antenatal and postnatal mood symptoms have also been reported to increase the risk for psychiatric disturbance related to oral contraceptive use.[49]

GnRH agonists suppress ovarian hormone production and may be used to treat endometriotic lesions and associated pelvic pain.[50] However, GnRH agonists used to treat endometriosis have been found to be associated with emotional lability and depression.[51] Physical and psychiatric side effects associated with GnRH agonist therapy have been thought to be related to the reduction in plasma concentrations of estrogen and testosterone. Prophylactic treatment with an antidepressant when initiating GnRH antagonist treatment may reduce the risk for the experience of treatment-induced mood symptoms.[50]

Tripoli and colleagues found that untreated depression influenced a patients' ability to cope with pain and could impede daily functioning and quality of life.[12] Consequently, some authorities have recommended antidepressants as adjunctive treatment for chronic pelvic pain,[52] regardless of the treatment for endometriosis being used. However, because women with endometriosis may also present with an elevated risk for bipolar disorder, the use of antidepressants should be considered only after bipolar disorder has been ruled out.[53,54] In addition, as antidepressants have been found to induce mania in susceptible individuals, women with endometriosis should be carefully monitored for manic symptoms when initiating treatment with an antidepressant.[18,53,54]

This review is limited by the paucity of research to date and the variability in sample characteristics. We did not include studies published in languages other than English in our review. Our review also was limited by methodological differences between original studies because the characteristics of the index group (such as the inclusion or exclusion of women without pelvic pain related to the diagnosis of endometriosis) varied between studies. The characteristics of the control groups used (i.e., pelvic pain not related to endometriosis, women with other forms of chronic pain, women who were infertile, healthy women) also varied between studies. Most studies did not provide specific information about pharmacological, surgical, or psychosocial interventions being used by patients

in their sample. As researchers have recently found that interventions have the potential to attenuate or encourage psychiatric symptoms, such information would be valuable when interpreting the literature and should be considered in future investigations.

There is clearly a pressing need for more research to better understand the relationship between endometriosis and psychiatric disorders. The investigations to date vary in methodology, and only three studies to date have used diagnostic criteria to confirm diagnosis. Only one study in this review investigated the co-occurrence of psychiatric disorders beyond mood disorders in relation to endometriosis. Larger and better-controlled studies are required to ascertain if there is in fact a higher prevalence of psychiatric disorders in women with endometriosis. These studies should examine the range of potential psychiatric diagnoses and potential comorbidity using structured clinical diagnostic interviews. The experience and severity of pain related to endometriosis should also be assessed to determine the potential relationship between endometriotic pain symptoms and psychiatric disorders. Because pelvic pain is not the only source of pain or discomfort experienced as a consequence of endometriosis, future research should examine various gynaecological pain symptoms in relation to psychiatric disorders.

Despite the sparse and conflicting research findings, there appears to be sufficient evidence to suggest a relationship between endometriosis (or chronic pelvic pain) and an increased risk of psychosocial symptoms compared to women who do not report chronic pelvic pain. Thus, until more definitive evidence is available, we suggest that women with endometriosis or chronic pelvic pain be screened for psychiatric comorbidity, especially when there is severe pelvic pain present. Potential screening instruments may include the Mood Disorder Questionnaire[55] to assess for manic symptoms and the Beck Anxiety Inventory[56] and the Beck Depression Inventory II[57] to assess for anxiety or depression. If warranted, a more comprehensive clinical assessment to confirm diagnosis may include the Structured Clinical Interview for DSM-IV Axis I disorders[58] or the MINI International Neuropsychiatric Interview.[59]

The research evidence also suggests that after beginning treatment for endometriosis, women should be monitored for psychiatric side effects. Women who do experience psychiatric complications may require pharmacological or psychosocial interventions. Initial research suggests that antidepressant therapy may reduce both depressive symptoms associated with endometriosis and depressive symptoms associated with some treatments for endometriosis.[50,52] Preliminary evidence by Sator-Katzenschlager et al. suggests that some medications used to treat psychiatric disorders (including gabapentin and amitriptyline) may also be effective in treating chronic pain symptoms and thus may be beneficial for some women with endometriosis.[46] Psychosocial therapy may be of benefit in treating physical and psychiatric symptoms associated with chronic pelvic pain related to endometriosis.[14,31] For example, Kold and colleagues have suggested that mindfulness-based therapy may help women with endometriosis reduce perceived pain and improve well-being and daily functioning.[14] However, as research on psychosocial interventions for women with endometriosis is limited, future studies could extend these initial findings.

CONCLUSION

Understanding the relationship between psychiatric disturbance and pain expression in women with chronic pelvic pain due to endometriosis can be very challenging for clinicians. The experience of chronic pelvic pain may promote psychiatric conditions such as depression or anxiety, thus mediating the relationship between endometriosis and psychiatric disturbances. Alternatively, psychiatric disturbance may exacerbate perceived pain levels and may complicate patients' responses to treatment and their overall prognosis. In addition to chronic pain, women with endometriosis also often encounter other difficulties that may influence their well-being, including infertility, social isolation, and relationship difficulties, which could also mediate the relationship between endometriosis and psychiatric disorders. Alternatively, if a relationship between psychiatric disorders and endometriosis is established in future research, it may be shown that an alternative physiological factor, such as inflammation, is responsible for both disorders. Future studies should control for the influence of endometriosis treatment, as such treatment may also be associated with psychiatric disturbances. We recommend that women presenting with chronic gynaecological pain or endometriosis also be assessed for potential social, relationship, and psychiatric disturbances.

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