Electrical twitch obtaining intramuscular stimulation (ETOIMS) for myofascial pain syndrome in a football player

J Chu, I Takehara, T-C Li, I Schwartz

Background: Flare up of acute lower back pain associated with myofascial pain syndrome (MPS) may require various forms of treatment including activity restriction and bracing. Electrical twitch obtaining intramuscular stimulation (ETOIMS) is a promising new treatment. It involves the use of a strong monopolar electromyographic needle electrode for electrical stimulation of deep motor end plate zones in multiple muscles in order to elicit twitches.

Case report: An elite American football player with MPS symptoms failed to respond to standard treatments. He then received ETOIMS which completely alleviated the pain. After establishing pain control, the athlete continued with a further series of treatments to control symptoms of muscle tightness.

Conclusions: ETOIMS has a promising role in pain alleviation, increasing and maintaining range of motion, and in providing satisfactory athletic performance during long term follow up.

The only well established risk factor that predisposes athletes to recurrent injury is previous muscle strain. Past lower back pain increases the risk of a later recurrence of back pain and lower limb muscle strain injuries. Our case presentation highlights the use of a novel technique termed “electrical twitch obtaining intramuscular stimulation” (ETOIMS) in an elite American football player to alleviate myofascial pain and improve athletic function.

DISCUSSION

Tender myofascial trigger points in MPS which produce referred pain and a local twitch response on snapping palpation are identical to motor end plate zones. Treatment of tender myofascial trigger points includes injections such as local anaesthetic, steroids, and botulinum toxin, but injections have a limited role when multiple trigger points in many muscles need chronic repetitive treatments. Through limiting the role of oral or injected drugs for pain relief and functional restoration, ETOIMS has a decided advantage in sports related recurrent MPS. It is contraindicated for patients with local or systemic infections, autoimmune deficiencies, and bleeding disorders.

Limitations of acupuncture with or without electricity, percutaneous electrical nerve stimulation, and intramuscular stimulation include inability to stimulate deep motor end plate zones. These procedures employ acupuncture needles with a diameter of 0.25 mm and lacking in tensile strength. Such needles are unable to traverse thickened or tight tissue. The stiffer and stronger monopolar EMG needle electrode used in ETOIMS, with a diameter 0.41 mm, allows treatment to deeper muscle layers.

Stretching of tight muscles and massage are common in rehabilitation to relieve pain, muscle tension and tenderness.
and to enhance the range of motion. However, active physical training exercises are more useful than stretching in adductor muscle strains. Twitch contractions of ETOIMS deliver precise and effective neuromuscular training by brief active mobilisation and focused stretching of shortened deep muscle fibres at multiple treatment sites not readily accessible with standard treatments. Twitch muscle contractions with low frequency stimulation (3 Hz) also increase blood perfusion.

Proprioceptive and sensorimotor stimulation of subconscious and automatic reflexes can provide activation of gluteal muscles to restore strength and gain pelvic stability in chronic lower back pain. Muscle contractions associated with ETOIMS can stimulate deeper motor end plate zones and potentially provide more effective activation of mechanoreceptors in joint ligaments.

A decreased range of motion may be caused by muscle shortening or pain, and muscle shortening predisposes to pain. FABERE assesses the flexibility of major muscles crossing the hip, knee, and lower back and is impaired in lower back pain. In spite of complete pain relief after 10 ETOIMS sessions, FABERE continues to be limited in our patient, indicating that chronic muscle tightness is more difficult to treat and may predispose the athlete to recurrent injuries. Although pain-free, the patient chose to continue long term ETOIMS treatment for symptoms of muscle tightness which helped to maintain range of motion, avoided pain recurrence, and provided satisfactory athletic performance.

**Take home message**

- Because of its ability to treat tender myofascial trigger points in many muscles, electrical twitch obtaining intramuscular stimulation (ETOIMS) has a place in treating sports related recurrent myofascial pain syndrome.
- In this case report, ETOIMS alleviated pain and improved athletic function in an elite football player whose symptoms failed to respond to standard treatments.

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