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Thesis

By Josephine Jansen

Osteopathic Manual Therapy (OMT) in sport horse practice; How does Osteopathic Manual Therapy (OMT) support and improve sport horse performance?

Introduction

Osteopathic Manual Therapy (OMT) is a practice whereby manual manipulation techniques are applied to joints, in turn influencing a range of other musculoskeletal systems. Osteopathic Manual Therapy is based on four tenets or principles; one: the principle of body unity, two: the inter-relationship between structure and function, three: self regulatory and self- healing systems and four: the rule of artery is supreme. (Chila, 2011). Equine osteopathic treatment embodies a whole horse approach which is focused on treating the causation and not just symptoms aiming to enhance the restoration of balance, harmony and function within the horses body, also known as homeostasis. (Gadd, 2024). The equine body is considered a unit with the ability to heal itself only when it's in the correct structural condition, has favourable environmental conditions and adequate nutrition. In osteopathic medicine the body is viewed as a whole interconnected system; connections are significant particularly between structure and function and it is our job as equine professionals to identify treat faulty structure and function. (Still, 1917). Equine athletes alike human athletes are subject to and undergo intensive training programs in preparation for participation in competition at many differing levels, which similarly to human athletes is highly physically demanding and complete body homeostasis is desired to achieve the best performance possible for the individual whilst remaining structurally and within anatomically correct limits. Osteopathy as a concise medical practice for humans was founded in April, 1855 by Andrew Taylor Still (Hamonet, C 2003). OMT has since been applied to the equine species and has a significant supportive role in sport horse practice by increasing mobility, aiding recovery from injury plus reducing recovery times and thus, increasing performance. Another notable aspect regarding OMT in sport horse practice is integrative medicine, which is inclusive of science based therapies in conjunction with traditional western medicine (World

Government Summit, 2017) assisting in early intervention of career threatening traumas and rehabilitation of acute and often chronic traumas. The importance of paraprofessionals in the equine industry working together to achieve equine body homeostasis is of utmost importance and necessary for the equine athlete to initially succeed and furthermore for the continuation of their success. This thesis will further discuss in detail osteopathy's influence on equine locomotion, recovery and the importance of integrative therapy/medicine.

The role Osteopathic Articular Balancing (OAB) in supporting equine biomechanics and locomotion.

Equine locomotion refers to the movement of a horse which are categorised as 'gaits'. The equine athlete has four main distinctive gaits; walk, trot, canter and gallop. Each gait has a characteristic footfall sequence which differentiates them from one another and the gaits are symmetrical or asymmetrical dependant on type. (Pilliner, 2013). Whereas, equine biomechanics refers to the study of movement (locomotion) allowing trainers, vets and other equine professionals to objectively analyse locomotion in order to identify weak or problem areas which may be impacting an equine athletes performance by causing imbalance, inefficiency, reduced range of motion or even complete immobility. Osteopathic Articular Balancing (OAB) is an increasingly sought after practice in the performance or sport horse industry with its aim to restore body homeostasis to equine athletes who are under immense pressure and stresses may these stressed be internal or external. Osteopathic treatment is founded on the philosophy of treating the whole body and identifying the causation of imbalance not only the symptoms or obvious ailment. Osteopathic manipulations are directed at muscles facia and joints. Manual manipulation or mobilisation of joints can aid in altering

the signals transmitted to the central nervous system from these structures in the neural network, treatment can influence the processing of sensory information and motor response. Neurophysiological affects of equine osteopathy are significant to consider when treating particularly chronic ongoing issues in the equine performance horse. The book ‘Osteopathy and the treatment of horses’ written by Anthony Pusey, Julia Brooks and Annabel Jenks details and explores neurophysiological responses to injury stating that trauma such as a skin laceration (a wound or cut, many be superficial or deep) or a joint taken past its normal range of motion (often termed as a sprain), both of which are a prevalent and quite common injury in performance horses cause a response at the site of injury. Peripheral proprioceptors at the site of injury notify the central nervous system (CNS) that a painful sensation has occurred, and the information is sent to the brain to then initiate the appropriate responses to such trauma. An interesting note of this process is that the CNS may still register these signals long after the clinical symptoms have subsided, causing neurophysiological modifications to persist as though it is traumatic muscle memory. (Pusey, 2010). On a cellular level this neural activity is determined by a balance of inhibitory or excitatory signals. Only a a signal resulting from a strong stimulus can shift the neural activity in favour of healing mechanisms. With this in mind it is easy to understand how our equine partners remain in chronic pain patterns long after clinical injury symptoms have dissipated, this also elucidates the importance of osteopathic intervention. Dysfunction in the lower limbs may have significant affect on the axial skeleton as they attach directly onto it and osteopathy can be useful in the whole body recovery of structure and function through the body’s self healing mechanisms. A study conducted by I. Burgaud and . Biau in France with 26 horses analysed Osteopathic treatment of sport horses in relation to locomotion assessed the following gait related variables; propulsion, dorsoventral activity, lateral activity, propulsion time, symmetry and

regularity. Each group was comprised of 13 horses, with similar age ranges in each. Group A received osteopathic treatment whilst Group B was only groomed. These variable metrics were recorded with two accelerometers (Equimetrix) one placed at the croup and one on the sternum and recorded metrics for walking, trotting and galloping in a strait line under free conditions. The study concluded that osteopathic treatment improved all participants with young sport horse performance responding the best to a single osteopathic treatment with substantial improvement across these metrics (propulsion, dorsoventral activity, lateral activity, propulsion time, symmetry and regularity) immediately, improvements persisting for at least 20 days post treatment. Whereas the older horses in the group required a second treatment with a suggestion of incorporating an ongoing rehabilitation program. (I.Burguad & S.Biau, 2016). The use of sensors in this study for recording the differing gait variables give exact readings and allows for an unbiased data set to be recorded and analysed. The suggestion of the older group of horses requiring repeated treatment eludes that older horses may need more time to adapt possibly due to 'long-term potentiation and reverberating circuits' which is essentially traumatic muscle memory with the information of traumatic injury still circulating in the CNS long after clinical symptoms have subsided (Pusey, 2010). It is suggested in this study that older horses undergoing repeat osteopathic treatments should also be supported by the implementation of a rehabilitation program. Another study which demonstrates the effects of osteopathy on performance was conducted by Annica Nygren Thoresen, whereby osteopathic manipulations were carried out on horses suspected of hip, back and sacroiliac dysfunction. Three hundred and seventy four (374) horses were treated with osteopathic therapy in disciplines of which included; trotters, show jumpers, dressage horses, race horses, ponies, young horses and pleasure horses. Trotters typically displaying asymmetry worse in turns, pulling on one rein more than the other, head bent to one side and

slow in the last few hundred metres of racing. Show jumpers had difficulty jumping combinations, turning or refusing jumps. Dressage horses displayed crookedness, difficulty accepting the bit evenly, difficulty with lateral movement and canter transitions. (A. Thoresen, 2009). The results from the osteopathic treatments for this study are as follows; 222 (79%) of the 282 horses displayed restriction of one or both SIJ (sacroiliac joint) showed a positive result (no lameness or pain present & improved performance) after osteopathic treatment. Of the 374 horses 15 did not show a positive result after treatment. In the group that had restrictions in one or both hip joints and/or back and neck, without restriction in the SIJ, 76 (83%) had a positive result following osteopathic treatment, 16 had one treatment with unknown outcome.'. (A.Thoresen, 2009). These results put a number on improvement of biomechanics and locomotion for these horses post osteopathic treatment. These studies support how osteopathic manipulations assist the equine athlete in improving and supporting individual biomechanics and locomotion. By reducing pain, improving range of motion, supporting joint health and surrounding muscular health it allows the horse to move with improved balance, flexibility and power.

The role of osteopathy in performance horse recovery

In the equine performance horse sector physical activity often incurs metabolic demands above the threshold for the individuals personal conditioning. Poor performance is often exhibited as inability to adapt to the desired exercise demand, resulting from a defect or underperformance in one or more bodily systems that support physical activity in the performance horse. (M. Davis, 2010). Thee significant systems which support physical activity are; the respiratory, cardiovascular and musculoskeletal system (Gaelle, 2023). The

musculoskeletal system of which osteopathy is directly applied on and may influence other bodily systems. The musculoskeletal system is comprised of the horse's skeleton, muscles, fascia, ligaments, tendons, joints and some organs. The musculoskeletal system can be directly influenced by osteopathic manipulations, with the aim to improve or enhance mobility and function. (In motion equine, 2023). To break this down further the skeletal system provides a frame for the equine body and allows for the attachment of muscles and ligaments. The skeleton supports the weight of the animal and a good understanding of skeletal anatomy is imperative in order for an osteopath to perform accurate manipulations addressing restrictions and imbalances causing misalignment or asymmetry. The muscular systems role is to aid in posture, stability and movement. Comprehensive knowledge of muscle anatomy allows the practitioner to identify abnormalities in muscle tonicity, texture, temperature and tenderness and therefore identify areas of tension or weakness. Soft tissue manipulations or stretching may be applied to address these issues with the goal to improve alignment and symmetry. The nervous system plays a significant role in the musculoskeletal system as it communicates and coordinates signals from the body to brain, thereby regulating muscle tone, sensation and motor control. The circulatory system is responsible for the transport of oxygen, nutrients and waste products throughout the body. Improved circulation is achieved by increasing blood and lymphatic flow which supports and aids in tissue health and regeneration. (Gadd, 2024). Manipulation of the musculoskeletal system through osteopathic articular balancing therefore aids in the recovery of performance horses. The journal article 'Equine performance and equitation science: Clinical issues' which is published in the Elsevier journal of Applied Animal Behaviour Science states that equine performance can be influenced (inclusive of the quality of performance) by pain, whether or not that results in overt lameness. (Casey, 2017). It also discusses a significant

interrelationship between limb and thoracolumbar-sacral health and function. Horses experiencing lameness in the limbs respond by stiffening the thoracolumbar-sacral region causing secondary epaxial muscle pain which may lead to muscle wastage or atrophy. (Casey, 2017). Horses experiencing back pain often have their performance limited and ability to work impaired (Riccio, 2018). Preceding this remark, osteopathic treatment can be applied with therapeutic intent to manage and ideally improve these problem areas in the individual horse, resulting in the recovery of mobility, musculature, alignment and therefore improved performance. 'A Systematic Review of Musculoskeletal Mobilisation & Manupulation Techniques used in Veterinary Medicine' is a paper which reviewed the date from 149 publications of equine and some canine (although research in the canine sector is limited) osteopathic mobilisation and manipulation techniques, the paper analysed the results of each study. (Haussler, 2021). Although the study concludes that further investigative research is required in terms of osteopathic dosages, treatment times, interventions and follow-up; the study drew significant findings on decreased back pain following osteopathic treatment of the thoracolumbar reigon from 11% to 83% decrease in pain, eluding to a clinically significant improvement and anecdotally states that spinal manipulation appears more effective for treating chronic back pain and stiffness compared to acute pain cases. (Haussler, 2021). A significant finding to note is the overall efficacy figures; ranging from a 75-95% in clinical improvement and 90% return to work rate in horses at 6-12 weeks post treatment, decreasing to 53% at 6-months. (Haussler, 2021). This study suggests that manual osteopathic manipulation is effective in treatment in the recovery of musculoskeletal pain and stiffness, with a high rate of participants returning to work post treatment although the decreased rate in work at the 6-month mark suggests repeat treatment and management may be necessary to support the equine athletes continued performance. (Haussler, 2021). The role equine

osteopathy can play in the support of our equine athletes regarding recovery and rehabilitation is invaluable, its ability to heal, intervene with negative pain cycles and impact all bodily systems renders it a highly sort after tool in sport horse practice, seeking to improve overall horse welfare with each treatment.

The importance of integrative medicine/therapy.

"Integrative medicine is a combination of conventional and nonconventional health care." (Ross, 2001). Meaning integrative medicine is a combination of traditional veterinary practice and complementary therapies such as osteopathy, chiropractics and massage (manual therapies), as well as a number of non manual therapies inclusive of pulsed electromagnetic field therapy (PEMF) and laser therapy for example. Integrative medicine and therapy is necessary in sport horse practice as it allows for early intervention of traumas and injury, rehabilitation and ideally prevention. Emphasis placed on prevention as considering rates of musculoskeletal re-injury are quite prevalent and high in the performance horse industry. The article 'Frontier Medicine' from the journal 'Advances and the Future in Equine Medicine' discusses the significance of alternative therapy in conjunction with traditional veterinary medicine with each being distinct in their own practice yet complementary of each other. Traditional veterinary practice provides exemplary care of acute medical management plus surgical interventions where required and offers advanced diagnostic capabilities through technologies and tools such as digital radiography, MRI, ultrasound, CT scan in order to give accurate diagnostics and therefore diagnosis, although for some of these technologies the cost is high and not always affordable. Although, the article 'Frontier Medicine' states the benefit that complementary therapy has the potential to offer where a diagnosis is not clear and

traditional veterinary practice may have fewer recommendations. (Ross, 2001). Complementary therapy has provided opportunity to shift focus from not only diagnosing and treating injury to also preventative care, the integration of each playing a significant role of maintaining or improving longevity and managing chronic pain or ailments. (Ross, 2001). In regards to the implementation of complementary therapy alongside veterinary practice the article suggests that complementary therapy should be used to diagnose and treat subclinical manifestations of dysfunction such as low grade joint pain or restrictions in range of motion, therefore aiding in prevention of more significant injury and should be used primarily if it is considered effective and significantly safer than current medication or surgical options. The Elsevier published 'Equine Sports Medicine and Surgery - Third Edition' states that manual mobilisations and manipulations are geared towards providing pain relief, the restoration of normal joint biomechanics plus nerve function, improved muscle function and promotion of healing, these all being what the outcomes of osteopathic manipulation and balancing have to offer the equine performance horse industry. This manual discusses the importance of implementing effective rehabilitation plans tailored to the individual horse with consideration to what complementary resources are available and beneficial to assist recovery. (Equine Sports Medicine and Surgery, 2023). Another notable aspect is the importance of implementation of complementary therapy in the rehabilitation of horses post injury or surgery is integral to maximise recovery and future performance. (Ross, 2001). The book 'Osteopathy and the Treatment of Horses' includes a chapter labelled; 'The Therapeutic Team' which further discusses the beneficial relationship between vet and osteopath when treating horses stating "Two specialists looking at a problem from different angles ensure the best possible care of the animal." The text further explains vets can initially rule out underlying abnormal pathology with their expertise of rigorous specialist training combined

with access to advanced diagnostic equipment and osteopaths can provide diagnosis based on knowledge of biomechanics, neurophysiology and palpatory skills often providing solutions to biomechanical problems osteopaths commonly encounter which may be difficult for vets to treat with traditional medicine practices. (Pusey, 2010). Referring back to the study conducted by Annica Nygren Thoresen in 2009 which was discussed earlier in this text, whereby 374 horses exhibiting poor performance which had suspected sacroiliac, hip and back pain were treated with osteopathic techniques. Of the 374 horses the majority being 92% were examined for lameness by veterinarians and 78% had further intra-articular medical treatment without improvement. These cases were then referred to osteopaths, and of 374 horses 316 received osteopathic treatment with 298 which is 80% had a positive outcome post treatment meaning no lameness or gait asymmetry, improved race and performance times, decreased to no back pain or stiffness and horses returned to work competing at a higher level than prior to treatment. Of 316 horses treated with osteopathic techniques only 15 horses which is 4% did not improve post treatment. (Thoresen, 2009). This study elucidates the significance of integrative medicine, as not all conditions respond to traditional western medicine, although it is equally important to have a veterinarian rule out any underlying pathology. Therefore a team approach is required in the management of performance horses. Integrative medicine also allows for the prevention of injury. Farriers play a crucial role alongside vets and those who provide manual therapies to provide whole body homeostasis in the horse. Dr. Yogi Sharp is based in the UK and is a farrier that has produced extensive equine research on the affects of hoof distortion on equine health, alignment, muscular and joint health. His work explores the importance of a team approach to not only performance horse management but to all horses, “Often horses and their teams of professionals struggle with perpetuating cycles. Vets, and physiotherapists in particular

struggle with re-occurring, higher, musculoskeletal pathologies, caused by poor hoof conformation and yet often farriers are struggling with perpetuating negative hoof morphology no matter how much balancing they do at intervention because the hoof is responding to the forces from above." (Sharp, 2021). This statement shows the importance of integrative medicine, in that all parties need to work together to achieve homeostasis for our equine athletes and break negative cycles of upper musculoskeletal issues influencing negative hoof morphology and vice versa. Furthermore, the use of traditional equine medicine and veterinary practice in conjunction with alternative therapies such as osteopathy and farriery offers equine performance horses and those responsible for their primary care the support required for prevention of injury, superior rehabilitation from injury and potential increase in performance due to a collaborative and specialised approach for individual cases.

Conclusion

In conclusion, equine osteopathic treatment plays a significant role in supporting the equine athletes in fulfilling the demands in which we place on them, which are often significantly higher at the top levels of each sport. Having discussed the effects and positive influence osteopathy can have on the biomechanics and locomotion in rectifying imbalances, immobility and discomfort in the horse through not only the physical manipulation of the musculoskeletal system but also by the re-setting and regulation of the nervous system, it is clear that osteopathy can have a large and positive influence on equine performance. The role in which osteopathy plays in the recovery of performance horses should not be overlooked either, with studies showing horses returning to performance levels higher than prior to injury post osteopathic treatment and rehabilitation and its significance of ongoing support in

performance horses of age in order to maintain longevity in performance horses. The final aspect which was discussed in this text was the potential for performance horses which integrative medicine and therapies unlock, the significance of this topic underpins the philosophy of equine osteopathic treatment being that all systems need to work together to achieve bodily homeostasis, the same could be said for the equine professionals and paraprofessionals associated with performance horses. Professional collaboration is required when working with the equine athlete in order to achieve the best outcome for the horse; a good performance but more importantly a healthy, happy and sound horse.

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