Hormonal related joint injuries in women

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Hormonal related joint injuries are now a focus of attention and is much welcomed. I recall as a medical student seeing a consultant advise a young lady with joint pains that the remedy for alleviating her symptoms was finding herself a boyfriend. Whilst I'm not sure as the cause of her symptoms, there are numerous distressed women presenting to my clinics with joint pains, with no obvious mechanical cause, who have felt dismissed and unheard at previous orthopaedic interactions.

Increased awareness of hormonal related joint pain is essential due to the scale of the problem. Up to 70% of women during perimenopause and menopause will experience musculoskeletal symptoms including joint aches and muscle pains. In 25% of women, symptoms can be severe[1]. Women are more likely to suffer ruptures of the anterior cruciate ligament (ACL) then men[2,3,6], from 1.7-8 X during the pre-ovulatory and ovulatory phases of the menstrual cycle[2]. ACL injuries are associated with a significant risk of developing secondary knee osteoarthritis, even despite ACL reconstruction[3]. ACL injuries are rightly getting much attention due to increasing numbers of women's football and rugby teams, but women are also prone to pelvic girdle instability, patellofemoral dysfunction, ankle sprains as well as osteoarthritic changes in other joints. Appropriate management is fundamental for successful outcomes for this large section of the population.

There are several studies that have confirmed a link between changes of oestrogen levels and various joint injuries and musculoskeletal problems[1-2,4]. Oestrogen is an anti-inflammatory agent, which helps maintain bone and cartilage health and aids tissue repair. During menstruation and particularly menopause, there are reduced oestrogen levels which lead to reduced connective tissue metabolism, potentially making ligaments and tendons lax and hence more prone to injury, increased joint inflammation, loss of lean muscle and strength. Menopause can lead to rapid bone

loss and increased degradation of joint cartilage and progression of arthritis. A recent study in 2025 looking at neuroinflammation, suggests the relationship with oestrogen and inflammation is complex and it can be anti-inflammatory or pro-inflammatory, depending on the context and concentration. Their study using a computer model, suggested high oestrogen levels may lead to more pro-inflammatory proteins after injury, which can affect injury outcomes[5]. It is not known if there is a similar effect on joints and may be relevant when oestrogen levels are elevated just prior to ovulation. Other hormones such as progesterone and relaxin also play a role[4]. Increased progesterone has a mild catabolic effect on tissue, sometimes slowing repair and influencing thermoregulation and fatigue. These will impact movement patterns. Relaxin fluctuates throughout the menstrual cycle and along with oestrogen, leads to increased ligamentous laxity, affecting all joints.

Further research is required to determine the most appropriate timing of surgical interventions during the hormonal cycle, whether genetic markers can be identified and modified for ligamentous laxity and the impact of hormones on graft healing and re-rupture rates. With a better understanding of the interplay between hormones and joint function, future orthopaedic treatment can be individualised.

Hormonal fluctuations are not the sole cause of women's predilection for injury. Anatomical differences and differences in gait patterns contribute[6], as does ignorance regarding appropriate training/rehabilitation regimes, inadequate access to training facilities and coaching as well as late detection of problems[7].

Women present fairly frequently to my clinic with pelvic/ hip pain, without obvious underlying musculoskeletal disease, that has failed to respond to physiotherapy. The presence of urge incontinence, frequent micturition due to incomplete bladder emptying or painful intercourse are not uncommon, suggestive of primary pelvic floor dysfunction. Pelvic floor dysfunction can lead to chronic pelvic pain or associated musculoskeletal disorders, such as the hip, lumbar spine, sacroiliac joint, pubic symphysis or abdominal wall. It is estimated that 22% of musculoskeletal disorders are associated with pelvic floor disease and pain[8] and lifetime occurrence of chronic pelvic pain in women is said to be 33-40%[9]. Other pelvic floor dysfunction symptoms that may be present are constipation, heaviness or pressure in the pelvis and rectal pain[8,9]. These are not questions generally asked in an orthopaedic consultation, hence this condition may be missed, leaving many women inadequately treated. As pelvic dysfunction is not only seen in postpartum or post-menopausal women, but also seen in

young women and men[9], questions should perhaps, be asked of all, when an obvious cause of pain is not found. I retrospectively detected it in three male cyclists in my patient population. I was not sufficiently clued up at the time they were initially reviewed and asked the questions retrospectively, when one, reported back to me that that gluteal and core strengthening exercises had only partially treated his pain, but symptoms resolved after pelvic floor directed treatment. This is not coincidental. Two physiotherapists published a case report on effectively resolving hip pain in a cyclist by pelvic floor fascial manipulation therapy, when other methods failed[10]. Another case series reported successful treatment of two male patients with this condition[9]. Fortunately, physiotherapists are much more aware and there has been an increase in women's health physiotherapy, which incorporates pelvic floor training into their treatment regime. However, it should not be left to our physiotherapy colleagues to adequately assess and treat these patients. Patients will not readily volunteer this information and it is up to us, the clinicians, to ask.

Managing patients, particularly those postmenopausal, requires empathy, knowledge and cross speciality working. Education, adequate diet, including vitamin D and calcium, hormone replacement / regulation therapy as appropriate, physiotherapy (strength training and conditioning), patella taping), bracing/ supports, behavioural modification and weight loss are the foundations of treatment.

A study reviewing gender differences in orthopaedic treatment in relation to knee arthroplasty, has shown that male surgeons are 22 times more likely to offer knee replacement surgery to male versus female patients[11]. This highlights the presence of gender bias that can potentially be extrapolated to all forms of treatment. Another study has found that female doctors are more likely to care for women with complex psychosocial complaints, provide better patient counselling regardless of sex of the patient, but also are more likely to provide gender specific screening[12]. A solution therefore is increasing the number of female orthopaedic surgeons, but this cannot be the only solution. Raising awareness of all is mandatory, as it is a collective responsibility to ensure mothers, sisters and daughters are adequately cared for. If this is not enough incentive, in the United States, annual medical costs and loss of productivity have been estimated at $2.8 billion and $15 billion, respectively, with a 45% reduction in work productivity noted due to chronic pelvic pain alone[9].

The British Orthopaedic Association's (BOA) strategic mission for 2025-2029 is 'Relieving pain, Restoring Function and Transforming Lives'[13]. Due to widening participation and mentorship schemes, as well as Industry engagement such as making surgical instruments more user friendly, orthopaedics, and in particular hip and knee surgery, have become more accessible, with greater numbers of women entering the subspecialities. However, if we are to achieve the mission set out by the BOA, the ability to improve surgical impact must be matched by improved diagnosis and non-surgical care. This will only occur with increased knowledge and awareness by all. Hopefully this article is a small step towards achieving that goal. ■

References

References can be found online at www.boa.ac.uk/publications/JTO.