Endometriosis-associated pain syndrome: a nurse-led approach

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Abstract

Endometriosis is an enigmatic disease and its fundamental cause is still unknown. Endometriosis-associated pain syndrome is a common problem; it is underdiagnosed and patients suffering from the syndrome are rarely seen in specialist pain clinics. The correlation between the extent of the disease and pain is weak. Endometriosis-associated pain syndrome may be cyclical or persistent and the pain may radiate to other pelvic organs. Optimum treatment is timely intervention using a multidisciplinary approach.

Keywords

Chronic pain, pain, pain management, visceral pain, pelvic pain, endometriosis, hyperalgesia

Introduction

This October marks the International Association for the Study of Pain (IASP) Global Year against visceral pain. Amongst all the pain conditions, visceral pain is one of the most common reasons for consulting medical professionals, yet very little is understood of the mechanisms and aetiology underlying this type of persistent pain, which encompasses a variety of organs within the pelvic and abdominal areas.

The aim of this article is not to cover the established definitions of chronic pain or the new nomenclature of chronic pelvic pain, which is well covered in the new axial pain structural classification of the European Association of Urology (EAU).¹ Rather it is aimed at looking at the pathway and treatments of a chronic persistent pelvic pain syndrome. The article aims to outline a multidisciplinary approach aimed at functional improvements. One particular condition will be examined and broad brush strokes of the general concepts we use in our urogenital and visceral pain department will be given. Our pathway for patients with endometriosis-associated pain syndrome (EAPS) will also be studied.

Epidemiology

A French study² suggested that one-third of chronic pelvic pain in females is attributable to endometriosis

but further American studies and other reviews suggest a much higher prevalence.³ Although it is a diagnosis that many physicians are well aware of, there is a paucity of knowledge in the public domain of its aetiology, symptoms or treatment options and even more so with regard to the pain associated with endometriosis.⁴ This leads to a delay in the diagnosis and treatment.⁵

Patterns of referral in the UK reflect the fact that the majority of women who consult their general practitioner are not referred on to a specialist, despite numerous presentations with pelvic pain: 28% of women did not receive a diagnosis during 3 to 4 years of follow up after the first consultation and 60% of women had no evidence of a specialist referral. Women seen in secondary care for chronic pelvic pain are a highly selected group and are likely to represent only the tip of the iceberg.⁶

Multiple studies^{5,7,8} highlight the benefit of a multidisciplinary approach to the management of chronic

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pelvic and perineal pain however there is a scarcity of information regarding the structure of such a service.

Hurd⁹ suggested in 1999 that chronic pelvic pain and endometriosis are two significant perplexing problems in gynaecology, and that endometriosis might not be the cause of their pain; however, his paper goes on to suggest three criteria for the diagnosis of endometriosis: first, that the pelvic pain should be cyclic because endometriosis is a hormonally responsive disease; second, endometriosis should be diagnosed surgically; and, third, medical or surgical treatment of endometriosis should result in prolonged pain relief.

We have come a long way in our understanding of endometriosis-related pain in the last decade and now know that these common fallacies are unhelpful and indeed not reflected accurately in this cohort of patients.

There is evidence from the 1990s that endometriosis staging in the current classification was not related consistently to pain symptoms.¹⁰

A prospective German health insurance study following up patients over 4 years showed that only 7.5% of patients with the symptoms ascribed to endometriosis actually had surgical evidence of endometriosis subsequently, and thus symptoms are of limited predictive value.¹¹

A large 5-year Australian¹² exploratory study suggested that there might be an associated risk of endometriosis for those women who have worked as a flight attendant, service station attendant or health worker, particularly a nurse. However other findings¹³ fail to support the presence of a unique psychological profile or even a disproportionate psychological disturbance in women with chronic pelvic pain due to endometriosis; in addition, no differences were obtained for ratings of depression, anxiety, mood factors or additional personality traits. These data suggest that, in general, when psychological disorders are observed in chronic pelvic pain patients, they most likely reflect the effects of chronic pain rather being causative of it.

Despite its prevalence, there is no optimal treatment for endometriosis; recurrence of the disease is a common problem. Laparoscopic surgery shows improved patient satisfaction outcomes in general health, quality of life and emotional wellbeing compared with medical therapies.¹⁴

Most patients developed adhesions after radical surgical excision of endometriosis for pelvic pain.¹⁵ The high incidence of adhesion formation after surgery for endometriosis emphasises the importance of optimising surgical techniques to potentially reduce adhesion formation.¹⁵

Intra-abdominal adhesions are accepted as aetiological factors for infertility and other physical manifestations of secondary endometriosis; however, the

contribution of adhesions to pelvic pain is less clear. The most common laparoscopic findings in patients both with and without pelvic pain were endometriosis and adhesions. Multiple adhesiolysis techniques have been employed, with the outcome of surgical procedures ranging from no pain relief to pain relief in 90% of patients. However, randomised trials have shown that adhesiolysis is ineffective in improving the outcome of the treatment of pelvic pain, possibly because of adhesion reformation.¹⁶ The health-related quality of life in women is only partially restored by a combination of medical and surgical treatment.¹⁷ Interestingly, adhesions are usually not described as an aetiological factor for pelvic pain in men; this might be related to a gender difference in pain perception or the possibility that adhesions per se do not cause pain.^{4,18}

Pathogenesis

Pain of any type is processed in nervous system activity. Rodent research¹⁹ suggests that a major contributing factor for endometriosis pain is not the ectopic growths themselves, but sensory and autonomic nerve activity from nerves that have sprouted from nearby tissues to innervate the growths and affect activity of neurons in the spinal cord and brain.

Another hypothesis is that lesions may produce pain by compressing or infiltrating nerves near lesions, but it does not explain pain in situations in which nerves are not near lesions. Indeed, pelvic pain is not correlated with nerve fibres in adhesions or within endometriomas.

Importantly, endometriosis lesions must be vascularised to attach and survive.²⁰ Blood vessels are innervated by sensory and sympathetic fibres; thus when blood vessels branch to vascularise developing lesions, termed angiogenesis, nerves innervating those blood vessels may also branch (neural sprouting), thereby enabling nerves to invade lesions.

Zhang et al²⁰ suggest that endometriosis is a neurovascular condition much like headache, a concept that was also suggested clinically.²¹

Certainly here, as in other chronic pain type mechanisms, a combined complex circuitry of peripheral and central sensitisation mechanisms are in play.

Visceral pain is unique in that not all pain that is evoked is entirely linked to visceral injury, and the pain can be referred to other locations, is diffuse and poorly localised.

Prolonged noxious stimulation of the viscera, for example in a distended bladder, which is normally not a painful stimulus, can evoke increased excitability of viscerosomatic neurones in the spinal cord and subsequently cause pain. Once triggered, this central sensitisation is sustained despite the termination of noxious

input, demonstrating that pain may be experienced even in the absence of peripheral noxious stimuli.²² Specifically, these events are known to occur within the dorsal horn of the spinal cord and culminate in a process termed spinal sensitisation.^{23,24}

This establishes central hypersensitivity whereby normal sensory stimuli, in a magnified form, are perceived as pain. This may also result in muscle hyperalgesia, as muscles are closely related to viscera and the nerves. There is also an implication of chemical changes, for example in the central neuromodulator *N*-Methyl-D-aspartate.⁷

There is also evidence that painful endometriosis can be classified as a mixed inflammatory and neuropathic pain condition²⁵ or a neurovascular condition,²⁰ both of which open new avenues for pain relief.

There is a lot of evidence in the literature to suggest that a combination of medical and surgical approaches to some aspects of pain associated with endometriosis works up to a limited ceiling.²⁶ This is a reflection of the complex circuitry involved in the pathogenesis of pelvic pain, as discussed above. A common summary to most literature regarding treatment options for any persistent pain syndrome is that a multimodal treatment option is advocated.²⁷ In an extensive literature search the authors did not find an account of how this was currently facilitated in a centre from a patient perspective.

Patient pathway

In this section a new nurse-led pathway for patients with EAPS will be described. The assessment process will be used as a framework to explain interventions and referrals; in practice, explanations and referrals are discussed at the end of the consultation.

Patients are referred from the hospital's endometriosis service usually when active treatment for endometriosis has been completed and, in the opinion of the gynaecological endometriosis team, there are no further surgical interventions yet the pain is persistent, or when pain appears unrelated to lesions. These referrals are triaged to be seen by clinical nurse specialists (CNSs) who specialise in urogenital pain management.

Patients with pelvic pain, dyspareunia and dysmenorrhoea often find it gratifying to be given a diagnosis of endometriosis, as they feel that a cause has been found for their pain, and that this cause has a viable and recognised treatment option, which is removal of endometriotic lesions, and the expectation is that excision will relieve pain.²⁸

Counselling prior to laparoscopy is important to enable understanding of the fact that the primary function of surgery is confirmation of endometriosis, and to allow surgical treatment of the lesions, and that a

laparoscopy is not the diagnostic modality for relief of pelvic pain.

There are many aetiologies of pelvic pain that present with symptoms resembling those of EAPS²⁹ that are not diagnosable with laparoscopy, such as interstitial cystitis and irritable bowel syndrome. In fact, the pain-related diagnoses that are amenable to and possibly require a laparoscopy are quite limited. Howard²⁹ would argue that diagnostic laparoscopy in modern gynaecology has a limited, if any, role and that, when laparoscopy is planned for women with chronic pelvic pain, it should be with a very high suspicion of a diagnosis and with plans to treat the disease operatively.

It is unfortunate that many women are left with the belief that, if a laparoscopy fails to provide a diagnosis of a pain generator or excision of the lesions does not remove the pain or it returns within a few months, then it means the pain is in her head or, to employ a term often used by clinicians, 'supratentorial'.

The pain encompasses and impacts their relationships both social and intimate; they may be on the verge of unemployment or already unemployed. It is not uncommon for these patients to have been investigated by multiple specialists who, after extensive expensive procedures, have told them that their pain is psychosomatic as they do not have any active lesions, and they may also have been labelled as drug or attention seeking.

The CNS in the EAPS clinic provides a faster route to initial treatment and this is essential for this group of patients as, if they are managed correctly, they can stay in jobs or get back to work sooner. If managed poorly they could well bounce around the healthcare system and have yet more expensive unrequired investigations, which may lead further into a never-ending cycle of medicalisation, increase their pain and lead to the patient becoming further exasperated.³⁰

Nurse-led service for EAPS

The CNS-led clinics run at the same time as the consultant clinics; patients are discussed after assessment but prior to presentation of treatment options. This pathway aims to reduce the long waiting lists that are common in our specialist urogenital pain clinics.

While there is evidence in the literature that supports the efficacy of nurse-led pain management programmes³¹ there is a dearth of literature regarding CNS-led management of patients with EAPS.

Ryan³² showed that in a nurse-led clinic for patients with fibromyalgia the mean number of hospital appointments fell significantly in the first, second and third years and 78% of patients reduced their general practitioner visits in the first year. They concluded that having nurse-led pain clinics can allow patients access

to appropriate pain management strategies at an earlier stage in their conditions.

Managing pelvic pain patients with a timely multidisciplinary approach appears to be acknowledged as an ideal approach but it is expensive³³ and resource heavy, and services are rare; however, when weighed against the cost for repeated referrals resulting in need-less procedures it is money well spent.³⁰

This is supported by an old study that found that patients attending a multidisciplinary pain clinic are nearly twice as likely to return to work,³⁴ though it should be noted that this study looked at back pain and was methodologically poor. A more recent study of patients with neuropathic pain found improvement in quality of life outcomes and anxiety by application of a multidisciplinary clinic approach; however, there were acknowledged methodological errors in this study.³⁵

In a specific neuropathic multidisciplinary pain clinic³⁶ improvements in sleep, reductions in medication use and reductions in healthcare resource use were observed; however, pain severity only decreased after the 1-year follow up, whereas quality of life indexes and anxiety improved after 6 months.

Required training for CNS

The nurses are educated to masters level in pain, are experienced in general pain management and have four years' of experience in the multidisciplinary urogenital pain management clinics; the development of the role of the nurse specialist in these clinics is dependant on their expertise.³⁷

The consultation

The style of the consultation is a key element to the initiation of treatment, which is detailed below.

A thorough history is taken, after which the patient is provided with a diagnosis and comprehensive explanation. The mechanisms and reasons for their pain are explained and discussed along with an explanation for cessation of active treatment. Their ability to take on board the functional aspects of treatment hinge on an understanding of muscle hyperalgesia and the central sensitisation model.

Where necessary, the patient is referred to pain management physiotherapists and pain management psychologists for individual sessions covering pacing, tolerance, mood management and muscle training. This may also be delivered in a unique gender-specific pelvic pain management programme.

The consultation is 45 minutes and patients are given time to tell their story. They have often been told

that their pain is in their mind as all the active disease has gone and they do not understand why they still have pain. A detailed history is taken from the patient, not from the clinic letters – it is important for these patients to feel heard.³⁸ Patients are encouraged to describe what they think is the cause of their pain. It is accepted that this improves the clinician–patient relationship.³⁹

The initial lengthy consultation starts the process of moving the patient from thinking about EAPS as being a lesion that can be removed to regarding it as a chronic disease process that is recognised and managed,⁴⁰ and shifts the patient's orientation to the problem of ongoing pain. Over time the aim is to help the patient to give up the relief of pain as their goal and entertain alternative means of realising their hoped-for goals. This may be by developing a new aspect of their hoped-for selves that matches their core values or by modifying their goals.⁴¹

EAPS patients may present as very distressed as their hoped-for futures are blocked by persistent pain. Their distress may manifest as relentless searching for a cure, which has been observed as 'doctor shopping', which at best results in no abnormal findings and may result in further procedures.⁴²

Example case

History

AH is 38 years old, is nulliparous, is a TV producer, works nights and lives with her partner and they are keen to start a family using fertility treatment.

Site of pain

AH complains of right iliac fossa and central pain. Her central pain starts from below the umbilicus and goes through to her back but not into the vagina or down her legs. The pain is in the right side of her pelvis and is much worse when her bowel is full, and her central pain is worse when her right iliac fossa pain is worse. This is the phenomenon of visceral interaction and is demonstrated elegantly in a study by Giamberardino et al.⁴³

Onset and history of pain

The central pain started in 2009 after an investigative hysteroscopy for a long-term and persistent discharge; this did not reveal any specific uterine pathology. The pain improved slightly after an elective laparoscopy right salpingectomy with adhesiolysis and treatment for endometriosis in October 2010. The pain then increased until May 2011 when she had further elective laparoscopic treatment to endometriosis lesions and left salpingectomy for hydrosalpinx. The pain was reduced for

about 3 months, after which it began to increase again. It is documented that any further endometriosis surgery would be unlikely to lead to significant improvement. The right iliac fossa pain started about 18 months ago and does not appear to have a precipitating cause, though she has always had a tendency towards constipation that she feels was exacerbated by working nights.

Patients are educated about central sensitisation and how their pain cannot be seen on scans but this does not mean their pain is not real.⁴⁴ In the case of AH she was keen to understand pain mechanisms in depth and why surgery can increase pain by providing further insults to the nervous system, which in turn increase the central sensitisation.²³

It is important to pick out and explain what is a peripheral generator and describe how this has been treated by the endometriosis team, and then to describe what elements of the pain are centrally mediated and explain the neuropathic pain pathways and involvement of muscles, if any; this is then related to treatment options.

Pain frequency

AH described how her central pain is constant for most of the month but also how she can have 1 or 2 days pain free per month, but these are unpredictable and do not seem to have any relation to activity level; this is a common occurrence in chronic pelvic pain.

She found her pain was increased by a full bowel, and, as she only partially emptied her bowels once every 3 days, this was frequent. Visceral hyperalgesia is a common finding in chronic pelvic pain because of visceral-somatic convergence, whereby cross-talking can also cause functional abnormalities or pain in other organs such as the bladder and bowel.^{45,46,47}

These are complex concepts for the patient to comprehend and require skill and empathy to simplify and distil into meaningful messages.

Further previous treatments

The patient had a pelvic ultrasound, in December 2011, that showed that there is adenomyosis evident in the myometrium and both ovaries are adherent to the side wall and posterior uterine wall, with scarring in the pouch of Douglas. She had a Mirena intra-uterine system fitted, in February 2012 for severe endometriosis, adenomyosis, pelvic pain and irregular bleeding, which had a positive effect on her symptoms. There is evidence that the sex hormones have an effect on both pain perception and nociception,^{48,49} and AH is consistent with other EAPS patients in that she experiences a flare up with her period.

In March 2012 AH had a magnetic resonance imaging proctogram which showed no specific abnormality, reasonable evacuation function with global pelvic floor weakness, some trapping and a 2.5 cm rectocele. Although this could cause some of her defecation problems, it was not thought to be the cause of all of her pain. She was prescribed biofeedback, which is proving to be an effective treatment option. It is not unusual to find that a patient with ERPS has poorly functioning pelvic floor muscles; on examination it is often found that their muscles are tender and sore.

She finds that hot water pads and baths relieve her pain, as does walking, but increased exercise exacerbates the pain; this is consistent with a muscular, nociceptive pain.

Urological history

Patients with EAPS may report bladder symptoms including urgency;⁵⁰ however, AH had an unremarkable urological history. She has always had a frequency of voiding during the day but does not get up in the night even if awake: the frequency is not associated with pain; she does completely empty her bladder and she does not experience hesitancy or incontinence.

Medications

She currently takes tramadol, which increases her constipation, and naproxen, which makes her wheeze; she has never tried any neuropathic pain medications.

The European Association of Urology¹ advocate the use of neuropathic agents such as amitriptyline, gabapentin and lidocaine, which are aimed at reducing the effects of central sensitisation in the same way as is observed for other neuropathic pain states.

In accordance with the EAU guidelines, we suggested gabapentin be prescribed by the general practitioner; amitriptyline was considered but owing to a potential increase in constipation nortriptyline was suggested as a possible alternative, as per the National Institute for Health and Clinical Excellence guideline.⁵¹ AH was given information leaflets about possible side effects and dose increases; she will be telephoned after 6 weeks to assess medication response. She was advised about medications and fertility treatment.

If patients are taking opioids they are advised to reduce their usage and change to a moderated release preparation as per the British Pain Society guidelines.⁵² Patients who are taking high doses of opioids will have their sex hormone levels measured by their general practitioner.⁵³

Impact of pain

The pain limits her ability to work: she took redundancy 8 months ago. After the initial assessment and prior to the follow up telephone consultation AH contacted the department. She stated that she felt less tearful and that with the support of the multidisciplinary team and the beneficial effect of neuropathic medications she was planning a graded return to work.

Cognitive – thoughts about the cause of pain

AH feels that the pain was caused by the endometriosis and exacerbated by the subsequent surgeries, and maintained by the stress of her job.⁵⁴ She is not seeking further surgery and is keen to apply a biopsychosocial approach.

Behaviour

Sitting and lying do not increase her pain, standing exacerbates it after a period of time and walking can help in small amounts, although too much can make the pain worse. AH was supplied with information regarding graded increase and pacing and referred to pain management physiotherapy.

Sexual history

She has an unremarkable sexual history and no incidents of negative sexual encounters, abuse or rape. Negative sexual encounters are not a causative factor but need to be addressed during consultation as abuse may predispose patients to pelvic pain.^{55,56} All patients are screened for sexually transmitted diseases prior to this appointment.

Her pain was not increased after orgasm and she did not have dyspareunia; however, she had developed an avoidance of intimacy when her mood was low, which had not recovered, and it was now becoming a habit. This was also linked with fertility issues and was affecting her feelings of self-worth. We discussed the importance of intimacy in an adult relationship;⁵⁷ she took a reading list but was not referred to the pain management psychologists.

Social history

AH is a non-smoker and has not drunk alcohol since this pain started. She does not socialise with friends any more as she finds it embarrassing to say that she has pain and bowel problems; she feels that friends do not want to see her if she cannot function at the same level as before; she finds it hard to describe the pain without a diagnosis. Her diagnosis of EAPS was discussed and

she was challenged on her thoughts about her friends – strategies regarding restarting socialising were explored.⁵⁸

Follow up

AH was called 8 weeks after her initial appointment; she had received one session with the pain management physiotherapist and was benefiting from gabapentin. She had just started back at work part time and the ongoing treatment with the biofeedback team was proving to be helpful for her bowel.

Conclusion

This patient's experience reflects that of the majority of our patients who come to our specialist clinic as a last resort and feel hopeless. We find that our approach gives patients a framework of functional improvement whereby they have a readily accessible scientific explanation but also the support of a multidisciplinary approach to enable those very important functional improvements to be made in tandem.

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