Chronic pelvic pain in women

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ABSTRACT

Chronic pelvic pain is a major public health problem for women throughout the developed world. The complex innervation of the pelvis and the anatomical proximity of pelvic viscera mean this symptom frequently overlaps traditional medical specialties, leading to diagnostic delay and frequently inadequate treatment. Careful history taking and examination can in itself be therapeutic and will likely identify a number of causal and perpetuating factors which should be managed within the context of a multidisciplinary clinic.

Chronic pelvic pain (CPP) is a major public health problem throughout the developed world. It is as common as asthma and it, or its sequelae, impact on all areas of a woman's life. However, diagnosis is often difficult and delayed, leading to frustration and dissatisfaction for both the woman and her doctor.

CPP is a symptom, not a diagnosis, and is defined by the Royal College of Obstetricians and Gynaecologists (RCOG) as "intermittent or constant pain in the lower abdomen or pelvis of at least 6 months' duration, not occurring exclusively with menstruation or intercourse and not associated with pregnancy".[1] Because of the complex innervation of the pelvis and the anatomical proximity of pelvic viscera, this symptom frequently overlaps traditional medical specialties and can present to primary care or to a variety of specialist clinics, including gynaecology, gastroenterology, urology and pain medicine. The aim of this review is, therefore, to provide an overview of the common causes of CPP, including some which are less well known but easily treated and, in the context of recent research, to suggest a rationale for investigation and treatment.

EPIDEMIOLOGY

It is difficult to ascertain a true prevalence of CPP. Many women do not seek help, accepting the symptom as part of being female. Furthermore, definitions of CPP vary, making it difficult to interpret the data that do exist.

The annual prevalence of women aged 15–73 years old presenting with CPP to primary care in the UK was found to be 38/1000 (comparable to asthma (37/1000) and back pain (41/1000)).[2] These rates varied with both age (lower in 15–20 years old and >60 years old groups) and region (lowest in Scotland, highest in Wales), likely reflecting both demographic variations in the populations studied and differences in health seeking behaviour. A postal survey to a randomly selected cohort of women[3] obtained a 74% response rate (2016 women), of whom 24% had experienced CPP in the previous 3 months. However, excluding ovulation related pain reduced this to 16.9%. One third of these women reported that their pain started more than 5 years earlier and 25% did not have a diagnosis after 3–4 years. Thus a long symptom duration is likely to contribute to the high prevalence.

Similar figures have been obtained from epidemiological studies in other countries. In New Zealand, only 34% of a random sample of women aged between 18–50 years reported no pelvic pain, with 25.4% reporting CPP,[4] while in the USA CPP was reported by 14.7% of women of the same age range.[5] These authors also looked at the economics of CPP, estimating outpatient medical costs of $881.5 million per year. Moreover, 15% of their cohort reported work absenteeism and 45% reduced productivity. These estimates do not take into account the cost to the woman and her family (both financial and emotional) of being unable to fulfil her many other roles, such as being a wife and mother.

THE ROLE OF THE CENTRAL NERVOUS SYSTEM IN THE DEVELOPMENT OF CHRONIC PAIN

Acute pain is useful, as it heralds actual or potential tissue damage and motivates a response that removes the organism from this threat. In many chronic pain conditions, however, pain persists in the absence of continued tissue damage. Repeated or prolonged noxious stimuli are able to upregulate the nervous system at a number of sites—peripheral nerves, spinal cord and the brain/brainstem—such that painful sensations become more painful (hyperalgesia) or previously non-painful sensations (such as light touch) are perceived as painful (allodynia)[6] (fig 1). Additionally in the viscera, "silent afferents" (which previously did not send signals) are thought to be recruited after noxious events which contribute further to amplifying the painful signal.[7]

The innervation of the pelvis is complex, with both convergence and divergence at the level of the spinal cord. Thus, incoming nerves extend one or more segments both rostrally and caudally, while nerves from more than one spinal segment supply each pelvic organ, as well as abdominal and pelvic musculature and skin. These features contribute to the poorly localised, diffuse sensations that characterise visceral pain, making it hard for both the patient and her doctor to say with certainty which organ is causing the pain. Central processing leads to both viscero–visceral and viscero–somatic referral,[8] such that although the original pathology may have been in one organ, symptoms can subsequently be generated from a number of sites, explaining the commonly seen triad of dysmenorrhoea, irritable bowel syndrome (IBS) and interstitial cystitis (IC). Visceral hyperalgesia can also

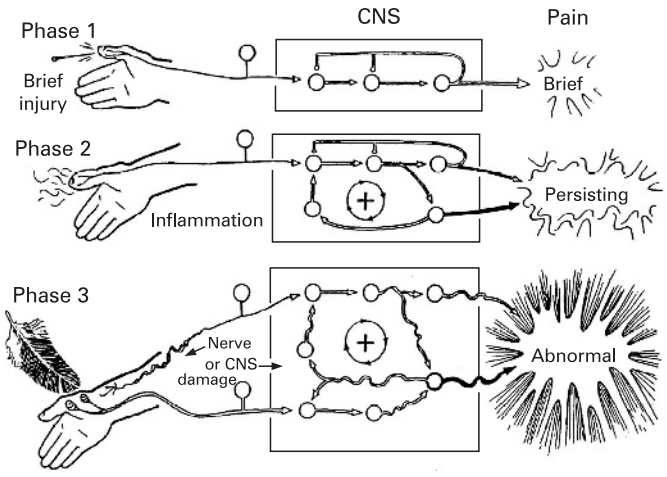

Figure 1 Peripheral and central sensitisation. Phase 1 represents a normal response to acute pain. With persistent noxious input sensitisation occurs, resulting in hyperalgesia (phase 2). With damage to the nerve or central nervous system (which can be the result of repeated noxious stimuli) allodynia occurs, as is shown in phase 3. CNS, central nervous system. Reproduced with permission from Cervero and Laird.[6]

occur and has been demonstrated in a number of visceral pain conditions where no obvious pathology can be found, including IBS[9] and IC[10] (now also known as painful bladder syndrome, PBS).

Current expert opinion considers that chronic pelvic pain can present anywhere along a spectrum from organ specific (for example, IC), to regional (CPP) to systemic pain (for example, fibromyalgia).[11] It is likely that repeated painful episodes will encourage progression along the spectrum, although movement in the opposite direction or resolution of symptoms can also occur at any point.

ASSOCIATED FACTORS

A number of factors are thought to be associated with CPP and should be explored at an appropriate point during the consultation.

Hormonal variation

By definition, dysmenorrhoea is cyclical; however, symptoms from a number of other painful conditions including IBS,[12] IC,[13] temporomandibular joint dysfunction,[14] and fibromyalgia[15] also vary with the menstrual cycle. In the majority, pain reports appear to be highest at times of low or rapidly falling oestrogen levels. Sex steroid hormones are known to act at multiple sites throughout the body, including the peripheral and central nervous system, and therefore may affect the pain experience both locally by altering pathology and centrally by affecting pain perception. Thus symptoms which show cyclical variation may be amenable to hormonal treatment even if they are not obviously "gynaecological" in origin.

Social

There is no variation in the prevalence of CPP across social class or with marital or employment status.[3] However, social support can be an important factor in how a woman deals with her pain and social isolation can exacerbate the situation. Whether the opposite situation of the overprotective partner or parent makes recovery less successful, as is suspected, remains to be demonstrated scientifically.

Abuse

Although often alluded to, the relationship between physical or sexual abuse and CPP is still not clear. The majority of studies are retrospective and only target women who have already developed CPP.[16] In secondary care, women with any chronic pain condition are more likely to report a history of childhood abuse than pain-free women, while sexual abuse is more commonly reported in women with CPP than other pain conditions.[17] However, childhood sexual abuse may purely be a marker for the development of depression, anxiety and somatisation which predispose to the development of CPP.[1] In a rare prospective study[18] children who had been abused were followed up until their 20s and were not found to have an increase in medically unexplained symptoms when compared to a population who were not known to have been abused. However, those with unexplained symptoms were more likely to report their abuse. Thus a revealed abuse history should not be assumed to be the cause of the pain, but failure to respond to treatments should perhaps prompt an exploration of these areas if a good therapeutic relationship already exists.

Psychological

It is known that women with CPP display an increased incidence of "negative" psychological features, such as depression, anxiety and catastrophisation.[19] This is in common with other chronic pain conditions such as fibromyalgia and IBS. However, it is not possible to know whether these factors predispose a woman to develop CPP, contribute to a perpetuation of the pain, or are a consequence of years of living with pain and attempts to justify its severity or even existence to friends, family and health care professionals. What is known is that psychological state can alter the experience of pain, and this is the area that should be emphasised when a referral to a psychologist is suggested. Improving sleep alone can both improve mood and have a significant effect on the person's ability to function.

Personality

Similarly, it is not known whether personality types predispose to the development of chronic pain conditions or merely alter the way in which they are dealt with. Some personality traits can make recovery more difficult—for example, driven types can find it hard to pace themselves, while those who take easily to the "sick role" may be difficult to engage in therapeutic options. Women with specific diagnosed personality disorders should be managed in combination with a psychiatrist.

CAUSES OF CHRONIC PELVIC PAIN

Pathology in a number of different organ systems can cause pain which is felt in the pelvic region, as can be seen in table 1. A detailed discussion of each of these is beyond the scope of this review; however, a few deserve a brief discussion here, either because they are so common or because they are easily treated but frequently missed.

Endometriosis and adenomyosis

Ectopic endometrium either outside the uterus (endometriosis) or within the myometrium (adenomyosis) is a common cause of pelvic pain in women. Definitive diagnosis of endometriosis requires a diagnostic laparoscopy,[20] while ultrasound or magnetic resonance imaging (MRI) can be used to identify adenomyosis, though neither with 100% sensitivity.[21] The two conditions commonly coexist and respond to similar medical

Table 1 Causes of chronic pelvic pain in women

Gynaecological	Gastrointestinal	Urological	Musculoskeletal	Neurological
Endometriosis	Irritable bowel syndrome	Intersitial cystitis	Fibromyalgia	Nerve entrapment
Adenomyosis	Constipation	Painful bladder syndrome	Trigger points	
Adhesions	Inflammatory bowel disease	Urethral syndrome	Pelvic floor abnormalities	
Chronic pelvic inflammatory disease			Hernias	
Pelvic venous congestion			Sacroiliac joint dysfunction	
			Piriformis syndrome	
			Disc disease	

treatments.[22 23] The extent of endometriosis found at laparoscopy correlates poorly with symptoms and the lesions may have been an incidental finding, with an entirely different pathology being the cause of the pain. Thus a previous diagnosis of endometriosis should not prevent a detailed history and examination being performed. On the other hand, symptoms typical of endometriosis but with a negative laparoscopy may well be explained by the presence of adenomyosis and empirical hormonal treatment is entirely appropriate.

Adhesions

Adhesions are a common finding in women with and without pelvic pain. They form after trauma to the visceral or parietal peritoneum and thus can be secondary to surgery, infection and endometriosis. Between 70–85% are thought to occur after surgery.[24] The relationship between adhesions and pain is still unclear. It appears that there is no benefit of adhesiolysis over diagnostic laparoscopy alone[25] except in women who have dense, vascular adhesions involving the bowel.[26]

There are, however, two distinct cases where adhesions are known to cause pain: trapped ovary syndrome and ovarian remnant syndrome. In the former, a retained ovary becomes trapped in dense adhesions after hysterectomy, while in the latter a small piece of ovary is unintentionally left behind at oophorectomy and again becomes trapped in adhesions. In both these cases surgery is likely to be of benefit, but will not be without risk because of the distorted pelvic anatomy.

Trigger points

A trigger point (TP) is a discrete, focal, hyperirritable area in a taut band of skeletal muscle. The exact aetiology of TPs is unknown, but they can develop from overuse of a muscle (for example, abnormal posture, stress related), persistent low grade inflammation and repeated noxious neural stimuli from a referral viscera as occurs in adenomyosis. Pressure on the TP causes referred pain and is often associated with an unpleasant feeling and nausea.

TPs are frequently found in abdominal and pelvic floor muscles causing or exacerbating both CPP and dyspareunia. The continued presence of a TP can explain an only partial response to treatment of the underlying pathology and is an indication for a careful re-examination of the patient at her follow-up visit. There is currently no consensus on the management of TPs and this therefore depends on the practitioners' skills and resources. Treatment options include TP release by direct pressure, dry needling or injection with local anaesthetic. Stretching and gentle exercise programmes should then be employed to prevent the TP reforming.[27]

Pelvic floor abnormalities

Unilateral or bilateral pelvic floor abnormalities can cause CPP, dyspareunia, perineal pain and dyschezia yet are frequently overlooked. They can be secondary to postural alterations caused by pain or other musculoskeletal conditions; viscero-muscular referral patterns; or trauma as occurs during childbirth or certain surgical procedures. In a woman with dyspareunia, demonstrating that pressure on a tender, tense pelvic floor muscle recreates her pain during intercourse can help towards relieving concerns about her reproductive organs. Good responses to treatment are frequently obtained from physiotherapy and recent studies on the injection of botulinum toxin (botox) into the pelvic floor muscles have shown promising results.[28]

CLINICAL ASSESSMENT

History

The initial assessment of a woman with CPP is very important, with complete recovery at follow-up being associated with a favourable patient rating of the initial consultation.[29] The woman needs to be given time to tell her story, without interruptions, but with the support of whoever she would like to be present (which may be no-one but the doctor). Although time is difficult to provide in modern healthcare settings, especially primary care, extra time taken at the first consultation to listen to the history in the patient's own words is invaluable. Important information about the context of the pain, its effects on her life and her beliefs about its cause and prognosis are more likely to be gleaned when she is allowed to tell her story in her own time. One recent study showed an explanation for the pain to be one of the things women with CPP most want out of their consultation (box 1),[30] and the process of telling her story and of the examination can in itself be therapeutic. If the woman's expectations of the consultation can be elicited, this can help direct the consultation and provide a context for the plan of investigation and management. The speciality of the doctor who first assesses the woman will likely depend on the predominant presenting symptoms; however, wherever possible, this should be someone with a specific interest and thus expertise in this difficult area. If more than one speciality becomes involved it is important that the management package as a whole is coordinated by one individual. In the UK this is likely to be the role of the general practitioner but may be undertaken by another specialist elsewhere.

A detailed history of the pain should be taken including its associations, such as with bowel, bladder and psychological symptoms and the effects of posture and movement. Cyclicity of symptoms or exacerbation with intercourse should also be enquired about. As always, a comprehensive medical, drug and family/social history should also be obtained. A history of past or present abuse (verbal, physical or sexual) may also be present; however, it is often not appropriate to discuss this at the first consultation. If abuse is revealed, these experiences need to be accepted as stated and it is important to know where to access specialist help locally should this be required.[1]

Box 1: What women want out of a chronic pelvic pain consultation[30]

- Personal care
- To be understood and taken seriously
- Explanation
- Reassurance

Examination

Likewise, the examination requires more time than is usual. It is at this time that the patient is most vulnerable and new information is often revealed during examination.[31] The decision as to whether or not to have a chaperone present is a personal one, that will depend upon both the doctor's and patient's wishes as well as local recommendations. The presence of a third person, however, may alter the dynamic and prevent information being revealed.

Examination should begin as always with observation, including evidence of skin alterations or damage and posture. Both the patient's attitude to the examination and the doctor's response to this should also be noted. For example, detachment from the examination can be reflected back to the patient who may then reveal a general detachment or disgust with this part of her body.

Evidence of altered sensation (hypersensitivity or allodynia) should be looked for before abdominal palpation is performed. If musculoskeletal pain is suspected, the effect of movement should also be assessed.[32]

The extent to which an internal examination is performed will depend on the history. With pronounced vaginismus, anything more than a gentle one finger examination may be inappropriate. Again altered sensation on the vulva and perineum should be looked for and pelvic floor muscle tone assessed if possible. Rectal examination should only be performed if there is a clear indication in the history.

Investigations

Investigations should be guided by the history but care should be taken to avoid over-investigation initially. In many cases these women have already seen a number of doctors, of many specialities, and endured a variety of frequently invasive investigations. A detailed review of the notes and the results of past investigations may well be more productive than arranging new investigations.

Asking the woman to keep a detailed pain diary over 1–2 months can be particularly helpful. This can reveal information about both the timing of the pain and its associations to the doctor and the woman herself.[1] If symptoms are clearly cyclical (or show cyclical exacerbations) a therapeutic trial of a gonadotrophin releasing hormone analogue (GnRHa) should be considered before a laparoscopy is performed.[1]

A laparoscopy should be considered if no relief is gained from a therapeutic trial or if there are other indications such as subfertility or a pelvic mass. However, laparoscopy is not without risks, with large series quoting approximately 3% risk of minor complications and 0.6–1.8/1000 risk of major complications such as bowel perforation and vascular damage.[33] Furthermore, a negative laparoscopy is not always reassuring to the woman,[34] and may reaffirm her beliefs that the doctors do not believe her and think the pain is of psychological origin.

Management

As a number of factors are usually involved once the pain has become chronic, management should target each identified area, addressing both perpetuating as well as causative factors. Ideally, this should be undertaken within a multidisciplinary team in discussion with the patient. Treatment is more likely to be successful if she understands the rationale behind the plan and if it fits within her own belief system.

Analgesia

Whatever other strategies are put in place, it is important that pain relief is addressed at the first appointment. The patient may already have been prescribed analgesics and/or may self medicate with over-the-counter preparations. An analgesic ladder should be used to determine appropriate pain relief; however, non-steroidal anti-inflammatory drugs (NSAIDs) are often particularly helpful. If opiates are used, laxatives should be prescribed concurrently to prevent constipation which can exacerbate pelvic pain. Pre-emptive analgesia should be considered for predictable cyclical exacerbations and may prevent emergency admissions. Women who opt for analgesia (as opposed to hormonal treatments) because of a desire to conceive should be advised that the use of NSAIDs mid cycle may inhibit ovulation.[35]

Drugs traditionally considered treatments for neuropathic pain, such as amitryptiline and gabapentin/pregabalin, can also be useful adjuncts, especially if the pain is described with words such as burning, stabbing and shooting. If altered sensation is demonstrable, daily application of topical capsaicin to abdominal (but *not* vulval) skin may help to desensitise the area.

Non-pharmacological treatments such as acupuncture, TENS (transcutaneous electrical nerve stimulation), chiropractic and osteopathic manipulations may be beneficial, and pain management techniques and support groups can also be of value.[36]

Hormonal treatments

Pain generated by many organs can show cyclical variation and may respond to hormonal treatment (for example, IBS[37] and IC[38]). The appropriate choice of preparation should be made in discussion with the patient. Cultural beliefs or general misunderstandings about menstruation may prevent compliance with regimens with induce amenorrhoea. For many women tricycling or continuous use of the combined oral contraceptive pill can be successful with minimal side effects, while others are more comfortable with a progesterone only preparation. If uterine pathology such as adenomyosis is suspected or if menorrhagia is also a problem, the levonorgestrel releasing intrauterine system (Mirena) can be extremely effective.[23] In young, nulliparous women a brief general anaesthetic may be required for insertion.

An alternative approach is to use a GnRHa to medically and reversibly inhibit ovarian function. These drugs (given as monthly subcutaneous injections) cause a prolonged activation of the GnRH receptor leading to an initial worsening of symptoms (the "initial flare") followed by a reduction in gonadotrophs, such that by 21 days, serum oestradiol is equivalent to that of a postmenopausal woman and remains so with continued dosing. The most common side effects are hot flushes and emotional symptoms, but these are usually well tolerated if pain is relieved. Of greater concern is the loss of bone mineral density (BMD) which can be up to 6% after 6 months of treatment.[39] If the trial is successful then treatment can continue with the addition of add-back low dose combined

Current and future research questions

- The effects of variations in sex steroid hormone levels on pain perception in both pain-free women and those with a chronic pain condition remains unclear. Well designed studies are necessary to investigate this further.
- Visceral hyperalgesia appears to have a role in chronic pelvic pain (CPP); however, we do not know why this develops or how to treat it once it is established.
- Although a number of factors have been associated with CPP, it is not known whether these are a cause or an effect of the pain. Longitudinal studies are needed to identify subgroups at risk of developing chronic pain. Once these populations are identified, preventive strategies can then be investigated.
- Many units use off-license and novel treatments for CPP; however, further evaluation of their safety and effectiveness is required. Collaboration between units and internationally is likely to be required to facilitate this.

Key learning points

- Chronic pelvic pain is common and has a major psychological, social and economic impact on the patient and her family.
- Alterations in the neurobiology of pain occur when chronic pain develops.
- Many factors are usually involved in chronic pelvic pain. They can be causative or perpetuating factors or develop as a consequence of the pain.
- Non-gynaecological organs can produce cyclical symptoms which may respond to hormonal treatments.
- Musculoskeletal factors are often ignored, but are very common and respond well to treatment.

(oestrogen and progesterone) hormone replacement therapy (HRT). The dose of HRT should be sufficient to treat vasomotor symptoms (thus also maintaining BMD) without stimulating pain or bleeding. This combination has been shown to be safe and effective for up to 2 years[39] (however, the woman should be made aware that treatment for longer than 6 months is an off-license use). Three monthly preparations are available, but do not appear to be as effective as monthly dosing for many women. Beyond 2 years, many women seek alternative management options; however, in those who prefer to continue with treatment there is now evidence from small studies that the combination is safe (and BMD maintained) for up to 10 years.[40]

Physiotherapy

Dysfunction in the musculoskeletal system can be both the primary cause of CPP or secondary to pathology elsewhere. It is surprisingly common, with one retrospective study suggesting that 75% of CPP patients had musculoskeletal abnormalities.[41] It is therefore important that the musculoskeletal system is appropriately assessed and any issues dealt with in order that a good response to treatment occurs. A dedicated woman's health physiotherapist who is able to assess and treat the pelvic floor is an important member of the multidisciplinary team.

Psychological therapy

Psychosocial and psychosexual issues are often important perpetuating factors in CPP. Having the opportunity to explore these issues in a non-threatening environment can both improve the pain experience and help the woman to develop her own pain management plan. If negative psychological features are present then more specific psychological treatments such as cognitive behavioural therapy can be utilised.

Surgery

Patients with a chronic pain condition are more likely to develop postoperative pain[42] and many women with CPP will have had operations previously, increasing their risk of complications. In this group of women, surgery is best thought of as a second line investigation/treatment unless there is a clear indication (such as a pelvic mass) to operate sooner.

For women who attend requesting hysterectomy for their pain, a therapeutic trial of GnRHa is advisable. If this is successful, both the doctor and the patient can be reassured that hysterectomy and bilateral salpingo-oophorectomy (BSO) should also relieve the pain, although, particularly if fertility issues are not yet resolved, medical treatment may also be considered an appropriate interim treatment. On the other hand, if pain persists despite GnRHa treatment, hysterectomy is also unlikely to be successful and the patient can be counselled appropriately and an alternative management strategy sought.[43]

Similarly, for women who have persistent or recurrent pain after hysterectomy with ovarian conservation, response to GnRHa treatment suggests that oophorectomy is likely to be successful.

CONCLUSIONS

Recent research has led to an improved understanding of both the basic science of visceral and chronic pain and of many of the conditions causing pelvic pain. However, time to listen to and explore a woman's story, as well as to perform a careful examination, must be invested in order to make the best use of this knowledge. Although outside the scope of this review, much of what has been discussed applies to vulvodynia and dyspareunia and these conditions frequently coexist with CPP.

As well as identifying the primary cause of the pain it is clearly important that the secondary consequences (be they musculoskeletal, psychological, gastrointestinal, sexual, etc) must also be managed and this is best done within a multidisciplinary setting. However, perhaps more important is

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that every girl or woman who presents to a health care professional with pain, at whatever age, is taken seriously. It is hoped that by validating the experience, treating acute painful episodes and managing recurrent pain, we may be able to reduce the burden of chronic pelvic pain in women.

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