

Therapeutic Modalities Employed to Restore Reduced Cervicospinal Range of Movement in Horses and Their Limitations

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Abstract: The importance of establishing and maintaining full or normal range of movement in articulated joints for both athletic endeavours and a general health viewpoint had been recognised for some time. Specific therapeutic modalities had been established with the aim of both restoring joint range of movement where reductions were recognised and maintaining range following in particular orthopaedic procedures. At the same time barriers to restoring range such as pain, patient anxiety and anatomic mass in larger species had been recognised. Horses with longer term, more severe reductions in range were also more difficult to mobilise. It was then important to select treatment modalities that were appropriate for these variations in presentation. Longer standing loss of range of movement with associated severe stiffness in lower cervical and upper thoracic vertebral joint complexes of equids, was a presentation which was best treated with cervical vertebral mobilisation under anaesthetic. Post treatment standing and ridden flexion exercises were advised to assist in maintaining newly acquired range.

Keywords: Horse, cervical spine, mobilisation, physiotherapy, ROM.

INTRODUCTION

The importance of spinal joint range of movement ROM in sports horse competition had been recognised by riders and trainers for centuries. Increasing importance was placed on this attribute with the inclusion of dressage in the olympic games of 1912. In human medicine the practice of both maintaining normal joint ROM and the application of both active and passive joint movements as a therapeutic modality were well established [1-3]. These concepts were beginning to receive similar attention in veterinary medicine however more through allied professions [4,5] which included chiropractors, physiotherapists, osteopaths and massage therapists. A 2016 survey intimated that 92 percent of veterinarians were administering intra-articular corticosteroids as a first line treatment for cervical joint issues. This suggested a poor appreciation for the need for adjunctive restoration of joint ROM [6]. This also intimated that the role of active and passive motion therapy in joint repair and maintenance was not being appreciated. Animal studies had demonstrated the benefits of these techniques in healing artificially created joint lesions [1]. Active (ridden) and passive (reward encouraged) motion therapies were being utilised but more often by owners or trainers.

Horses that presented with severe longer term loss of in particular lower cervical and upper thoracic ROM often showed limited shorter term improvements when treatments were applied in the conscious sedated or

unseated animal [5-8]. The anatomic mass, severity of stiffness and the horses lack of compliance were factors that could have potentially contributed to these poor outcomes. A mobilisation technique applied whilst the horse was anaesthetised, cervical vertebral mobilisation under anaesthetic CVMUA, had been successfully utilised since the early 1980's [9,10]. It had also been established that upper thoracic spinal joint complexes were being conjunctively mobilised during this process [11]. Once anaesthetised two clinicians would work in unison to more effectively deal with the anatomic mass and severe stiffness. Compressions and stretches could be maintained for long periods which aided in acquiring range.

MATERIALS AND METHOD

Twenty five thoroughbred racehorses (14 geldings and 11 fillies) from two to five years of age presented with severe stiffness (reduced ROM) of the lower cervical vertebral complexes and associated altered sensitivities. These including more distal conditions such as laminar corial hyperaesthesia [12]. Symptoms had been present for a minimum of six months. All horses had received multiple chiropractic treatments and were receiving regular flexion training under saddle prior to presentation. Assessments of range of movement were made manually by encouraging movement through available range with a feed reward and also under saddle by a single rider. 18 horses had bilateral reduced ROM of varying degrees whilst 5 had reduced range to the right only and two to the left.

The horses were then anaesthetised in an open grassed area to minimise stress and to reduce the

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likelihood of injuries. Whilst anaesthetised a more accurate assessment of reduced range could be made whilst tonus and pain perception were markedly reduced. The ability to move the horses muzzle towards the last rib on left and right flanks was the measurement used to assess lateral ROM.

The treatments consisted of a number of extension and compression movements that were under the control of the therapist [13]. An assistant was used to support the head during lateral mobilisation efforts [13]. The force necessary to initiate movement through the lost range and the length of time these forces were maintained increased with the severity of lost ROM. The principle of applying enough force to initiate movement and then maintaining this whilst the joint moved through range was applied. Pressure was released at the point movement ceased [9]. Following treatment the horses were confined to a stall and NSAIDS were administered for forty eight hours. The horses were then turned out in a quarter acre paddock for another 5 days. On day eight standing and ridden flexion training resumed. Reassessments of ROM were made at 6 and 14 weeks post treatment.

RESULTS

There was no evidence of lameness or injury following treatments. Whilst anaesthetised improvements in range of between 10cm and 40cm were achieved. The amount of force required to initiate movement was generally greater in longer standing cases. Improvements in ROM were not associated with any particular direction of loss of ROM. Lesser degrees of ROM acquisition were achieved with longer standing cases.

Standing reward based and ridden assessments were made by the same individuals as pre treatment. Reports invariably included behavioural changes including reductions in sensitivity (mechanical allodynia and hyperaesthesia). At six weeks 23 horses (14 geldings, 9 fillies) showed considerable improvement in ROM over presenting range. At fourteen weeks this degree of improved ROM was maintained in 8 horses (5 geldings, 3 fillies) and further improved in 15 horses.

DISCUSSION

Loss of ROM in equine cervicospinal joint complexes was invariably a consequence of a single or multiple traumatic incidents [14]. When these horses were further assessed using digital X-ray, CT or MRI

technology a range of joint pathologies including disc degeneration often became apparent [15-21].

There were a number of different therapeutic modalities employed to restore ROM in affected cervicospinal joints in horses [4,5,9]. Different interest groups often expounded upon the virtues of their techniques but reported less on their potential limitations.

As with any therapeutic modality there was a need to apply appropriate treatments to specific presentations. It had been suggested that treatments administered in the conscious horse could successfully restore reduced cervical and upper thoracic spinal ROM [5,8]. Some modalities [5] utilised sedation as a tool to achieve relaxation prior to treatment whilst other disciplines avoided their use [8]. In this study horses qualified for treatment on the basis that a combination of both ridden flexion training and repeated chiropractic manipulation and mobilisation had failed to achieve full ROM. In addition clinical evidence of reduced ROM had been established for periods of at least six months prior to presentation. Horses with contraindications to CVMUA [9] were excluded from this study.

The gross anatomy, severity of acquired stiffness or loss of ROM, tonus, pain perception and the innate strength of the adult equid were barriers to treatments that aimed to restore lost ROM in cervicospinal and upper thoracic joint complexes. Anaesthesia provided an environment where pain perception and the horses innate strength were removed from the equation whilst tonus was reduced. It was still often necessary to exert considerable force through several plains to initiate movement through lost range. This force was then maintained until movement in that plain ceased. A different position (head, neck) would then be adopted and mobilisation continued [9].

Following CVMUA flexion exercise programs in both the stationary and ridden horse were instituted to assist in maintaining improved range. Without these improved range to some extent could be lost as horses would habitually only use that range that they had become comfortable with.

In this study improved cervical ROM was evident in all horses following CVMUA. In addition ROM greater than that acquired at the time of treatment had been achieved with the addition of flexion exercise programs in 15 cases. A further benefit of CVMUA was that with the initiation of movement through lost range along with

accompanying improvements in behaviour and tractability, allied mobilisation techniques [5,8] were often more productive.

CVMUA then seemed a logical treatment choice in cases where lost ROM could not be restored in the standing conscious animal and in particular where this condition was severe and long standing.

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