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Things aren't always what they seem: differential diagnosis and common pelvic masqueraders

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Abstract

Pelvic joint pain, bladder and bowel dysfunction, sensory changes, and changes to sexual function have multiple causes. Since patients with these symptoms are frequently treated by physiotherapists, a knowledge of differential diagnosis is essential to ensure that potentially serious pathologies are identified early and managed appropriately. This paper explores four conditions that may present in the setting of a pelvic, obstetric and gynaecological physiotherapy clinic.

Keywords: axial spondyloarthritis, cauda equina syndrome, masqueraders, multiple sclerosis, visceral pain.

Introduction

The present paper explores some serious conditions that may masquerade as musculoskeletal disorders commonly seen by physiotherapists. Pelvic, obstetric and gynaecological (POG) physiotherapists are seeing an increasing proportion of these cases, and therefore, there is a greater requirement for them to be aware of potential differential diagnoses and the appropriate management of these patients. The author explores the presentation and management of cauda equina syndrome, multiple sclerosis, visceral referred pain and axial spondyloarthritis (SpA) in relation to the patients seen by POG physiotherapists.

Physiotherapists working in POG clinics will typically see a range of clinical presentations across a broad spectrum of patients of varying age groups and demographics, from pregnant teenagers to septuagenarian women with stress urinary incontinence. As a result, the POG physiotherapist requires a very broad knowledge of the common pathologies that can affect this wide variety of patients. This is a challenge in itself, and one that is made harder by the fact that, within this broad age range, there are numerous serious pathologies. These conditions can either masquerade as urogynaecological complaints or

musculoskeletal issues, or are serious spinal pathologies in themselves. The present paper explores some of these pathologies, and addresses clinical presentation, differential diagnosis and management.

Cauda equina syndrome

Cauda equina syndrome (CES) is a spinal surgical emergency: it requires immediate identification followed by emergency scanning and surgery (Todd & Dickson 2016) because the results of delayed management can be devastating for patients. It is the most litigated spinal complaint (Hutton 2019), accounting for 23% of all cases in England, and costing £29 million per year in the UK in compensation/negligence payouts. Traditionally, clinicians were taught to consider bladder and bowel retention and incontinence, alteration to saddle sensation, and loss of sexual function as symptoms of CES. This holds true today, but the definitions have become much more refined, including more-subtle signs of cauda equina dysfunction, in an attempt to help clinicians identify and, thus, manage, cases earlier. While this is undoubtedly a good thing, it does mean that there is more crossover with clinical presentations commonly seen by POG physiotherapists. The British Association of Spinal Surgeons (BASS) identifies four stages of CES presentation (Todd & Dickson 2016) (Table 1).

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Table 1. Classification of the stages of cauda equina syndrome (CES)

Stage	Symptoms
(CES-S) Suspected	Bilateral radicular pain (progressing, unilateral)
(CES-I) Incomplete	Urinary difficulties of neurogenic origin, altered urinary sensation, loss of desire to void, poor urinary stream, need to strain to micturate
(CES-R) Retention	Painless urinary retention and overflow incontinence
(CES-C) Complete	Loss of all cauda equina function, absent perineal sensation, patulous anus, paralysed insensate bladder and bowel

It is clear from the BASS recommendations and research evidence that delaying diagnosis of CES until the latter two stages (retention, CES-R; and complete, CES-C) results in very poor outcomes from surgery (Gleave & MacFarlane 2002; Srikandarajah *et al.* 2015; Song *et al.* 2016). Patients presenting with these symptoms do not recover bladder and bowel function, saddle/vaginal sensation, or sexual function following surgery. Todd (2017) described these symptoms of CES-R and CES-C not as red flags but white ones: by the time patients have developed incontinence, saddle sensory loss and decreased anal tone, it is too late for them to recover, and as clinicians, we may as well wave the white flag of surrender. Patients treated at the suspected (CES-S) or incomplete (CES-I) stages have a much better prognosis following surgery, and are expected to experience a return to normal function (Song *et al.* 2016).

This is clearly an important distinction that necessitates careful differentiation by the treating clinician. In the case of CES-I, many of these symptoms are caused by a range of other pathologies that are commonly seen by POG physiotherapists, but are clearly not CES. Conditions like urinary tract infection, prolapse, postpartum back pain with or without perineal tear/trauma, stress urinary incontinence, urgency urinary incontinence, and benign prostate hyperplasia, to name but a few, can all present with symptoms listed in the CES-I category. How can physiotherapists unpick this conundrum and identify patients with CES? There is no simple answer or definitive test available, but there are symptoms and clinical presentations to consider.

First, and probably most importantly, the timing of the onset of symptoms should be ascertained. In the vast majority of cases, CES occurs with back and/or leg pain, which is often severe and unlike any pain previously experienced by the patient (Greenhalgh *et al.* 2015). For patients in the CES-S category, the leg pain may be unilateral or bilateral, but symptoms that progress from unilateral to bilateral, those that alternate between legs or unilateral leg symptoms that are

worsening should all make the clinician consider onward referral for a magnetic resonance imaging (MRI) scan of the lumbar spine (NHS England 2017). This holds true even in the absence of bladder symptoms in the CES-I category. For patients without bladder symptoms, the scan does not need to be immediate, but for those with bladder symptoms, it needs to be performed on the same day. A low threshold for referral for MRI is recommended by BASS:

“A patient presenting with acute ([*de novo*] or as an exacerbation of pre-existing symptoms) back pain and/or leg pain with a suggestion of a disturbance of their bladder or bowel function and/or saddle sensory disturbance should be suspected of having a CES. Most of these patients will not have critical compression of the cauda equina. However, in the absence of reliably predictive symptoms and signs, there should be a low threshold for investigation with an emergency scan. The reasons for not requesting a scan should be clearly documented.” (Germon *et al.* 2015, p. 3S)

Like the subjective assessment, the physical examination for CES presents its own challenges. The current guidelines are clear about the need to perform a full neurological examination of the lower limbs. This is not controversial, and will give a good indication of possible radiculopathy. The guidelines also suggest that tests of saddle sensation and anal tone are performed, and also bladder scanning to assess residual post-void volume. These tests are widely used, but the evidence for their use in predicting CES is not strong (Korse *et al.* 2017). The anal tone test has been shown to have very poor reliability, and also a very poor correlation with positive MRI scan findings of CES (Gooding *et al.* 2013; Angus *et al.* 2016).

Access to emergency scanning, especially 24-h, 7-days-a-week imaging, can be a challenge, particularly outside of major spinal units or tertiary centres, and is a problem that has been recognized in the literature (Hussain *et al.* 2018). The responsibility of the physiotherapist

is to refer the patient to someone who can make a decision about same-day scanning, if needed. This may be through an accident and emergency department, or via orthopaedics/neurosurgery, depending on local provision. It is essential that the treating clinician has a clear and defined pathway to manage patients with suspected CES. This should ideally be written and agreed by all involved in the process locally.

Clinicians should not expect every person whom they send for imaging to have CES. Indeed, the percentage of patients presenting with symptom or signs of CES who have positive scans is reported to be only in the region of 11–15% (Fairbank *et al.* 2011; Woods *et al.* 2015).

It is also important to take into consideration the age of a patient: CES predominantly affects people under 50 years of age, with 70% of cases occurring in this age group (Korse *et al.* 2017). While this does mean that 30% of cases occur in people over 50, age may help to predict the likelihood of a patient having CES.

Multiple sclerosis

As mentioned above, there are many confounding alternative diagnoses for patients with symptoms that include bladder and bowel dysfunction, sexual dysfunction, and sensory changes in the limbs. One of these is multiple sclerosis (MS), another condition that physiotherapists need to be aware of and consider as part of their differential diagnosis. The MS Society (2019) reports that there are around 100 000 people in the UK with MS, with 5000 new cases being diagnosed per year, which equates to 14 cases per day. Women are nearly three times as likely to be affected as men, and symptoms usually first appear in the 30–35-year-old age group; however, a definitive diagnosis is usually made later, between 45 and 64 years of age (Mackenzie *et al.* 2013). In the UK, the highest rates of MS are found in Scotland, and worldwide, it is more common in Northern Europe, Australia, New Zealand and the USA.

The clinical presentation of MS can be extremely varied, but many of the early symptoms mimic either musculoskeletal disorders, or bladder and bowel problems; patients also present with transient visual disturbances, which are more traditionally recognized symptoms (Palace 2001). Bladder symptoms, such as frequency, urgency urinary incontinence and repeated urinary tract infections, are among the most common presenting symptoms, and should raise the

clinician's suspicion. Bowel constipation is also recognized as a frequent and common early sign of MS (Ghasemi *et al.* 2017). Pelvic, obstetric and gynaecological physiotherapists will frequently see these symptoms in patients referred for management of bladder/bowel dysfunction.

While the vast majority of such patients will not have MS or a neurological cause for their symptoms, this possibility should be considered. It may be useful to ask for further details when taking the subjective history in order to explore other common symptoms of MS. These include fatigue, weakness, sensory changes, balance issues, memory issues and cognitive impairment, as well as the previously mentioned visual disturbances like diplopia, blurred vision and pain with eye movement (Ghasemi *et al.* 2017). The sensory changes can usually be distinguished from radiculopathy because these tend to be more widespread and have a non-dermatomal distribution. Once again, weakness tends to be more widespread, and not in a specific myotome, as one would expect with a radiculopathy.

Alongside a detailed subjective history, a comprehensive neurological examination is helpful in differentiating between MS and radiculopathy. Sensation (e.g. light-touch and pinprick tests), power and reflexes should be assessed, tests of coordination (e.g. heel-to-shin and finger-to-nose tests in the lower and upper limbs, respectively) and tone should be performed, and possible upper motor neurone lesions should be verified (e.g. plantar response and Hoffman's reflex in the lower and upper limbs, respectively). This detailed physical examination will help with the differential diagnosis and inform any onward referral.

Given that MS most commonly affects the patient population mainly seen by POG physiotherapists, and also presents with many symptoms treated by these clinicians, it is important that this condition is considered as a possible cause of a patient's presentation.

Axial spondyloarthritis

Axial SpA is an umbrella term that covers inflammatory diseases of the spine. These include both radiographic SpA, where changes are seen on X-ray, and ankylosing spondylitis (AS) and non-radiographic SpA, where none are visible. Peripheral joints may be affected in related inflammatory conditions, such as psoriatic, reactive and enteropathic arthritis (NICE 2017).

Around one in 200 adults in the UK suffer from axial SpA, and it is now recognized that

this condition is much more prevalent than previously thought (NASS 2019). It predominantly affects younger people (between 18 and 45 years), with the average age of diagnosis being 24 (NASS 2019). Traditionally, it was thought to affect males much more than females, but more-recent evidence suggests comparable prevalence rates in men and women (NICE 2017). There are differences in presentation between males and females, with men being more likely to exhibit radiological changes, while women are liable to be more functionally limited, with a greater disease burden (Rusman *et al.* 2018). On average, it can take 3.5 years longer for women to get a diagnosis of SpA than men (Jovaní *et al.* 2017). The reasons for this are not clear; it could be because SpA is not considered as a differential diagnosis in women, or perhaps, because the symptoms do not present in the “classic” way.

Symptoms may present in a variety of ways, both in terms of site and severity, which can make diagnosis difficult, particularly if the symptoms are transient. This may explain why it can take an average of 8.5 years for affected individuals to get a diagnosis of SpA. Sacroiliac joint (SIJ) and thoracolumbar spine pain are the most common problems associated with SpA. Pelvic, obstetric and gynaecological physiotherapists will see many patients with SIJ/buttock pain both before and after birth. These women will predominantly be between 18 and 45 years, the primary age range for a diagnosis of SpA.

Apart from the location of the pain, several other features can help to differentiate SpA from mechanical-type pain.

Inflammatory-type pain has a different 24-h pattern; classically, the patient will complain of morning stiffness and pain on rising that lasts for longer than 30 min. The symptoms will be improved with movement and grow worse with prolonged inactivity during the day, and the patient may wake up at a regular time in the second half of the night. Pain will usually be eased with non-steroidal anti-inflammatory medication.

It is also important to ask additional screening questions that may help with the diagnosis. Axial SpA is also associated with other inflammatory manifestations that are more systemic. The patient should be asked about any history of persistent or concurrent enthesopathy, particularly Achilles tendinopathy, and plantar fasciitis, although other tendinopathies, such as lateral epicondylalgia and lateral hip pain, may also be relevant.

Other non-articular manifestations include: uveitis/iritis (i.e. dry/inflamed/red/irritated eyes); inflammatory bowel disease, such as colitis and Crohn’s disease; dactylitis (sausage-like swollen fingers); and psoriasis (in the patient herself or a first-degree relative).

Viscerally referred pain and symptoms

Pelvic, obstetric and gynaecological physiotherapists will be familiar with the concept of visceral pain masquerading as a musculoskeletal problem. This is relatively common in cases of pain transmitted from the uterus and ovaries. It is useful to have a clear picture of where all the viscera refer to and what additional symptoms to look out for, and this process can start with the body chart where the symptoms are mapped. The viscera have relatively defined areas of referral (TFD 2019).

The lower abdominal, pelvic and upper thigh pain referral areas are all relevant to POG physiotherapists, and clear questioning about the functioning of the viscera that can refer to these areas should be an essential part of the subjective history. Visceral pain is thought to be responsible for up to 2% of all low back pain (Deyo 1986).

Visceral pain is often described as feeling different to musculoskeletal pain. Patients may report that it as a much more diffuse and vague pain that is poorly localized (Cervero 1988; Giamberardino *et al.* 2002; Sengupta 2009; Sikander & Dickensen 2012). Visceral pain often, but not always, starts in the midline before radiating peripherally, but it may produce somatic-type symptoms (Gerwin 2002) or symptoms in more distal areas (Giamberardino *et al.* 2010). The broad range potential areas in which symptoms may be manifested is a result of the diverse innervation of the organs, which have multiple-level afferent and efferent connections. Visceral pain is often associated with autonomic symptoms as well as strong affective reactions from the patient, which can further complicate diagnosis (Sikander & Dickensen 2012).

While there are similarities between somatic pain and visceral pain, key differences help to explain the nature of the presenting symptoms (Cervero & Laird 2004). There are relatively small numbers of afferent fibres from the viscera, which account for about 10% of the total afferent nerves reaching the dorsal horn. Before connecting with the dorsal horn, these fibres diverge extensively, often over several spinal levels,

which explains the often-diffuse nature of visceral symptoms (Sikander & Dickensen 2012). As the afferent nerves reach the spinal cord, these converge with somatic afferent fibres at the segmental levels. This convergence is thought to be the mechanism by which visceral referral mimics dermatomal referral patterns, and it produces the recognized visceral referral patterns seen in the body chart in TFD (2019) and Table 2.

If a patient's presentation suggests possible visceral referral, then examination of the abdomen is a useful clinical adjunct that may help to establish a diagnosis. The skills required are easy to learn, add depth to the physical examination and are very relevant for POG physiotherapists.

The examination should include:

- *Inspection* – the patient's abdomen should be inspected for: asymmetry, or any obvious lumps and bumps; post-operative scarring; any signs of injury; flank bruising; and skin changes, such as spider naevi or pulsatile/expansile masses. Physiotherapists are skilled observers and this additional task should not prove challenging, although the interpretation of some findings may require a little additional knowledge.
- *Palpation* – abdominal palpation should be performed in a structured and methodical way. The aim is to determine whether there are any painful areas, and whether there are any firm and palpable/pulsatile masses within the abdomen. It may also be possible to reproduce the

patient's symptoms with palpation, and therefore, it is important to monitor any specific signs throughout the process.

Visceral pain is extremely common, and spinal pain of visceral origin is also relatively common. The latter is more common than the spinal red-flag pathologies that rightly occupy our thoughts, but is less often considered in the differential diagnosis of spinal pain. Consideration of the possibility of visceral referral, and the addition of expanded subjective and physical examinations, will enhance detection of this condition and its management in the POG setting.

The present paper has explored four different pathologies that require any treating clinician to engage in more-detailed questioning and examination. These conditions are clinically relevant to POG physiotherapists, and should form part of the differential diagnosis of patients who present with bladder and bowel symptoms, sexual dysfunction and pelvic pain. The early identification and treatment of each of these pathologies is likely to improve the outcome for the patient.

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Table 2. Common visceral referral patterns and symptoms: (PV) *per vaginam*; and (LBP) low back pain

Organ	Possible pain distribution	Possible symptoms
Liver	Right lower thoracic pain, right shoulder pain, right epigastric pain, joint pain/back pain	Jaundice, pruritic (skin itching), yellowing of eyes, dark circles around eyes, sweating, fever, strong body odour, bad breath, pale/grey stools, dark urine, fatigue, weight loss, nausea/vomiting, bloating, testicular swelling
Gall bladder	Epigastric pain, right shoulder pain, right lower thoracic pain	Worse after food
Pancreas	Epigastric pain, left or right shoulder pain, mid-thoracic pain	Nausea, vomiting
Stomach	Mid-thoracic pain, epigastric pain	Bloating, belching, reflux, heartburn, nausea, vomiting, weight loss, anorexia
Kidney	Loin pain, lateral buttock and thigh pain, lower quadrant abdominal pain, groin pain	Colic-type pain, changes to micturition, haematuria, pyrexia, urinary tract infection
Bowel	Central and lower abdominal pain, lower-quadrant abdominal pain (left > right)	Increased flatus, stool colour changes, odour changes, consistency changes, frequency/constipation
Ovaries	Abdominal pain left or right mid-abdomen	Abdominal bloating, decreased appetite, fatigue, urinary frequency/urgency, PV bleed, dyspareunia
Uterus	Central LBP, posterior thigh pain, abdominal pain	PV bleed, dyspareunia, loss of appetite, fatigue, menorrhagia, urinary frequency, constipation
Bladder	Central suprapubic pain, central pain over sacrum, pain around gluteal crease (left or right, or both), perineal pain	Frequency, painful micturition, changes in urinary habits, repeated infection
Prostate	Genital pain, LBP perineal pain	Nocturia, slow urinary flow, terminal dribbling, erectile dysfunction, urinary frequency
Abdominal aorta	LBP, flank pain, groin pain	Early satiety (feeling full), nausea, vomiting

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