Cold Backed and Girth Shy (Cinchy) Syndromes in Ridden Horses: Could Mechanical Allodynia, a Common Consequence of Spinal Trauma, be a Contributing Factor

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Abstract: Colloquial terminology which included horses being described as 'cold backed','cinchy' or 'girthy' was commonplace in the sports horse industry. Explanations as to why horses should present with these altered behaviours included poor fitting or incorrectly applied tac, poor training, inexperienced or overweight riders, local trauma, as well as a limited number of medical conditions which included overriding of the dorsal spinous processes. The possibility that a proportion of these behaviours were alternatively, an exaggerated response to normal or innocuous pressures being applied to anatomical regions where mechanical allodynia was evident was discussed. The origins of this regional allodynia were also proposed and responses to treatment using cervical vertebral mobilisation under anaesthetic presented.

Keywords: Cold backed, cinchy, girthy, horse, mechanical allodynia, saddle fit.

INTRODUCTION

In human medicine when patients presented with altered neural sensations, which include mechanical allodynia [1], both local neural trauma as well as more central neural dysfunction were considered as possible aetiologies. With spinal or peri-spinal pathology these altered sensations very often presented in tissues anatomically displaced from the region of trauma. These were then considered to be examples of referred pain [2]. Studies into the specific anatomical areas of referral from different cervical joint complexes had led to the development of pain referral maps [3] that were made available to clinicians. These assisted in focusing both diagnostic technologies and subsequent treatment protocols. Similar mapping had not been achieved to date in equids. In the absence of referral mapping, abnormal responses to touch or pressure in the dorsal thoracic (under saddle) and cranio-ventral thoracic (girth) regions of the horse often led veterinarians to look for local trauma or the application of abnormal pressures through ill-fitting tac [4], overweight riders [6] or poor riding skills as being the major inciting factors. Cold backed syndrome had also been reported as a consequence of impingement of the dorsal spinous processes [7,8]. Here both pain present at the point of impingement and an element of referred pain in the epaxial musculature [9] were thought to be involved.

Diagnostic technologies such as MRI, CT and digital radiography had in more recent times led to a resurgence in research into the cervical and thoracolumbar spine [10-13] of horses. At the same time reference to referred pain being generated by pathology in specific joint complexes was rare and usually only reported when lameness was evident [14].

A large proportion of traumatic cervical injuries that occurred at speed in humans fell under the heading of whiplash-associated disorders (WAD) [15,16]. Symptoms included neck pain, headaches, numbness of head or face, dizziness, eye pain, vision loss, double vision, tinnitus, hearing loss, nausea, and numbness and/or weakness of the extremities [17]. In chronic cases areas of widespread pain and mechanical allodynia could persist [18,19]. However in horses, following both compressive and distractive cervical trauma that occurred commonly during steeplechase and cross country events, consideration was usually only given to any obvious superficial trauma or overt lameness that eventuated. In contrast a human WAD practitioner survey revealed that 30% of acute presentations were referred for diagnostic imaging. Of these 52.6% were for X-rays and 31.6% for CT scans [20].

Horses were usually only referred for scanning procedures if a fracture was suspected. Many cervical joint pathologies in horses had consequently been detected during research based scanning procedures, often at some significant time post trauma [11-14]. More recently the widespread availability of digital x-ray technology had seen cervical radiography utilised more routinely where neck or back pain was in evidence. Treatment for back pain in horses according to a 2016 survey revealed that 92% of clinicians elected to use corticosteroids, mostly injected in the locale of the altered sensitivity or pain [21], as their primary

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approach. In the same survey there had been an increasing number of veterinarians who employed alternative therapies 40% often in conjunction with corticosteroids. The intra-articular injection of corticsteriods was also being increasingly employed [22]. With human patients parental NSAIDS were commonly prescribed to manage the acute phase [20] followed in many cases by physical therapy and exercise protocols that aimed to restore and maintain range of movement in affected joint complexes [23].

Diagnosis

In the authors experience approximately 40% of horses that presented as cold backed were also girth shy. Altered behaviours included being sensitive to grooming, reacting to girth tightening or saddle placement, bucking, dropping when first mounted and then exhibiting a shortened gait until warmed up. A diagnosis was made by demonstrating an exaggerated withdrawal response to deep digital palpation of the local musculature 'mechanical allodynia' [21,24] in these regions. In a lessor proportion of cases there was a similar response to stroking of the skin in the affected areas. Measurable or quantitative responses to pressure could have been attained with the use of pressure algometry [25,26] however its use was not commonplace in general practice and it was not used in this study. If saddle fit issues were thought to be associated with muscle pain, the epaxial musculature which included the longissmus dorsi and multifidus muscles were often thought to be implicated [9]. Interestingly a significant proportion of the pressure exerted by a saddle on the horses back was evident more laterally [27] which then brought the latissimus dorsi into play. The major muscle groups impacted by girth pressure were again the latissimus dorsi laterally and the caudal deep pectoral (Pectorals Profundus) ventrally. Whilst much of the epaxial musculature was innervated locally these two muscle groups were innervated through the brachial plexus which was derived from lower cervical and upper thoracic nerve routes.

MATERIALS AND METHOD

Animal studies into the affects of transient cervical nerve root compression, similar to that recognised in cases of WAD, demonstrated the development of mechanical allodynia within associated muscle groups. Initially ipsilateral and then with increasing pressure contralateral mechanical allodynia was established [28]. A study into the influence of the sympathetic nervous system in WAD investigated 'both its ability to affect the contractibility of muscles and its ability to modulate the proprioceptive information arising from the muscle spindle receptors and, under certain conditions, to modulate nociceptive information' [29]. It was hypothesised that alterations to nerve elements present within muscles that were involved in proprioception such as golgi tendon organs may have been the mechanism through which mechanical allodynia developed [30].

Exaggerated responses to digital palpation of the latissimus dorsi and caudal deep pectoral muscles was a common finding with cases where horses presented as both girth shy and cold backed. These horses also exhibited a shortened forelimb stride when first ridden. Both of these muscles were described as adductors of the forelimb so logically any activation in response to pain would result in a shortening of stride . Objections to girth tightening, saddle placement and initial rider pressure when being mounted could have also been precipitated by abnormal responses in these muscle groups.

Records of horses that presented between 2003 and 2016 with demonstrable mechanical allodynia of both the latissimus doors and caudal deep pectorals were included in the study. 83 horses (2 stallions, 61 geldings and 20 mares). All horses subsequently underwent cervical vertebral mobilisation under anaesthetic (CVMUA) [31,32].

Treatment

A CVMUA was selected as the appropriate form of treatment as it permitted mobilisation of the lower cervical and upper thoracic joint complexes which were involved in forming the brachial plexus from which these muscle groups were innervated. This was followed by a controlled in hand and under saddle exercise program, to both maintain and further enhance any recovery of range of movement (ROM) achieved with CVMUA [32].

Human guidelines for the treatment of WAD included manual therapy, that being mobilisation but not manipulation of cervical joint complexes, in association with exercise programs that encouraged the maintenance and restoration of ROM [33].

RESULTS

83 horses presented as being both girth shy and cold backed and upon examination exhibited symptoms

of mechanical allodynia of both the caudal deep pectoral and latissimus dorsi muscles. They all underwent CVMUA followed by exercises both in hand and when ridden to help establish and then maintain cervical vertebral ROM. At reexamination between three and six months post treatment these symptoms were eliminated in 42 (1 stallion, 29 geldings, 12 mares) horses and significantly reduced in 23 (15 geldings, 8 mares) others. There was no significant change in the remaining 18 horses.

DISCUSSION

In the past the living vertebral column was a mostly unexplored area of a horses anatomy. This mostly due to the limitations of scanning technologies of the time. Nowadays the availability of multiple modalities including CT, MRI, digital radiography and ultrasonography has opened up this area to scrutiny not previously possible. Subsequently more recent studies had found many significant lesions present within the joints that provided input to the brachial plexus [12-14].

In human medicine where this technology had been available for some considerable period of time, researchers with the aide of clinical histories had been able to link certain anatomical areas that presented with hyperalgesia, mechanical allodynia and other neurologic alterations, to particular spinal joint complexes. These were then depicted in pain referral mapping [3]. This had not yet been accomplished in the equid and clinicians were thus more likely to investigate joint complexes in the immediate vicinity of the anatomy where altered sensations were evident.

There was also a tendency for horse persons including veterinarians to discuss neurologic change in terms of altered behaviour. As much as pain does alter an animals behaviour, investigations into the source of the pain should precede those into factors that might well exacerbate these conditions such as overweight riders and ill-fitting tac. One should always exclude the physical before declaring a condition to be of a behavioural or mechanical nature.

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