Lumbosacroiliac joint region pain in sports horses: a growing problem?

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The following data relate to a study of 296 horses with sacroiliac joint region pain (43 with primary sacroiliac joint region pain [Group 1] and 253 with concurrent hindlimb lameness [Group 2]) [1] and additional clinical observations. For inclusion horses had to demonstrate substantial improvement in clinical signs when ridden (or on the lunge if unsafe to ride) after infiltration of local anaesthetic solution around the sacroiliac joints.

A subcutaneous bleb of local anaesthetic solution was placed axial to the cranial margin of each tuber sacrale through which a 15 cm 18-gauge spinal needle was inserted and directed caudoventrally toward the caudal aspect of the contralateral sacroiliac joint. The precise angle was dictated by the space between the tubera sacrale which varied among horses, and the orientation of the spinous processes of the sixth lumbar vertebra and sacrum. The needle was advanced 12-15 cm before injection of mepivacaine (up to 10 mL per side [usual volume 8 mL for a 550 kg horse]). Horses were walked for 15 minutes and reassessed ridden or occasionally on the lunge if ridden exercise was not possible.

Clinical features

In Group 1, 14% of horses had a history of being difficult to shoe behind and 9% were reluctant to pick up a hindlimb and stand on the contralateral limb. There was increased tension in the longissimus dorsi muscles in 40% of horses and pain on palpation of the caudal thoracic and lumbar epaxial muscles of 12%. There was limited flexibility of the thoracolumbar region in 44% horses, with extension and lateral bending being principally affected; 19% became agitated when stimulated to flex and extend the thoracolumbar region. The thoracolumbar region was poorly muscled in 28%, especially in the lumbar region resulting in prominence of the summits of the lumbar spinous processes. The tubera sacrale were higher than the withers in 9%. During exercise 61% of horses demonstrated reduced range of motion of the thoracolumbosacral region. 21% of horses moved closely or plaited behind at walk and trot. In hand 29 % of horses moved with poor hindlimb impulsion compared to 31% of horses on the lunge and 54% of horses when ridden.

When ridden, 65% of horses had a poor-quality contact with the bit, tending to be above the bit. The quality of canter was worse than trot in the majority (81%). The canter was often stiff and stilted when ridden (27%); 16% of horses refused to go forwards and 16% would spontaneously come to an abrupt stop. 14% of horses bucked in trot; 27% bucked in canter and 22%) kicked out behind. One horse (3%) struggled with flying changes; 14% stiffened and lost rhythm during lateral work; 8% resented being ridden in sitting trot and 5% broke from trot to canter instead of increasing hindlimb engagement. There was a general reluctance to go forwards in 46% of horses, however 11% of horses were excessively strong and tense. Unilateral hindlimb lameness (range 1-4/8; median 2) was observed in 12% of horses, which was abolished by infiltration of mepivacaine around the ipsilateral sacroiliac joint.

A greater proportion of horses in Group 1 had an exaggerated response to vertical pressure applied to the tubera sacrale, demonstrated a bunny hop-like hindlimb gait in canter when ridden, or were not ridden because of potentially dangerous behaviour compared with horses in Group 2.

In Group 2 concurrent problems included: hindlimb lameness (38%), forelimb and hindlimb lameness (24%), thoracolumbar pain and forelimb and/ or hindlimb lameness (21%) thoracolumbar pain (11%), forelimb lameness (5%), and ataxia (0.4%). Significantly more horses had SI pain in association with hindlimb lameness compared with SI joint region pain in association with: thoracolumbar pain ($p<0.0001$), thoracolumbar pain and lameness ($p=0.0002$), forelimb lameness ($p<0.0001$), and forelimb and hindlimb lameness ($p=0.0006$).

Concurrent lameness was present in 89% of horses. Hindlimb lameness was observed in 80% of horses (90% bilateral; 10% unilateral). Proximal suspensory desmopathy was identified in 89% (94% bilateral; 6% unilateral) of horses with hindlimb lameness. Forelimb lameness was observed in 40% of all horses (49% bilateral; 51% unilateral). Pain localised to the digit contributed to forelimb lameness in 77% of horses with forelimb lameness.

Of 224 lame horses, 24% also had thoracolumbar region pain**.** A significantly greater proportion of horses had SI joint region pain, concurrent thoracolumbar pain and lameness compared with SI joint region pain and concurrent thoracolumbar pain ($p=0.002$). Significantly more horses had SI joint region pain and a concurrent hindlimb and forelimb lameness than SI joint region pain and concurrent thoracolumbar pain ($p=0.0002$).

In the majority of horses with concurrent pain contributing to lameness there was substantial improvement in the quality of the trot when ridden when the lameness was improved. Low-grade residual lameness was abolished by infiltration of mepivacaine around the sacroiliac joints. However, in some horses despite improvement in lameness, some aspects of the gait deteriorated especially in canter, presumably related to an alteration of the source and /or type of pain.

Diagnostic imaging

Skeletal scintigraphy was performed in 61% of horses. Abnormal radiopharmaceutical uptake (RU) in the region of the SI joints was present in only 47% of these horses. There was no significant difference in the proportion of horses having abnormal RU in Groups 1 and 2.

Ultrasonographic examination of the lumbosacral and sacroiliac joint regions was performed per rectum in 44% horses in which abnormalities were detected in 32%, including periarticular modelling of the sacroiliac joints, degenerative changes of the lumbosacral disc and sacralisation of the lumbosacral joint. There was no significant difference in presence of ultrasonographic abnormalities between Groups 1 and 2.

Discussion

Clinical signs may be more prevalent at the canter because of the three-beat asymmetrical gait resulting in one hindlimb weightbearing alone for a portion of the stride cycle [2]. This may increase pain compared with walk and trot, both symmetrical gaits. There is also maximal flexion/ extension motion in the lumbosacral region in canter compared with walk and trot [33] which may exacerbate pain. These clinical signs were dramatically improved by sacroiliac joint region block, supporting their association with sacroiliac joint region pain. In some horses the quality of canter was consistently worse on one rein (e.g., left rein) compared with the other (e.g., right rein) which may reflect asymmetrical pain. Horses were less likely to change their hindlimbs and become disunited in ridden canter compared with on the lunge, perhaps because the rider is able to balance the horse better and maintain the correct canter lead. Although not analysed in the current study, some horses with sacroiliac joint region pain intermittently, transiently scoot forwards at any gait, as if experiencing sharp pain. This behaviour is abolished by sacroiliac joint block.

In Group 1, unilateral hindlimb lameness was present in five ridden horses which subsequently resolved following sacroiliac joint block. Fourteen horses in Group 2 had residual lameness after distal limb nerve blocks which was eliminated by the sacroiliac block. This indicates that occasionally unilateral lameness may be associated with sacroiliac joint region pain alone and sacroiliac joint region diagnostic anaesthesia may be indicated in horses in which distal limb nerve blocks fail to resolve lameness.

Poor hindlimb impulsion, reduced range of motion of the thoracolumbosacral region ('back stiffness') and a tendency to be 'above the bit' were common non-specific features which were resolved by local anaesthesia of the sacroiliac joint region. Distinguishing primary thoracolumbar pain can be challenging because, as shown in this study, many horses with lumbosacroiliac joint region pain have atrophy of the epaxial muscles (usually symmetrical), especially in the lumbar region (longissimus dorsi and middle gluteal muscles), pain on palpation of the caudal thoracic and lumbar epaxial muscles ± fascia (symmetrical or asymmetrical, depending on the presence of factors such as left–right symmetry of sacroiliac joint region pain, lameness, saddle fit and rider crookedness/ straightness) and thoracolumbar-sacral stiffness. The latter is manifest particularly as limited induced extension and lateral bending at rest, especially in the caudal thoracic and lumbar regions, and reduced lumbosacral flexion during dynamic examination, especially when ridden. Moreover, pain associated with impinging spinous processes or osteoarthritis of the thoracolumbar articular process joints may coexist. In some horses with sacroiliac joint region pain the development of epaxial muscle atrophy has been recognised to occur quickly, over 2 weeks to a month. This rapid lumbar muscle atrophy may be the result of changes in muscle recruitment due to sacroiliac joint region pain, as is evident in humans [4].

Approximately 10% of horses had abnormal static conformation with the tubera sacrale higher than the withers, thus these horses were out of balance [5] and likely to have difficulties in engaging the hindlimbs. Whether such conformation predisposes to the development of sacroiliac joint region pain or develops secondary to pain deserves further investigation. It may be a postural change secondary to discomfort [6]. Approximately 9% of horses were reluctant to stand on one hindlimb with the other hindlimb flexed. We believe that this probably reflects rotation of the pelvis and asymmetric loading of the sacroiliac joints and supporting ligaments inducing joint torque, altered shear forces and pain. Asymmetric force distribution may also be the reason for lateral work exacerbating pain when ridden.

The majority of horses in the current study had lumbosacroiliac joint region pain and hindlimb lameness, a high proportion of which had hindlimb proximal suspensory desmopathy, as previously documented [7,8]. Although clear improvement in baseline lameness in hand was seen in some horses after perineural anaesthesia of the deep branch of the lateral plantar nerve, ridden exercise highlighted the presence of a significant component of residual pain, sometimes paradoxically worse after abolition of the baseline lameness. This emphasises the crucial importance of ridden exercise in both trot and canter when assessing lameness and poor performance. The biomechanical function of the sacroiliac joints in the horse is poorly understood; hindlimb lameness is presumed to alter loading of the joints but the mechanisms whereby this occurs are currently unknown [9].

The technique used to infiltrate local anaesthetic solution around the sacroiliac joints was well-tolerated, safe and effective, as previously demonstrated [7, 10]. Two horses experienced transient ataxia following sacroiliac block in addition to two other horse in the study period which were excluded because the block could not be interpreted and scintigraphy was negative or not performed. A post mortem study demonstrated that haemorrhage is not associated with needle placement periarticular to the sacroiliac joint [9]. Ultrasound-guided injection of the sacroiliac joint region has been described [11], however the cranial approach is effectively blind once the needle has passed under the ilial wing. However, it was shown to be reliable in a cadaver study [13]. The caudal approach risks damage to neurovascular structures [14,15] and sciatic nerve paralysis. The dramatic clinical improvements following sacroiliac block demonstrate the high level of discomfort experienced by many horses with sacroiliac joint region pain. The technique described is a periarticular technique and not specific for the sacroiliac joint; other local structures may be affected. Methylene blue injected in the sacroiliac joint region tracked forward to the lumbosacral joint [6]. Since many horses with chronic pain respond poorly to local medication of the sacroiliac joints [16], the response to local analgesia is of far more value diagnostically than assessing the response to treatment. However, occasionally there are false negative responses to a sacroiliac joint region block. During the study period one horse with clinical signs typical of sacroiliac joint region pain did not respond to local anaesthesia, but at post-mortem examination had extensive degenerative pathological abnormalities of the sacroiliac joints, in addition to asymmetry and slight malalignment of the lumbar articular process joints. Only 47% of horses which had a positive response to sacroiliac block and underwent scintigraphy had abnormal RU. Thus, scintigraphy alone is unreliable for the diagnosis of sacroiliac joint region pain.

During ridden exercise after infiltration of local anaesthetic solution it is important that the rider rides positively, starts in a two-point position, doing the easy movements first, before the more difficult movements, including canter. In some horses several minutes of ridden work are required before a horse is suddenly transformed in its performance.

Ultrasonographic examination of normal [17] and abnormal [18] sacroiliac joint regions has been described. In our study population the frequency of occurrence of abnormalities of the sacroiliac joints was small. However, abnormalities of the lumbosacral joint were identified that may contribute to pain [19].

Skeletal scintigraphy is an unreliable method of diagnosis of lumbosacroiliac joint region pain with a high proportion of both false negative and false positive results [1,15, 20].

In conclusion, clinical signs of lumbosacroiliac joint region pain are worse when horses are ridden and canter is generally more affected than trot. Bucking and kicking out in a trot-canter transition or during canter is a typical clinical sign. This may frequently be observed in showjumping horses between fences. Affected horses may be reluctant to 'get in deep' to a fence and lack power if taking off close to a fence. However, such horses may be able to compete at high levels if the take-off spots are appropriate. Suddenly 'scooting forwards' as if affected by an electric shock is likely to reflect neuropathic pain. Repeated violent head-tossing has been associated with lumbosacroiliac region pain [23].

Sacroiliac joint region diagnostic anaesthesia is a useful, safe but non-specific block [1, 10, 21, 22]. Ultrasonography and scintigraphy can provide additional information in some horses, but negative results do not preclude lumbosacroiliac joint region pain. A post-mortem study comparing horses with chronic lumbosacroiliac joint region pain and control horses has demonstrated that frequently there are many concurrent pathological changes involving not only the sacroiliac joint, but also the caudal lumbar and lumbosacral articulations, and the obturator, caudal gluteal and sciatic nerves [24].

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