A review of pain and injuries attributable to the shoulder girdle; their current treatment methodologies and relevance to massage therapy in triathletes over 18.

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"I certify that this work has not been accepted in substance for any degree and is not concurrently being submitted for any degree other than that of the Diploma in Advanced Clinical Massage and Sports Massage being studied at Jing Institute. I also declare that this work is the result of my own investigations except where otherwise identified by references and that I have not plagiarised the work of others".

Mrs Tracey Abbott: _____

Date: 31 March 2024

Thank you, Jon, for your patience and forbearance over the last three years! I could not have done it without you.

I promise no more dissertations!

ABSTRACT

This paper thoroughly reviews the current research findings from meta-analyses and systemic reviews on treating shoulder girdle pain in triathletes over 18. It considers the current medical protocols in the National Institute for Health and Care Excellence and reviews whether clinical massage therapy has a role as a primary or adjunct treatment modality when treating SGP in triathletes.

A detailed review of the current research into overuse injuries relating to SGP is explored, together with a review of the current understanding of the aetiology of these injuries.

The potential integration of the biopsychosocial model and its benefits to treatment outcomes are considered, with a review of the recent research on the benefits of including psychosocial information in maximising injury recovery in athletes.

The research indicated that clinical massage could be beneficial in obtaining the best recovery outcomes for athletes. However, further research is required with larger research samples and consistency in the definition of massage therapy to increase comparability between studies. There is evidence of the benefits of using specific protocols, allowing the results of several studies to be combined and resulting in the availability of larger, directly comparable sample sizes.

The research also identified the need for further work in many areas. There needs to be more knowledge explicitly relating to triathletes and SGP; significant questions remain regarding the consistent diagnosis of shoulder pathologies, and the current medical model is also often not fit for purpose when treating athletes and generally does not consider the benefits of the BPS model.

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ABBREVIATIONS

BPS ("Biopsychosocial")

GHJ ("Glenohumeral Joint")

HFMAST ("Heat, Fascial Techniques, Muscles, Acupressure Points, Stretching, Teaching")

Jing Method of Advanced Clinical Massage ('JMACM")

MA ("Meta-Analysis")

MFR ("Myofascial Release")

MSK ("Musculoskeletal")

NICE ("National Institute for Health and Clinical Care Excellence")

NSAID ("Non-Steroid Anti-inflammatory Drugs")

RCT ("Randomised Control Trial")

ROM ("Range of Motion")

SD ("Scapular Dyskinesia")

SGP ("Shoulder Girdle Pain")

SR ("Systematic Review/s")

SRy ("Scapula Rhythm")

SAPS ("Subacromial Pain Syndrome")

TP ("Trigger Points")

Introduction

This review was prompted by the work undertaken in the clinic, where approximately 10% of the client base participates in Triathlon events. Increasingly, these clients have been presenting with shoulder girdle pain ("SGP"), which piqued an interest in knowing why. Clients reported very little success using the established medical routes and were turning to complementary treatments, including massage, which had yielded positive results. They had expressed frustration at the speed of treatment availability under the National Health Service, resulting in a prolonged recovery time. This was coupled with some physiotherapist's lack of appreciation of the effect on both their mental and physical health due to having to restrict their training whilst recovering from injury.

This study has identified limited research undertaken, specifically about triathletes and SGP (see Gosling et al. 2007; Rhind et al. 2022). Consequently, this review has focused on shoulder injuries in athletes, specifically swimmers, who suffer high incidences of shoulder problems, and it is one of the triathlon disciplines. The research showed that most SGP and injuries experienced by triathletes are related to overuse rather than traumatic injuries (Schorn et al. 2018; Andersen et al. 2013); consequently, the paper focuses on overuse injuries.

The Aim of this Paper

This explains why appropriate treatment for athletes over 18 suffering from SGP is vital to their recovery and mental health. It reviews what is available, explores the benefits each option offers, and explains why massage needs to be part of the equation.

Section 1 discusses what is meant by SGP. Section 2 assesses how SGP affects triathletes. Section 3 looks at current medical interventions. Section 4 looks at the effect of injury on the

athlete's mental health. Section 5 considers the effects of massage on SGP and, specifically, the benefits of using the Jing Method of Advanced Clinical Massage ("JMACM").

Google Scholar, PubMed, and the National Institute of Health were used to access the relevant documents. National Institute for Health and Clinical Excellence ("NICE") guidelines were also reviewed. Literature published between 2010 and 2024 was prioritised. Older publications were only included where more recent publications were absent. Priority is given to higher levels of evidence based on the GRADE framework (Siemieniuk and Guyatt, BMJ Best Practice; Burns et al. 2011) being systematic reviews ("SR"), meta-analysis ('MA") and randomised control trials ("RCT"). There were no specific ethical considerations, as the review was limited to published works and included no client interface.

The paper started as a small-scale case study, but identifying athletes with SGP and working around their training programs and current treatment timelines proved too tricky. Athletes were not able to fit around the timetable set for the study. The intention was to use the SPADI as the testing instrument. As a result, this research project developed into a literature review of the subject.

Section 1: What is SGP?

Section 1.1:A summary of the prevalence of SGP in the UK and worldwide

To understand the effect of SGP on triathletes, it is helpful to understand the magnitude of SGP in the general population; this aids the understanding of the treatment protocols for the general population and how the approach is often not appropriate or sufficient for triathletes' needs.

SGP is the third most common musculoskeletal ("MSK") pain-related reason for GP visits (Artus et al. 2014) and arguably one of the most complex. Lucas et al. (2022) examined shoulder pain's global prevalence and incidence, concluding that a significant proportion of the world's population suffers from shoulder pain.

Section 1.2: Why is the Shoulder Girdle so complex? What can go wrong?

The shoulder girdle is one of the most complex areas of the MSK system, made up of four separate joints (sternoclavicular, acromioclavicular, glenohumeral ("GHJ") and scapulothoracic) (Chang et al. 2023). Also, three bones (clavicle, scapula, and humerus) and seventeen scapula thoracic muscles (Frank 2013). The GHJ is one of the human body's most mobile and versatile joints (Cowan et al. 2023), allowing abduction, adduction, flexion, extension, internal and external rotation, horizontal adduction and abduction and circumduction (Miniato et al. 2023). The GHJ is described by Gibbons (2019: 18) "as a golf ball (humeral head) sitting on a tee (glenoid fossa)," thereby reducing the GHJ's inherent stability mechanisms.

Gibbons (2019: 18) confirms that to increase the GHJ's stability, other dynamic stabilisers, such as the rotator cuff muscles and the long head of the biceps brachii, are used. These, combined with the passive stabilisers, including the joint capsule, associated ligaments, and the glenoid labrum, are all used to aid stability (Cifu and Eapen 2021:715-726: Gibbons 2019:18). These all add to the GHJ's complexity.

Most SGP is on shoulder abduction (Garving et al. 2017). This complex movement requires the coordinated action of the GHJ and scapulohumeral rhythm ("SRy")) (Scibek, Carcia 2012); when the humerus abducts, the scapula rotates at a 2:1 ratio (Gibbons 2109:34-35).

The extensive range of movement (“ROM”) can often result in shoulder injuries, leading to weaknesses in the associated musculature and, ultimately, dysfunctional movement patterns (Tooth et al., 2020).

Dysfunctional movement patterns are thought to occur, specifically scapular dyskinesia (“SD”), where the SRy is not functioning correctly (Panagiotopoulus et al. 2019). They also note there is often a lack of understanding of SD, and consequently, it is often not rehabilitated, leading to recurrent issues. There are various discussions about the causes/effects of SD on several pathologies, including rotator cuff abnormalities (Longo et al., 2023), shoulder capsule issues, and shoulder impingement (Panagiotopoulus et al., 2019). Still, there is a consensus that SD is significant in overuse pathologies of the shoulder.

Recent research (Lopes et al. 2015) has indicated that increased upper trapezius activation and weakened serratus anterior can affect SRy and cause SD, resulting in subacromial impingement syndrome.

McQuade et al. (2016) questioned the paradigm that SRy and SD anomalies cause shoulder issues and concluded that they do not. However, his research contradicts other findings (Longo et al., 2023; Lopes et al., 2015; Panagiotopoulus et al., 2019).

SGP is consequently a complex issue to treat.

Section 1.3 The main SGP Pathologies relating to overuse.

Due to their complexity, several SGP pathologies related to overuse exist. Terms are often used interchangeably, leading to confusion and difficulties in diagnosis (Thomas, 2023; Witten, 2023).

Historically, subacromial impingement syndrome (Neer 1972) was often used to describe any anterolateral shoulder pain on shoulder abduction. There has been much discussion about

whether this is correct (Cools and Michener 2017; Diercks et al. 2014). The most current label is subacromial pain syndrome ("SAPS"), which describes pain thought to originate in any lesions in structures between the humeral head and the acromion. (Witten 2023). It, therefore, can include "all conditions such as subacromial bursitis, calcific tendonitis, rotator cuff tears, biceps tendinopathy or tendon cuff degeneration" (Thomas 2023:17). Unfortunately, there is still significant discussion regarding the cause of SAPS making diagnosis and treatment complex (Diercks et al. 2014: Thomas 2023:21). Further work is required to establish homogeneous terminology when diagnosing. This view is supported by Thomas (2023:21), thereby allowing more significant comparisons in clinical studies and leading to more precise, consistent guiding management to improve clinical outcomes, potentially reducing the use of costly surgery and aiding patients' self-care.

Section 2: SGP and Triathletes

SGP is a significant issue for athletes, especially those involved in overhead activities (Cools et al. 2015), including triathletes. The pain and limited ROM impact the triathletes' ability to compete and train.

Due to the increase in triathletes, the number of those suffering from associated pain and injuries has also increased. The physical burden of triathlon training is greater than that of the component sports (Vleck et al. 2014).

Section 2.1: What is a triathlon?

Triathlon is a sport that combines the three disciplines of swimming, cycling, and running with certain technical constraints (Bentley et al. 2002). It has benefitted from a significant increase in UK athletes participating in events, the latest figures showing over 165,000 (Roethenbaugh 2018).

Section 2.2: Why are triathletes vulnerable to SGP?

Many athletes see triathlon as a way of totally challenging their bodies as it incorporates the three individual disciplines. Distances vary from sprint triathlons (around 15 miles) to Ironman events (over 140 miles). This means a significant difference in training volumes and physiological adaptations between different events (Guevara et al., 2023), which could influence injury levels. Research has yet to be carried out on this specific area.

The high training volumes the triathletes require, and the physical stresses placed on the body during competitions often result in acute and overuse injuries (Andersen et al., 2013). Rhind et al. (2022) undertook an SR, which identified overuse injuries had a prevalence anywhere from 37-91% over a year. Acute injuries ranged from 24-27%. He noted a lack of literature reporting on MSK injuries in long-distance triathletes, which accords with the findings when researching this paper.

It is thought that the leading cause of SGP in triathletes relates to the swim element, but this can be compounded by training for other disciplines. However, research is lacking.

Hamilton (2022) describes risk factors for SGP in triathletes as a combination of intrinsic and extrinsic factors. Intrinsic factors include a lack of muscular flexibility and strength around the shoulder girdle and blade, a lack of rotational strength and ROM of the GHJ and a previous history of shoulder pain. Extrinsic factors include incorrect or overuse of strength training equipment, faulty technique, and high levels of training volume.

Tooth et al. (2020) SR noted that several factors could increase the risk of shoulder injuries, including overhead movements, rotator cuff weaknesses, previous injuries, and lack or excess ROM.

Concerning chronic overuse injuries, Liaghat et al. (2022) found that SGP is most indicated in shoulder abduction and overhead motion in ‘overhead athletes' such as swimmers and tennis players. Walker et al. (2012) researched swimmers and found that 23% had shoulder injuries and 38% had shoulder pain in 12 months.

Wanivenhaus et al.'s (2012) review of competitive swimmer injuries found that the leading cause is muscle fatigue of the upper back, rotator cuff, and pectoral muscles. The repetitive movement and the destabilisation of the humeral head can cause microtrauma to the GHJ. This, combined with the time-trial specific bike position, internally rotated shoulders from the narrow arm position with the chin held low, can increase the strain on the cervical spine and shoulder girdle, resulting in severe pain, loss of power and associated restriction in ROM (Wanivenhaus et al.'s (2012)). Weiss (1985) found neck and shoulder pain was experienced by 20% of long-distance cyclists.

Section 2.3: What shoulder girdle injuries do triathletes experience?

As noted previously, SGP affecting triathletes can be divided into acute and overuse injuries (Schorn et al., 2018).

Acute injuries are often experienced “in race”, such as collisions during the swim or falls during the bike or run. Incidences ranged from 0.33% to 6% (Schorn et al. 2018; Feletti et al. 2022). Acute injuries included broken bones (such as clavicle fractures or avulsion fractures to the glenohumeral tubercles), rotator cuff strains (particularly supraspinatus), and ligament sprains.

Overuse injuries - due to prolonged training sessions and training frequency are more common, potentially due to SD. Schorn’s research (Schorn et al., 2018) indicated that 18% of triathletes suffered shoulder-related overuse injuries. In contrast, Andersen et al. (2013) noted

from their cohort study that 42% of triathletes had shoulder issues over the six-month study period. This correlates with the prevalence of the injuries in the researcher's clinic. Overuse injuries can include rotator cuff abnormalities, labral tears, supraspinatus and bicipital tendinopathies, glenohumeral instability, and sub-acromial bursitis.

The results of the above research (Schorn et al. 2018; Andersen et al. 2013) demonstrate that the primary injuries triathletes suffer are overuse. Consequently, this literature review has been focused on this area.

Lauretta (2023) suggests that the most common swim-related, overuse-type injuries in triathletes are shoulder impingements (usually supraspinatus and AC joint are implicated) and swimmers' shoulder (subacromial bursitis).

Davis, Nickerson and Varcallo (2022) suggest the umbrella term swimmer's shoulder now covers several shoulder pathologies, including "impingement syndrome, rotator cuff tendinitis, labral injuries, ligamentous laxity or muscle imbalance causing instability, muscular dysfunction and neuropathy from nerve entrapment". They note that it is very difficult to obtain an accurate diagnosis due to the complexities and variations surrounding the condition. Again, these are likely to be overuse injuries.

On reviewing the research, most of the common overuse-related shoulder injuries suffered by triathletes fall under the SAPS umbrella. Until there is a better understanding of the aetiology, confusion over the best treatment will remain (Thomas, 2023)

Section 3: Current medical interventions for triathletes with SGP

The current interventions for triathletes for SGP come within the NICE guidelines (2022) but have been developed for use in the general population. An assessment is usually undertaken, including taking a history and performing an examination. Unless trauma or symptoms last

more than four weeks with no improvement or severe pain, then X-rays are not considered necessary. According to NICE guidelines, ultrasounds and MRI scans are not usually requested in primary care settings.

Artus et al. (2017) surveyed UK GPs to establish what treatments were provided to patients by GPs for SGP. The most common diagnostic tools were MRIs (contrary to the NICE guidelines noted above) and blood tests. These resulted in over 70% being referred to physiotherapists and around 60% being prescribed Non-Steroid Anti-Inflammatory Drugs ("NSAIDs'). There was, however, only a 15% response rate and, therefore, a risk of non-response bias. This is concerning when looking at the efficacy of these treatments below.

NICE guidelines (2022) specify that the initial management of a person with SGP should include an explanation of the diagnosis, advice regarding work and activity, the prescription of analgesia, and consideration of a physiotherapy referral. This level of intervention is usually insufficient for most triathletes as the timescale to see a primary healthcare practitioner and, if prescribed, secondary investigations is not conducive to an athlete's timetable (current data shows that at least 25% of patients are waiting over six weeks for diagnostic tests, Baker 2023:20). NICE guidance also specifies rest from aggravating sport and advising that rehabilitation can be a least six months. Exercise is integral to most triathletes' lives; being advised not to exercise without alternatives can demotivate and harm their mental health (Daley et al., 2021).

Section 3.1:The Pharmacological Options

NICE guidelines (2022) prescribe paracetamol in the first instance, and if these are ineffective, NSAIDs, such as Ibuprofen or Codeine. However, current research indicates that NSAIDs, by blocking the inflammation and repair process, could make an acute injury

chronic (Parisien et al., 2022). There is already significant use of NSAIDs in triathletes (Gorski et al., 2009), where a study found a high prevalence of NSAID consumption for both the treatment of injuries and preventative purposes, with limited understanding of the effects/side effects, which can include gastric problems. It is an area where further research is required, as current evidence indicates they may not have the desired effect, resulting in delayed muscle regeneration and decreased muscle strength post-repair (Mackey 2012).

Section 3.2: Surgical Interventions

Surgical intervention is usually subacromial decompression or rotator cuff repair when treating either rotator cuff disease or impingement-related symptoms.

Subacromial decompression surgical intervention in England increased by 91% over the nine years to 2017. The University of Oxford's surgical trial (Beard et al. 2021) showed no difference in outcome between the two surgical groups undergoing decompression or placebo surgery. Therefore, this type of surgical intervention has subsequently been severely limited. This is backed by a recent Cochrane Review (Karjalainen et al. 2019), which concluded that "the use of subacromial decompression in the treatment of rotator cuff disease manifesting in painful shoulder impingement does not provide clinically important benefits over placebo in pain, function or quality of life".

Brindisino et al.'s (2021) research into rotator cuff tears demonstrated that surgical repair, compared to conservative treatment, could reduce pain and increase movement over specific periods, but on balance, there was no substantial evidence to support this. Chaudreya (2010) deemed the risk of re-rupture high in their review of surgical options for patients with SGP. Concluding that although rotator cuff repair can reduce pain and increase function for full-thickness tears, between 20-70% will re-rupture within six months. Neither did they find

evidence to support surgery for partial thickness tears, concluding that more research is required in this area.

Based on the above, the benefit of surgical interventions for rotator cuff disease is, at best, mixed. They potentially have little value and a greater risk of further injury. Further research is needed into this costliest treatment option.

Section 3.3: Corticosteroid injections

NICE guidelines (2022) state, "A corticosteroid injection may be considered for a person with SGP, depending on the suspected cause and the severity of symptoms." Very little evidence supports its efficacy from the Cochrane Review on corticosteroid injections for shoulder pain (Buchbinder et al. 2003). Elsewhere, a recent study by Lin et al. (2022) found a positive correlation between steroid injections and rotator cuff tears over seven times against a control group. This is further backed by Climico et al.(2020), whose SR concluded that repeated preoperative corticosteroid injection may increase retear rates and the likelihood of revision surgery.

The above suggests that using corticosteroids is not without risk and may have limited benefits in treating rotator cuff disease in athletes, as they could increase the risk of future rotator cuff tears.

Section 3.4: Physiotherapy

NICE guidelines (2022) advise six weeks of physiotherapy intervention, including "postural correction, motor control retraining, stretching and strengthening of the rotator cuff and scapula muscles and manual therapy." If the patient's symptoms improve, a further six weeks of treatment is also suggested.

Green et al. (2003), a much-cited review, concluded that its efficacy has yet to be established when looking at physiotherapy intervention for SGP. This is at odds with the more recent SRs (Pieters et al. 2020; Innocenti et al. 2019), which recommended manual therapy was beneficial in the initial treatment phase to help improve pain, function, and mobility in patients with SGP. However, Innocenti caveated that this is based on weak diagnostic clinical instruments, and there is a need to improve the coherence between diagnostics and treatment.

Chester et al.'s (2018) cohort study examined the psychological factors associated with the outcome of physiotherapy for people with SGP. It concluded better patient-rated results were achieved when assessing people's psychosocial and medical information.

However, Henning and Smith (2022) reviewed physiotherapists' ability to identify psychosocial factors and concluded that the available data indicated clinician confidence in psychosocial assessment needed to be increased.

The above indicates that although physiotherapy can help treat SGP, clinicians often need more skill to incorporate psychosocial factors into the treatment plan and achieve the best patient outcomes.

An SR undertaken by Hawk et al. (2017) reviewed the effectiveness of non-drug and non-surgical interventions for shoulder pain and concluded that exercise plus manipulation and mobilisation was beneficial for shoulder impingement and adhesive capsulitis but less for rotator cuff disorder and non-specific shoulder pain. This outcome is likely dependent on how the various shoulder pathologies are defined. As discussed above, diagnosis in this area is difficult. However, exercise plus manipulation and mobilisation can be beneficial, supporting the use of physiotherapy and massage therapy as alternatives to drugs and surgery.

3.5 Bringing it all together.

Interestingly, Diercks et al. (2014) reviewed the treatment of SAPS and concluded that it should be treated conservatively as there is no convincing evidence that surgical treatment is more effective, the effect of using corticoidsteroid in the long term is unclear and rehabilitation exercise is essential to aid recovery. This is primarily consistent with the above results.

Section 4: How do an athlete's mental health and social circumstances affect their recovery from injury?

Bescoby (2022) noted in his article that it is very apparent that little thought is given to the psychological impact that injuries can have on athletes; consequently, this is likely to harm their mental health and cause psychological distress, which affects rehabilitation and recovery outcomes.

Section 4.1: It is not all about the tissues! What about the psychosocial factors?

The current medical models, including the NICE guidelines, do not address any population's psychosocial issues when treating injuries. Purcell et al. (2019) lamented a lack of framework or care to support and respond to athletes' mental health needs.

Although there has been a significant amount of research on the psychology of athletes, there is minimal research on the psychological effect when they are injured; however, this is starting to change. Daley et al. (2021) concluded that sports injuries can cause psychological distress and precipitate the emergence of new or exacerbate existing psychological disorders. Additionally, it concluded that further work is required on the "complex interplay between psychological and physical health in the setting of an injury is essential to optimise patient

care." Aron et al. (2019) recognised that post-traumatic stress disorder can be initiated by an athlete suffering a direct physical injury.

Kellezi, Copeland and Morris (2017) investigated the role of psychological predictors following injuries in working-age adults and the effect on injury rehabilitation. They concluded that "identifying and managing depression is essential in clinical care post-injury.' Moreover, Reardon et al. (2019) issued an Olympic Committee consensus statement on Mental Health in Elite Athletes, which confirmed that poor mental health and physical health are intertwined both in increasing the risk of physical injury and delaying recovery. They stated that when examining an athlete's management strategies, "they should address all contributions to mental health symptoms and consider Biopsychosocial (BPS) factors relevant to athletes to maximise benefits and minimise harm". Reardon recognises that the framework for non-elite athlete environments with even less support needs reworking.

Fosdyke et al. (2016) reviewed 25 studies on competitive athletes, psychosocial factors, and sports injury rehabilitation, concluding that psychosocial factors were associated with injury rehabilitation outcomes. They also concluded that injured athletes' thoughts, feelings, and actions may affect the rehabilitation outcome. Kilic et al. (2017) study looked at severe MSK injuries in footballers and whether there was any correlation between these and mental disorders. However, no direct relationship was identified, but the study emphasised the need for a BPS approach when rehabilitating injuries.

The above reflects the recent cognisance that physical and mental health are interlinked and can significantly affect injury rehabilitation. It is already an area marked for further research and guidance. The Olympic Committee's review and the many recent high-quality SRs should provide the momentum to understand the area better and bring the results into the mainstream when treating injured athletes.

Section 4.2: How do mental health issues manifest in injured athletes?

Daley (in Bescoby 2022) noted that psychological responses to injury in athletes could manifest in several ways, including “negative emotions, mood disturbances, fear of re-injury, failure-based depression, devastation, reduced confidence and restlessness.” Reardon et al. (2019) added sleep disorders, sleep concerns, anxiety-related disorders, post-traumatic stress disorder, eating disorders, and behavioural addictions.

The effect of social factors can also not be ignored when looking at injury rehabilitation, as they are likely to impact the athlete’s mental health. Nixdorf, Frank, and Beckmann (2015) identified that these can include external factors such as the support of family and friends, more unstructured free time, and the effect of being able to work.

Section 4.3: Can Therapeutic Alliance help?

Podlog, Neil, and Schulte (2014) concluded that the athlete’s injury rehabilitation was primarily influenced by the athlete-practitioner interactions (the therapeutic alliance) and the effectiveness of social support provisions. They recognised how injury can be highly disruptive to athletes, as sport is often central to their lifestyle and identity. Their examination of research literature also led them to conclude that the athlete’s thoughts, emotions, and behaviours influence the injury rehabilitation process.

This accords with Kelley et al. (2014) and Kaplan et al. (1989), who recognise that a critical part of facilitating a client’s wellness is the therapeutic alliance. Ferreira et al. (2013) further supports this. Additionally, Gillingham‘s (2017) small-scale study demonstrated that developing the therapeutic alliance between patient and practitioner had a beneficial effect when treating clients.

Section 4.4: The Way Forward

Based on the above, there is a requirement for a multidisciplinary BPS approach to injury rehabilitation, as it is instrumental in athletes' faster return to competition. This includes clinicians working with the athlete to develop self-management skills to cope with psychological stresses and support the athlete's rehabilitation. This approach recognises the importance of the therapeutic alliance between clinician and athlete. (Fosdyke et al. 2016; Kilic et al. 2017; Reardon et al. 2019). Additionally, Heaney et al. (2015) suggested that adopting the BPS model in injury rehabilitation can positively impact the athlete by increasing factors such as patient satisfaction, pain management and empowerment.

As noted above, there are deficiencies, and further questions need to be answered regarding the benefits of the current medical models for treating SGP. This opens the area for alternative, less invasive approaches, giving athletes greater control over their injury management. Understanding the multifaceted nature of the injuries and the complex interplay with the BPS model is crucial for designing effective treatment and rehabilitation strategies, which is arguably missing from the current treatment protocols.

Section 5: Massage and Chronic Shoulder Pain

Section 5.1: The supporting evidence for massage for SGP

Bervoets' (2015) work found that massage treatment helps improve function and reduce pain for some MSK conditions, including SGP. This backed up Van den Dolder and Roberts's (2003) research, which concluded that soft tissue massage around the shoulder helps improve pain, function, and ROM in patients with SGP. Later work by Van den Dolder et al. (2015), which compared the effects of soft tissue massage and exercise with those patients receiving

only exercise, showed a slightly favourable difference in the group receiving exercise only. This was a relatively small study and consequently can be differentiated.

Following two studies, Yeun (2017) concluded that massage therapy significantly reduced SGP in both the short and long term, effectively improving abduction and flexion at the GHJ. The availability of data was sparse; therefore, it was noted that more research was required, and an RCT or large sample using a standardised massage approach was recommended.

Other reviews looked at massage and chronic pain but were not specific to SGP.

- Crawford et al. (2016) undertook an SR and MA of RCTs, which recommended that massage be used as a pain management option. They noted that no standard definition of massage therapy was used in the studies, making comparability difficult.
- Miake-Lye et al. (2019) examined the evidence available for the use of massage in various painful conditions. Despite reviewing 49 SR, they concluded that a lack of primary large-sample-sized studies and a lack of detail on the massage therapy provided limited their ability to draw conclusions.
- Keeratitanont et al. (2015), Hernandez-Reif et al. (2001), and Cherkin et al. (2011) provide further positive evidence for massage reducing chronic pain.

In conclusion, although higher quality, more extensive sample reviews looking at specific massage modalities are required, work that has been undertaken to date supports the use of massage therapy when dealing with chronic pain.

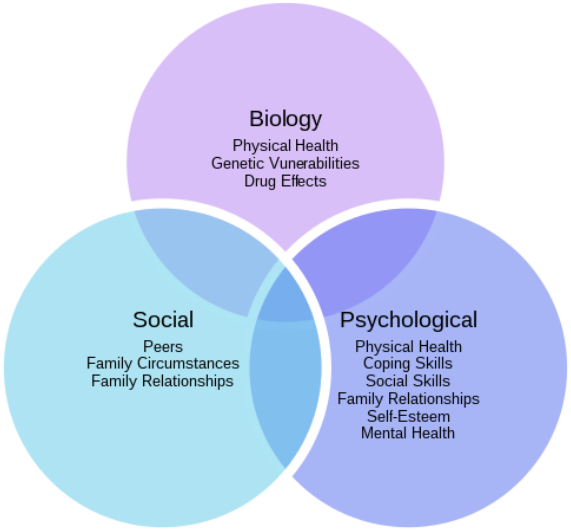
Section 5.2: The JMACM

Fairweather and Mari (2015:3) subscribe to Gestalt's psychology theory, whereby the whole of anything is more significant than its parts. This led them to develop a multi-modal treatment combining several different skills, each skill reinforcing the others, resulting in the

HFMAST (“Heat, Fascial Techniques, Muscles, Acupressure Points, Stretching, Teaching”) massage protocols (2015:6).

They also recognised the importance of an excellent therapeutic relationship between patient and therapist (2015:56) and are strong proponents of the benefits of the intertwined elements of the BPS model of biology, psychology and social context being bound up in maximising health outcomes (2015:34) This coupled with a detailed consultation (2015:4) and assessment (2015:55) Fairweather and Mari (2015) argue will produce the best clinical outcome for their patients.

The Biopsychosocial Model of Health (Wikipedia 2024)



Section 5.3: Evidence supporting the Jing HFMAST Protocol

Looking at each element, what evidence supports this approach?

H = Heat

Lee et al.'s (2011) study suggested that heat and massage applications relax the autonomic nervous system. This accords with the work by Davis et al. (1998) and Yasui et al. (2010). Additionally, heat has been shown to improve ROM (Nakano et al.2012).

F = Myofascial Release ("MFR")

A growing body of evidence supports using MFR techniques to increase ROM and reduce pain. In Guo et al.(2022), SR looked at the use of MFR in patients with chronic neck pain and concluded it was beneficial, although evidence levels were low to moderate. This is further backed by Ajimsha et al. (2014), who concluded that MFR "is emerging as a strategy with solid evidence and tremendous potential". Ajimsha and Shenoy (2019) also critically appraised the recent research trials and reviews, finding them to be of moderate quality and subject to some interpretation bias and procedure weaknesses, but encouragingly noted that the more recent studies had improved. They hoped the recommendations from the review would lead to further research. The body of evidence backing the use of MFR to reduce pain and increase movement continues to grow (Born et al., 2011).

M = Trigger Points ("TP")

Fairweather and Mari (2015:115) advocate the benefit of this and describe it as "a seemingly magical component". Evidentially, Hains et al. (2010) undertook a favourable small-scale clinical trial using TP, suggesting that using ischemic pressure on SGP reduced pain. An RCT

(Muggenborg et al. 2023) found favourable results for TP work in the Orofacial area. This is further supported by numerous other trials (Bron et al. 2011; Shah et al. 2015).

A = Acupressure

Adding an Eastern element to the Jing Protocol, acupressure has been used for thousands of years, and a substantial body of evidence supports its use. When treating SGP, it assists in pain relief (Chen and Wang 2014; Makvandi et al. 2020).

S = Stretching

The significant evidence for using stretching for neck and shoulder pain includes RCTs (Tunwattanapong et al. 2016; Tahran and Yeşilyaprak 2020). Tedla and Sangadala (2019) undertook an SR looking at pain and movement in patients with adhesive capsulitis. They found that PNF stretching techniques decreased pain and increased ROM on external rotation and abduction.

T = Teaching

A recent study by Nemati et al. (2023) looked at the benefits of massage therapy as self-management, and although the studies reviewed covered single sessions to 8-12 weeks of self-treatment, a high proportion of the studies showed improvement in MSK conditions.

Section 5.4: Evidence Supporting the JMACM for SGP

Several small-scale studies have recently been undertaken using JMACM to treat SGP. All the studies show the beneficial effects of the treatments, identifying both pain reduction and disability improvement. Several of the studies were face-to-face (Donate, 2023; Harte, 2023;

Murdoch, 2023; Chung, 2018; Harwood, 2018; Mistry, 2016), which all noted a significant reduction in pain and increased function. Although each study was small, the consistent results give weight to the outcomes, although a much larger study would add more significant evidence. The fact that all the studies used the same Jing Protocols gives credence to the findings as the total number of participants exceeded thirty. This can be compared to many SRs on the benefits of massage, which identify no standard definition of massage as a weakness (Yeun 2017; Crawford et al. 2016; Miake-Lye et al. 2019).

The studies conducted online due to COVID restrictions (Cleeve 2021; Watson-Bance 2021; Kudmany 2020) had thirty-one participants cumulatively and had positive results, with reductions in pain and increased ROM. These, albeit small, studies indicate that with proper guidance, larger groups of people can be treated remotely using the same protocols adapted to include self-massage rather than therapist-delivered massage.

As the treatment is non-invasive, there are limited risks of side effects associated with clinical massage therapy. This potentially has far-reaching outcomes when dealing with long NHS waiting lists, saving time and money. It also encourages patients to take control and own the pain, injury, and rehabilitation.

Section 5.5: The JMACM's place in treating athletes with SGP.

The JMACM pulls together the various elements of successful treatment of SGP and arguably provides the missing pieces in the current treatment protocols. Using the detailed consultation process and orthopaedic testing incorporates a significant aspect of the initial treatment process undertaken by a physiotherapist. Add in the importance placed on establishing a therapeutic alliance by JMACM; this aids in allowing the patient to feel listened to, which has been proven to improve clinical outcomes and incorporates the BPS model.

Each of the elements of HFMAST has been separately evidenced to be beneficial in improving clinical outcomes individually; the combined effect has been promising when reviewing the results of the small-scale clinical trials.

Including the teaching element is also highly beneficial for athletes keen to take control of their rehabilitation.

The JMACM provides an alternative, non-invasive, cost-effective approach that leaves the nexus of control with the athlete. It is a fitting alternative to the current treatment protocols for athletes with overuse injuries.

Discussion and Conclusion

The previous sections demonstrate significant evidence that the treatment methodologies for athletes with SGP must be improved. However, this is due to several issues.

Firstly, the complexity of SGP resulted in academic discussion over the definitions of pathologies and aetiology, making diagnosis and treatment so much more difficult. Comparability of studies is complicated because one person's subacromial impingements syndrome is another person's SAPS, which makes obtaining meaningful results from reviews difficult. To make sense of the research, it is essential to look at the expected conclusions, one being that the most common overuse injury in shoulders relates to abduction and overhead movement patterns, prevalent in triathlon. The exact reason for this is not fully understood but usually originates from problems arising between the humeral head and the acromion. The lack of consensus relates to the effect of SRy and SD dysfunction as an underlying cause. Confusion over the aetiology is likely to result in treating the symptoms,

not the cause, resulting in a reoccurring pathology, which is detrimental to the athlete's training regime.

Secondly, the lack of research into triathlon-related SGP makes it necessary to widen the search criteria to include swimmers and other "overhead athletes". The available research did not differentiate between Sprint and Ironman triathletes, whose training regimes were significantly different, making it difficult to conclude. The research indicated that most shoulder pain experienced by triathletes comes under the SAPS umbrella. However, the lack of consensus on the underlying cause means that SGP is likely a persistent problem for many triathletes. This is backed by the researcher's experience in the clinic, where approximately 10% of the client base are triathletes. This has shown that regular post-injury massages and continuation of rehabilitation exercises have successfully kept the triathlete SGP-free.

Thirdly, the current medical models need to be more conducive to allowing patients to recover faster. The NHS aims to provide diagnostic testing within six weeks, but this still needs to be met in 25% of cases (Baker, 2023). There are also questions over the efficacity of some treatments, specifically corticosteroid injections and surgical interventions. As these are likely to be the treatment modalities with the most extended waiting times, it seems beneficial to consider more conservative options such as physiotherapy and massage in the first instance to return the athlete to training and competition as soon as possible. The wide use of NSAIDs by triathletes may also be hindering the repair process due to a lack of awareness of the potential issues.

Fourthly, the current medical protocols do not consider the BPS approach, including the benefit of a solid therapeutic alliance. There is a lack of mainstream recognition of how important it is for athletes' mental health, as identified by current research. It identifies the benefit of incorporating the BPS model in rehabilitation. However, the integrated approach

lacks availability and investment at all levels. Of the treatment protocols prescribed by NICE, physiotherapy will likely provide the treatment modality with the most face-to-face time with the athlete. However, research shows that practitioners were not confident in carrying out a BPS assessment; this is likely to be omitted in a significant proportion of cases and potentially affect patient outcomes.

The use of massage treatment on SGP is evidence-based, and specifically, the JMACM of massage in the treatment of SGP has proven effective in small-scale studies. It has the benefit of incorporating the missing BPS element and helping the patient have some control over the injury management by including rehabilitation and self-care work as part of the treatment plan. The use of a prescribed protocol makes comparison between studies much easier, avoiding the pitfalls discussed in many reviews which assess the use of massage as a modality to deal with chronic pain. Although massage was shown to be beneficial, the lack of a standard definition of massage made comparability between studies complex and the absence of a standard definition of massage made comparability between studies complex and, combined with a lack of large-scale studies, weakened their evidential value.

The availability of Jing-trained therapists can provide a timely, cost-effective alternative to either NHS treatment or private physiotherapy sessions. Even if a more invasive procedure is necessary, massage and rehabilitation work could aid recovery and allow the athlete to continue to train in the interim.

Limitations and reflections

What seemed like a relatively straightforward pathology, which practitioners deal with daily, is subject to much disagreement amongst clinicians and researchers. This only became apparent following an in-depth review, which highlighted the need for more consistency of definition and diagnostics between the different shoulder pathologies. The lack of

understanding of the aetiology of chronic SGP was surprising, making successful long-term treatment more difficult. The treatment protocols deal with the symptoms without a complete understanding of the underlying cause. It was very difficult to restrict the research into this area as each piece of research reviewed raised more questions.

The review of each treatment protocol and the research findings identified that there is often not a single answer to how to treat a patient; the research helped clarify how important the multimodal approach, including the psychosocial elements, was to working with injuries and obtaining better patient outcomes.

Although the paper specifically examined athletes, most of its findings could be applied to the general population. The review helped the Clinician better appreciate the principles of JMACM Treatment Protocols and how they can provide an alternative or additional treatment modality for shoulder-related overuse injuries.

Recommendations

These are explicitly based on using massage for the treatment of SGP.

More high-quality, evidence-based papers looking at massage as an alternate treatment source are needed, although small-scale studies have demonstrated its usefulness.

When conducting trials, an agreed-upon definition of massage therapy should be used, and different modalities should be separately identified to aid comparability between studies.

The benefit of having set protocols, as used by the JMACM, should make it easier to set up larger-scale trials with one year group all looking at the same pathology. This would be advantageous, as Jing students are subject to identical training, whereas other studies can lack comparability. This is being achieved indirectly by several small-scale studies covering the

same pathologies and protocols. Over several years, the evidence base will continue to expand in size and evidential strength.

Conclusion

This study has shown that there is a lack of knowledge explicitly relating to triathletes and SGP; significant questions remain regarding the consistent diagnosis of shoulder pathologies; the current medical model is also often not fit for purpose when treating athletes and generally does not consider the benefits of the BPS model. These areas all need further study.

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