JOINT HYPERMOBILITY SYNDROME:

This article will introduce you to the world of Joint Hypermobility Syndrome and its many facets. It will look to enhance your knowledge on one aspect of the condition, whilst covering additional aspects in greater depth at the ATRI Symposium in June. In addition it will give a brief outline of its prevalence, some of the problems relating to the condition plus evaluating the benefits of working in water that someone with hypermobility might gain.

Joint Hypermobility Syndrome (JHS)/ Elhers-Danlos Syndrome-Hypermobility Type (HEDS) formerly EDS III aka JHS/ Benign JHS (BJHS) is a barely recognised and often poorly managed multi systemic Hereditary Connective Tissue Disorder (HCTD). (The pathology of the condition will be covered in greater depth at the ATRI Symposium at Sanibel in June). The term hypermobility is used to describe the ability to move joints beyond their normal range of movement.

There are 311,000 Americans diagnosed with JHS, with 95% of sufferers remaining undiagnosed or misdiagnosed due to oversight or lack of knowledge about the condition. That equates to 650,000 Americans going undiagnosed per year according to a study by Professor Rodney Grahame in 2011. However, it is known that approximately 20-30% of individuals are affected by hypermobility to some degree (HMSA 2012).

Hypermobility can affect a person either focally, regionally or cause widespread mechanical injury (Hakim et al. 2010. p3). The condition is most common in childhood and adolescence, in females, and in Asian and Afro-Caribbean races (Hakim et al. 2010. p5). In some individuals there may be no medical significance from having this condition, yet for others it can prove to be surprisingly advantageous (HMSA, 2006; Grahame, 2010). A vast majority of individuals with JHS are asymptomatic with no medical conditions or diagnosis, it is simply the way they are born. However, the individuals who are symptomatic can have life changing symptoms and altered

function with health professionals using a variety of tests to 'diagnose' the condition.

The problems related to JHS can interfere with activities of daily living, and/or schooling or work. The pain associated with this can become widespread and persistent and any joint within the body can be hypermobile. Clues to the condition can result from individuals feeling that a joint 'clonks' (subluxes) during movement or even dislocates when there has been no trauma.

Hypermobile individuals can injure their joints, ligaments, tendons and other 'soft tissues' around the joints. This is because the joints twist or over extend easily (Keer and Butler 2010). Though these injuries may cause immediate 'acute' pain they can often lead to longer-term 'chronic' pain. It is quite common for a JHS person to repeatedly injure parts of their body and bruise from insignificant injuries. These injuries tend to heal more slowly than normal, with scarring that looks thin and wrinkled (Levy 2012). Individuals will often explain they are 'clumsy', have poor balance or that they are uncoordinated.

This 'clumsiness', lack of balance and poor coordination can be explained by the diminished proprioception in individuals with this condition (Mallik et al. 1994; Hall et al. 1995). It can also have a significant effect on the way an individual moves. Ferrell and Ferrell (2010) have shown that both joint positioning and the detection of movement is reduced in individuals who are hypermobile leading to less awareness at joint end of range. The specific reasons for this is unknown, however, it may be related to the increased laxity and elasticity within the tissues. Notwithstanding, when working with individuals with JHS, the effect of pain and injury should be considered.

With this information, when planning an aquatic programme all the symptoms that may be affecting the individual and what results the individual may be looking for need to be considered.

My job in the UK is injury prevention, rehabilitation and prevention of further injury in the case of chronic conditions. Water therapy/exercise can enhance retraining in the chronic, long standing and recurrent physically deconditioned hypermobile individual. It is imperative that the aquatic professional who instructs a class or individual with this condition is confident in joint ranges of motion.

Hakim (2012) wrote that rehabilitation on land took on average 12-18 months from start of the correct treatment interventions, with some of the patients taking proportionately longer. He also stated that for some, rehabilitation would be ineffective (up to 20%). However, in my experience, the average period of retraining in the pool takes between 12-24 months from initial inception. Maintenance of wellbeing is life-long for these individuals and as such it is common that once an individual has found water exercise, the benefits are substantial and they choose to continue such exercise as a lifestyle.

In some cases breathing can cause pain and injury, therefore training for breath control can be gained through Ai Chi with the tactile effect of water providing the necessary feedback to allow the hypermobile individual to inhale and exhale fully with control and without fear. Some individuals have also reported rib dislocation, especially when coughing, therefore, control over the intercostal muscles through deeper learnt breathing will improve quality of life.

In Sahin et al's. (2008) study they found that decreased muscle tone, tensile power of tendons and degeneration of ligaments contribute to functional impairment by causing abnormal motor control and proprioceptive feedback loss. Whereas, decreased endurance can be attributed to weakness of proprioception and frequent injuries. As a result, re-education, good movement patterns and motor control should start with the education of postural alignment. For some hypermobile individuals maintaining a standing and sitting posture for any period of time can be a challenge because their

postural muscles are unused to holding joints in a neutral position. Endurance muscles become easily fatigued and need to be built up gradually. As water gives support in a non-gravity environment, joint loading is decreased allowing effective and efficient joint control without pain.

Whilst standing on one leg (not always possible) an individual with JHS will usually reveal exaggerated sway and/or loss of balance due to poor stability and control. Observation can be made when performing this test/exercise into load transfer through the lower limb, hip and pelvis. Ogden's (2007) article in the Aquatic Therapy journal, suggested that in a one-to-one situation whilst holding the clients hands, it is possible to detect muscular tension within specific areas. This skill will allow for recognition of muscular imbalance which leads to inhibiting recruitment patterns.

In a group exercise situation, it is by performing isolation exercises on one leg, then adding oppositional dynamic exercises with the other that muscle balance and strength can start to be regained. It is isolation followed by coordination that assists in neural learning and increased proprioceptive input. Activation of muscles is practiced with pelvic neutral alignment and relaxed breathing. This will prevent bracing and rigid movement strategies, common tactics used in hypermobile individuals (Keer and Butler 2011 p.152). Furthermore the addition of movement will increase trunk and pelvic stability and endurance.

Though symptoms relating to JHS are multiple, lower back pain is a common occurrence with medical evidence to validate the efficacy of aquatic therapy/exercise in its management (Olson et al. 2012). However, Baeno-Beato et al's. (2013) research has shown that in chronic lower back pain sufferers, attending aquatic therapy three times a week is the optimal amount of times an individual should be treated to decrease pain and disability and increase health related parameters. From this study it would be reasonable to assume the same results would occur in the JHS population.

Once control has been gained over the postural muscles peripheral joints and muscles can be targeted. Initial rehabilitation training should be in a non-weight bearing, closed chain environment as recommended by Keer and Simmonds (2007); and Keer and Butler in Hakim et al. (2011 p153). This will have a beneficial effect on the rest of the kinetic chain as well as positional awareness. For individuals with JHS gaining control over knee extension/hyperextension is vitally important as repeated microtrauma might contribute to the development of degenerative joint disease such as osteoarthritis (Hall et al. 1995). The movement of water around the extremities whilst performing front to back and side to side exercises, will allow for neural learning and increased proprioception when performed slowly with a higher number of repetitions. By adding the aquatic noodle a higher degree of difficulty will be experienced. It is by using the limbs in an effective way that a hypermobile individual will reduce pain, improve proprioception, muscle strength and improve quality of life (Ferrell et al. 2004).

It is evident that aquatic therapy has many benefits to the hypermobile individual as a lack of proprioception can result in poor gait, frequent falls, and general clumsiness often resulting in injury. As a consequence it is common for the hypermobile individual to suffer from anxiety and Kinesiophobia which has a profound effect on the individual's quality of living and contribute to a repetitive injury cycle of pain, non-movement and rehabilitation. At the ATRI Symposium in June we will look further into the condition of JHS, and how to design a programme for water exercise/therapy to improve quality of life whilst reducing Kinesiophobia by targeting stability, cardiovascular conditioning, muscular strength and endurance.

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