Why a sports person's timing may be "out", or be out of form

Summary

Most sports rely on some sort of muscular coordination and timing. Typically the brain receives some sort of stimulus or information. This is interpretted and processed, then signals are sent to the muscles causing them to take some action. What would happen if the brain sent out signals but the muscles were slow to react? Researchers found that this is exactly what happens when muscles contain myofascial trigger points (trigger points).

The trail

What the researchers did

The researcher chose 15 healthy women with a trigger point in their upper trapezius muscle, and matched them 15 similar women without such trigger points. These women were asked to stand upright with their arm slightly forward (shoulder flexed) holding a cable attached to a weight. The women were instructed that when they heard the audio stimulus (a sound) they were to lift their arm holding the weight to shoulder height as fast as possible. The researchers were able to measure the timing of the nervous response using surface electromyography (EMG) and the response of the muscles using force pads. Details follow.

Muscles monitored

The lifting of the weight from a standing position requires the coordinated effort of many muscles. Because of this the researchers used surface electromyography (EMG) to detect signals to the following muscles:

- anterior deltoid
- upper trapezeus
- gastrocnemius
- lumbar paraspinal
- cervical paraspinal
- sternocleidomastoid

The action of the muscles

In order to detect the action of muscles various sensors were used such as one attached to the cable, force pads in the platform subjects stood on, and others monitoring muscle action in the body.

What they found

The reaction time of muscles is made up of two parts. The first part is the time taken to when the muscle receives it's nerve impulse. The second is the time from when the nerve impulse is received to when the force is generated. The researchers found that the presence of trigger points the time taken for the nerve impulse to arrive was unchange, but the time taken for the generation of force was increased. In other words, the muscles received their instructions normally, but were slower to react.

Discussion of the results

In other research summarised in this guide we have seen how as a result of trigger points:

- muscles will be tight and fatigue easily,
- other muscles will be recruited in compensation, and
- the coordination of muscles can be completely changed.

This research shows us that they will also be slow to react to. The coordination involved to play any sport is highly complex, but looking it simply it means that trigger points will slow reaction times and timing. For example, in tennis it would result in the racquet arriving late, miss-hitting the ball or missing it all together.

Screening and treating trigger points

Thoughout this guide we have detailed several adverse affects of trigger points for those who play sport and exercise. The slowing of reaction times with the resultant affects on timing and coordination are yet another. Earlier in this guide we discussed how the use of vibration massage can help treat trigger points. We recommend the best way to get these benefits and keep trigger points at bay is for those playing spots and exercising to be examined and advised by a professional who deals with musculoskeletal conditions then implement regular self/home use. This is analogous combining regular dental checkups with daily brushing and flossing.

Reference

Yassin, M., et.al. Arm Flexion Influence on Muscle Reaction Time in Females with Active Myofascial Trigger Point. British Journal of Applied Science and Technology, 2015 11(1): 1-9

Further information

For further information we have a large number of usage guides and research summaries on our website www.drgraeme.com If you are a practitioner interested in trying vibration massage please contact us directly for further information, practitioner rate massagers and possibly a sample massager.

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