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PostScript

LETTERS

Runner's stitch and the thoracic spine

The cause of the abdominal pain commonly referred to as "stitch", but more accurately known as exercise related transient abdominal pain (ETAP), had until recently attracted more speculation than research. Explanations for the pain have included diaphragmatic ischaemia,[1] stress on peritoneal ligaments,[2] and irritation of the parietal peritoneum.[3] Although the exact cause of the pain remains to be elucidated, a neurogenic explanation has not appeared in the literature.

We present the case of an elite runner who, after a thoracic spine trauma, developed severe and recurrent episodes of ETAP which were relieved by localised treatment. As a follow up study, we made observations on 17 other runners who often experience episodes of ETAP and found that palpation of specific facet joints could reproduce symptoms of ETAP shortly after an episode of the pain had been relieved.

Case study

The patient was a 25 year old man who had been actively involved in competitive running for about 16 years. During this time, he claimed that he occasionally experienced mild symptoms of ETAP during training and competition, although they were not disruptive to performance. After trauma to the thoracic spine in a trampoline accident, he began to experience ETAP with greater frequency and severity. Subsequently he would develop ETAP often when walking and consistently when running. The presentation of the pain essentially forced him from competition. He had received advice from several medical practitioners before being referred to our clinic about two years after the trauma. Symptoms had been present and persistent when running was attempted for this time period.

On questioning, it became apparent that several conditions that stress the spine exacerbated the experience of ETAP. For example, torso hyperextension coupled with the jolting movement of downhill running provoked the pain. In addition, tight erector spinae after a surfing session seemed to increase the likelihood of experiencing ETAP.

On assessment, vertebral hypomobility was observed at the T7–T8 level, presumably as a result of the trampoline accident. Accompanying this was hypermobility of the T8–T9 joint. Palpation of the left T8–T9 facet joint resulted in reproduction of subcostal pain consistent with the patient's exercise induced experience of ETAP. Further, the site of the pain reproduction was consistent with the dermatome distribution arising from the T8–T9 level. Palpation of the joints above and below the joint caused no pain referral.

Localised treatment aimed at mobilising the T7–T8 joint was administered in the clinic, and the patient was given mobilising exercises to perform. After about four weeks of treatment, he reported a reduction in the symptoms of ETAP. He has since resumed competitive running.

Further observations

In response to the presentation of this case, we recruited 17 other runners who spasmodically experienced ETAP during training and competition. Ethical clearance was obtained from the Avondale College human research ethics committee. The subjects exercised on a treadmill after a meal until ETAP developed, at which time the exercise session was terminated. After the pain had completely disappeared, the subjects lay in a prone position and were submitted to a spinal assessment, in which facet palpation was performed along the length of the thoracic region. The subjects were not informed of the intent of the study but were asked to volunteer any symptoms of pain or discomfort that arose.

In eight cases (47%), the exact previous experience of ETAP was reproduced through palpation of the thoracic spine at various levels from T8 to T12. In another six cases (35%), the subjects reported lateral and anterior pain referral towards the site of ETAP as a result of the palpation. The longitudinal site of ETAP along the abdomen correlated significantly with the level of the thoracic spine producing symptoms on palpation. This result was observed when only the subjects reporting exact reproduction were analysed ($r = 0.78$, $p<0.05$) and also when all subjects reporting any form of pain referral were included in the analysis ($r = 0.63$, $p<0.05$). Further, the level of the spine producing symptoms on palpation and the site of ETAP were consistent with dermatome distribution.

Discussion

There has been little or no mention in the literature of the possible role of the spine in the cause of ETAP, although there are several observations that indicate that its contribution may be noteworthy. Firstly, in 1941 Capps[1] anecdotally observed that people with an increased kypholordotic postural alignment seemed most susceptible to the pain. To investigate this further, we recently confirmed in a study involving a comprehensive postural assessment of over 150 subjects that increased kyphosis is provocative of ETAP.[4] This observation is interesting given that intercostal nerves arising from the thoracic region supply the anterior abdomen. In addition, it has been suggested that "jolting" of the torso is primarily responsible for evoking the pain,[2] and this action is known to result in intervertebral compression.[5] As a side issue, we documented that horse riding is one of the sporting activities most likely to induce ETAP.[3] It has also been asserted that an episode of ETAP can be relieved through body inversion.[2] Finally, we have argued that the characteristics of the pain, being well localised, lateral, and mostly sharp, are consistent with somatic rather than visceral abdominal pain.[6] An explanation for the pain involving the intercostal nerve would account for these pain characteristics.

The extent to which the thoracic intercostal nerves may contribute to the experience of ETAP is worthy of further investigation. It seems plausible that, in some cases mechanical compression of the nerve root may refer pain distally, resulting in abdominal pain. Alternatively, irritation of the nerve may sensitise it to stimuli such that the threshold required for activation is lessened. Hence, in this study, palpation after the pain had been relieved may have allowed tissues innervated by the intercostal nerves, such as the abdominal musculature or parietal peritoneum, to recreate sensations of pain.

Although the significance of the observations documented in this report remains to be fully elucidated, they do indicate that the spine may play a role in the genesis of ETAP. Further studies are required to determine the extent to which the spinal nerves are involved and the potential benefits of improving spinal integrity in ETAP sufferers. Certainly, the spine should be considered when treating patients with recurrent symptoms of ETAP.

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Science versus opinion

Dr Berger recently responded[1] to my article in the *British Journal of Sports Medicine* entitled: Berger in retrospect: effect of varied weight training programmes on strength.[2] Dr Berger presented no scientific evidence to support his opinion on single versus multiple sets, cited references that were irrelevant to the topic, and challenged the reported statistical analyses.

Dr Berger claimed that most athletic and therapeutic professionals have added credence and support to the belief that multiple sets are required for optimal gains in strength because they use multiple sets in their practice and research (p 372).[1] However, just