Encouraged by government advice to exercise daily for 30 minutes during lockdown, will we see an increase in overuse running injuries?



Sports Medicine

or those involved in sport and exercise, significant restrictions during the COVID-19 pandemic have included the suspension or postponement of major sporting events as well as the temporary closure of sporting clubs and gyms. The UK government advocated one form of exercise a day such as walking, running or cycling in order to maintain the many positive benefits that daily exercise brings during a highly stressful time.

No reliable statistics or figures are available yet, but it is fair to assume there has been an increase in running, given that it is widely available to anyone who wishes to participate at a relatively low cost with minimum equipment.

Overuse injuries through running

Running is one of the most common activities in which overuse injuries of the lower limb occur. It is estimated that 27% to 70% of runners will experience a lower limb overuse injury during a 12-month period (Ferber et al, 2009). Some of the most common overuse injuries include patellofemoral pain, medial tibial stress syndrome, achilles tendinopathy, plantar fasciopathy and stress fractures of the tibia and metatarsals. Running injuries are multifactorial and diverse, with intrinsic and extrinsic risk factors that can lead to an injury (Barton et al, 2016).

It is reasonable to hypothesise that during the recent lockdown period there has been an increase in potential injury due to error in training load or tissue capacity.

Training load and tissue capacity

There is a relationship between training load and overuse injury with 60% to 70% of overuse injuries occurring due to training errors (Drew and Finch, 2016). The load that a tissue can tolerate will depend upon the volume, the frequency, the intensity and the type. With adequate recovery periods, the capacity of the tissue to tolerate load can improve, and in the case of tendons even promote tissue healing (Mueller and Maluf, 2002). Any sudden changes or spikes in load can increase the risk of developing an overuse injury. Pope et al (2017) outline recommendations to guide runners on how to appropriately increase their training and to avoid a sudden spike in load. The consequences of a sudden spike may not be apparent until three to four weeks afterwards (Drew and Finch, 2016).





Gabbett (2016) states that the opposite is also true, any sudden decrease in training load may predispose to a running injury if a return to running is not modified in such a way to allow the tissues to adapt. This may be of significance to frontline and key workers who would normally participate in running and have found their normal training regime interrupted due to the demands of their work during the pandemic. Gabbett (2016) highlights the risk ratio between acute and chronic workload balance, as shown above in Figure 1.

Running culture has a support network of family, friends, running clubs and coaches. This often guides runners' beliefs and decisions regarding training and progression. Clearly during the lockdown, these support networks have been interrupted due to isolation even though remote communication appears to be effective. It does however raise the question, could the isolation from running peers be reflected in training errors? Recent social media challenges such as 'Run 5km, donate £5, nominate 5 friends' and '5km a day in May' are a few examples of wellintentioned events that carry significant injury risk to those not accustomed to running and associated load.

The other major problem during the lockdown is access to healthcare professionals for advice, treatment, and prevention. Do the injured resort to self-help with internetderived information, and does this lead to worsening of the injury and disability?

Common overuse lower limb running injuries



1 Tibial stress fracture and medial tibial stress syndrome (MTSS)

Tibial stress fracture will present with localised bone tenderness as a result of an overuse injury either secondary to bone fatigue or bone insufficiency (Pegrum et al, 2012). MTSS is defined by site of pain, which

is usually tenderness along the lower third of the medial tibia. In some cases, it can coexist with chronic exertional compartment syndrome (CECS) of the deep posterior

compartment, which may need investigating if the treatment for MTSS is unsuccessful.

Clinical picture: Tibial stress injuries will present with localised bone tenderness aggravated by activity, which may present during day-to-day activities as the injury progresses (Pegrum et al, 2012). The pathology of MTSS is unknown, and it is thought to be a symptomatic expression of normal periosteal modelling at the site of maximum tibial strain under load.

The patient will complain of pain during exercise and can usually run through pain, with worse pain after cessation of the exercise and at rest. Pain can last for up to few minutes and in some cases hours and days.

Investigations: MRI scan, plain X-ray to exclude other bone pathology, isotope bone scan and dynamic intracompartment pressure, if CECS suspected.

Treatment of tibial stress fractures: Rest, immobilisation (Aircast walker) and review as symptoms regress. Treatment of MTSS: Rest in acute phases, physiotherapy, biomechanical and functional gait analysis including gait retraining, foot orthoses, injection (steroid and 15% glucose) under ultrasound guidance, shock wave therapy and in recalcitrant cases, surgery (Brukner et al, 2017; Neal et al, 2014).



2 Mid portion achilles tendinopathy (AT)

Mid portion AT is characterised by local tendon pain and swelling at the mid portion of the AT. It affects recreational and elite athletes, with 9% of athletes involved in running or jumping suffering from AT. But it also affects a varied population:

33% of AT patients are sedentary individuals, particularly men aged between 35 and 45 years (Rowe et al, 2012). **Clinical presentation**: The aetiology of AT is multifactorial; however, overuse, adverse lower limb biomechanics, tendon vascularity, BMI and footwear are proposed risk factors. Those with systemic conditions such as diabetes mellitus, inflammatory and autoimmune conditions may also be affected (Rowe et al, 2012). The most common pathomechanism to injury involves an increase in training volume or intensity resulting in exposure to unaccustomed repetitive high loads (Gabbett, 2016).

"Do injured runners resort to self-help with internet-derived information, and does this lead to worsening of the injury and disability?"

Investigations: Ultrasound scanning (USS) is a valid and appropriate method for imaging AT (Sunding et al, 2016). The higher spatial resolution allows visualisation of finer structures not seen on magnetic resonance imaging (MRI). USS will show the characteristic tendinopathy traits of tendon thickening, neovascularisation and hypoechoic areas. MRI may be necessary in some instances to exclude differential diagnoses such as posterior ankle impingement (Brukner et al, 2017).

Treatment: Eccentric loading programme, activity modifications, extracorporeal shockwave therapy (ESWT), foot orthoses, biomechanical and gait assessment, injections (cortisone, high-volume image-guided injections), regenerative medicine and surgery (Rowe et al, 2012; Chan et al, 2008).



PF is an overuse injury associated with pain and structural

B Plantar fasciopathy (PF)

with pain and structural changes to the plantar fascia at its insertion on the medial calcaneal tuberosity (Brukner et al, 2017). It is one of the most common causes of plantar heel pain, and accounts for 7% of all running injuries (Hill et al, 2008).

Examination will reveal tenderness at the insertion of the plantar fascia.

Clinical picture: A degenerative process is more prevalent than inflammatory due to fascial thickening, oedema, fibrosis, collagen necrosis and neovascularisation (Lemont et al, 2003). The patient will report a gradual onset of pain, first-step pain in the morning or after prolonged sitting, which is often linked with a recent increase in activity such as walking or running (Brukner et al, 2017).

Investigations: USS will reveal fascial thickening of greater than 4.0mm (Figure 2, right), hypoechogenicity, delamination and tears (Brukner et al, 2017). MRI may be useful to rule out other causes and atypical findings such as calcaneal stress fractures and tumours (Monteagudo et al, 2018).

Treatment: A multifactorial approach is advised with evidence for the use of ESWT, physiotherapy, patient education, taping, custom foot orthoses and footwear modifications (Brukner et al, 2017).



FIGURE 2: Ultrasound scan of plantar fascia thickening of 4.70mm

④ Patellofemoral pain syndrome (PFPS)

Collins et al (2016) defines PFPS as pain around or behind the patella aggravated by patellofemoral joint-loading activities such as sitting, squatting and running. It is one of the most prevalent conditions seen in sports medicine, with

poor long-term management outcomes (Lack et al, 2018). **Clinical picture:** PFPS is a complex multifactorial condition Lack et al (2018) report structural, biomechanical, volume and psychological factors. Proximal, distal and local biomechanical deficits often present together and may not exist in isolation (Lack et al, 2018). **Investigations:** Most patients will not require imaging; however, plain X-ray may detect bone changes such as bipartite patella, apophyseal changes, osteoarthrosis, tumour and infection (Brukner et al, 2017). **Treatment:** Multifactorial patient-focused treatment that addresses proximal, distal and local deficits involving physiotherapy, movement retraining, foot orthoses and education (Matthews et al, 2020; Lack et al, 2018; 2014).

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CONCLUSION

This article aims to raise awareness of the common overuse conditions which may present to our clinics with greater prevalence because of training errors sustained during the COVID-19 lockdown.

As there is a lack of reliable and validated evidence on the perceived increase in overuse injury during this lockdown, the author plans to conduct a UK-wide questionnaire, to which all healthcare professionals involved in injury management will be invited to take part.

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