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Effects of equine osteopathy on horses recovering from SI joint problems

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Introduction

Osteopathy was first developed by Andrew Taylor Still in the late 1800s. He was a doctor who believed that the function of the joints was very important to human health. This was far from the medical approach that was prevalent in the 1800s. He believed that fixing restrictions on the joints would help the whole body to heal from illnesses and pain. (Brooks, 2010.)

In osteopathy, the body is believed to have auto-regulation and self-recovery by a complex balance system. (Nygren Thoresen, 2009.) Osteopathy seeks to help the body find this balance again and that way heal itself. Osteopaths pursue to find dysfunctions in the body and take into account the whole body and all its interactions in diagnosing and treating. The problem in the balance of the body is called somatic dysfunction in osteopathy. Osteopathy treats local dysfunctions, but it also takes into consideration factors that endanger to problems in the future. (Nygren Thoresen, 2009.) This helps prevent lesions in the future, which doesn't happen if only the original lesion is treated. Also if only the original pain is being treated and not the dysfunction which lead to the lesion, this lesion has a great chance of coming back.

Horses are prey animals and if their ability to run is compromised they are endangered by predators. They usually compensate for pain somewhere by adjusting their movement so they can still function. As prey animals horses are trying to hide their pain. (Brooks, 2010.) This is the reason why the pain behaviour of horses is so hard to read, because as a prey animal horses aren't willing to show they are in pain. Compensatory patterns on the other hand might be misleading because they might make it harder to find the primary reason for the pain or other problems. It's not always easy to know which is a primary and which is a secondary lesion.

Compensatory patterns also create reflex effects on the body elsewhere and might be a source of new or future pain that might occur later. When rehabilitating a horse we should treat also these problems that compensations have caused and not only the reason, which is of course important too.

Anatomy of the sacroiliac joint

The equine back is divided into five different sections. The cervical vertebra has seven vertebrae, which travel from the nape of the horse's neck with an S curve to the thoracic vertebra behind the shoulder blade deep into the trunk of the horse. People usually think that the cervical vertebra goes on the upper part of the neck, but its S curve drops downwards after a curve in the nape of the neck. The thoracic vertebra has 18 vertebrae and 18 ribs. You can touch the thoracic vertebra from the back of the horse, but it's only spinous processes that you feel, not the vertebra body. Ribs are bony structures that you can feel on the sides of the horse if there isn't too much fat tissue on them. These can be used to find specific thoracic vertebrae on the horse's back.

After thoracic vertebra caudally comes lumbar vertebra with 6 vertebrae. The lumbar vertebra hasn't got as much movement between its joints as the cervical vertebra does, which is the most movable section of the back. The sacrum is the last part of the vertebra, before the tail. This part has five fused vertebrae. The tail is also called coccygeal vertebra and it consists of 15 to 21 vertebrae, normally 18. (Pilliner, Elmhurst, Davies, 2002.)

The pelvis is a structure at the hind end of the horse, which consists of three bones, which are fused. These bones are pubis, ilium and ischium. SI- joint is the joint between the sacrum and ilium. It's also called the sacroiliac joint, which is a synovial joint. Strong ligaments attach the ilium and sacrum and these are one part of the SIJ area that can be injured. (Pusey, Brooks, Jenks. 2010. Henson, 2018.) These structures are deep inside the horse's hind end so examining them is not easy. Some bony landmarks can be felt from the surface. These are tuber sacrale, tuber coxae and tuber ischii.

The sacroiliac joint has two flat bony surfaces that are in contact and form the synovial joint. Usually, synovial joints have two hyaline cartilage surfaces, but this joint has only one hyaline cartilage surface on the sacrum side. The iliac side has a fibrocartilaginous one. SIJ seems to be designed for gliding movement because of its structure. It doesn't seem to be a joint that could handle full weight bearing, but it transfers forces from the hindlimb to the trunk of the horse. (Henson, 2018.)

Strong ligaments in the SIJ area play an important role in this joint function. Two flat surfaces that meet in this joint need stability, which these ligaments provide. These ligaments make sure, that the SI joint is a very stable structure and it has only very little movement in it. As said earlier, it has some gliding movement, but it also seems to have some pivoting and impact-absorbing movements. These three sacroiliac ligaments are also called sacroiliac ligaments. In short SIL. These ligaments are the dorsal sacroiliac ligament (DSIL), ventral sacroiliac ligament (VSIL) and interosseus sacroiliac ligament (ISIL). (Henson, 2018.)

Sacroiliac joint lesions

Problems with the SIJ area may arise from trauma or overstressing the joint by too much exercising or the wrong kind of exercise. Falling, getting caught from the pelvis, twisting the hind end, slipping, hitting the pelvis, falling over backward by rearing or for example sliding stops of a reining horse. (Pusey, Brooks, Jenks. 2010. Friman, 2019.)

One problem in diagnosing SIJ lesions is, that the horse might not seem to be in pain after a trauma like falling in the paddock. Pain behavior might start later on when it's not so easy to put two things together and realize that it was the fall that caused this problem. This also makes it harder to find the problem from the SIJ. Horse owners should always follow the horse more closely after a fall and take into consideration SI joint lesions after that.

Usually, lesions in the SI joint are divided into osteoarthritis and ligament injuries. It seems that underuse with poor muscular control is more likely to cause osteoarthritis than overuse of the joint. Changes to the joint surface may occur after any abnormal forces affect the joint. With the SI joint, which is originally a very stable joint, problems occur when its mechanical loading changes from normal or functional instability occurs and the joint starts to move more than it's supposed to. (Friman, 2019.) For example, a ligament tear, because of a fall, prevents normal stabilizing of the SI joint area and this starts to stress the SI joint and in time osteoarthritis will form in the joint. Also, luxation of the SI joint is possible. Though it's rare.

Sacroiliac joint lesions may appear as hindlimb lameness (usually shortened stride of the hindlimb), uneven muscle development in the SI joint area, hunters bump (because of the atrophy of the

lumbar back), tuber sacrale are at different levels, when the hind limb is picked up the horse can't stand on the painful hindlimb, problems in the lope, bunny hopping, kicking or bucking at a lope or lope transitions, horse can be very heavy on the forehand, because of problems to engage the hind limbs, sensitivity to palpation of the soft tissue or tuber sacrale, poor performance, thoracolumbar pain and stiffness, stiffness in the back muscles, usually worse signs when ridden, dragging of the toe of the hind limb or both. Usually worse signs after a rest, (Henson, 2018. Ihasalo, 2020.)

A study of sacroiliac pain on equine done by Dyson and Murray suggests that symptoms that might suggest pain in SI the joint area are epaxial muscle loss and restricted flexibility in the thoracolumbar area, asymmetries in the hind end of the horse, pain response to palpation of the tuber sacrale area, reluctance to stand on one hindlimb, restricted hindlimb impulsion which was worse when ridden, stiffness, problems with the canter and staying on a bit. (Dyson, Murray, 2003.)

The problem with diagnosing SI joint lesions is that it has so many different pain symptoms which can also tell about pain in some other places. Lameness in a hind limb is usually seen as a problem in that hind limb and searching for the pain usually starts from there. If the reason isn't found in the leg that is lame, horses sometimes don't get the treatment they need and the owners or vet stop looking. This doesn't help the horse that is in pain.

Sacroiliac dysfunction

Nygren Thoresen claims that SID is usually caused by joint restriction with functional instability of the pelvis. (Nygren Thoresen, 2009) As earlier discussed SI joint is a very stable joint and has a lot of ligaments to support the structure and problems arise, if these structures aren't supporting enough.

Nygren Thoresen also points out that this instability in the SI joint may cause remodeling of the SI joint. (Nygren Thoresen, 2009.) Osteoarthritis may occur.

Horses in Nygren Thoresen's article had restrictions of the SI joint and that affected the stance and propulsion of the horse. This may be caused by spasms, weakness, and dysfunctions in the musculature. Horses with this restriction in the SI and hip joints had also restrictions in the thoracic and lumbar back. Precisely T16-L1. This might come from the connection between thoracolumbar fascia and muscles. (Nygren Thoresen, 2009). Understanding compensatory patterns and what you can usually find in a horse that is suffering from SI joint lesions, might help osteopaths to find out where the source of the pain is. And also realize which is the primary problem and which is secondary.

In this case, all the horses with restricted hip joints had also spasms and restrictions in mobility in the ipsilateral shoulder. The scapula and shoulder joint were affected. When the hip joint had been treated, these problems with the shoulder disappeared. This usually suggests the shoulder being the secondary problem and the hip joint being the primary one. (Nygren Thoresen, 2009).

In the study that Nygren Thoresen describes there were 10 horses with the symptoms of back pain and no lameness. 9 out of these 10 had injuries in the SI joint. This indicates that the majority of the horses with back pain have problems with the SI joint or hip. (Nygren Thoresen, 2009.) This study had quite a small sampling of the horses so more studies of the matter should be made.

In the end, Nygren Thoresen concludes that as the body functions as a whole, problems anywhere arise from new problems somewhere else. Problems in the pelvic and hip areas affect the shoulder

and torso, which leads to overloading of the distal limb. (Nygren Thoresen, 2009.) This is important to understand so compensatory patterns in rehabilitation aren't overlooked, but treated as well and also taken into consideration when trying to find the primary cause for the problems. So we could avoid treating only secondary issues and not finding the primary cause.

Rehabilitation of the sacroiliac joint

When rehabilitating a horse it is widely known that lesions at some point will lead to interrelated problems somewhere else. Limb dysfunction is a common finding when a horse has pain in the axial skeleton. Sometimes this leads to taking care of the wrong place and not finding the original reason for the symptoms. Stability and normal function of the whole vertebra will enable normal locomotion of the horse's whole body. (Henson, 2018.)

For successful rehabilitation, there are some important things to consider. The whole horse should be taken into consideration. Not just the lesion found. Because horses tend to compensate for pain somewhere by overusing some other place, this may cause problems later on, if rehabilitation trainers don't acknowledge this. Also, reflex points in the whole body should be treated and it should be of great importance to help the horse move in a way that the horse isn't overusing any part of himself, but moves in balance. It's also important, that the right, primary reason for pain is found and treated.

The horseback is a continuing structure. When rehabilitating some parts of it the other parts shouldn't be overlooked because there are always effects on the other parts of the vertebra too. So, when the SI joint area has lesions, rehabilitation shouldn't be pointed only to the lumbar back and

pelvis area, but to the whole spine to make sure that the whole spine is pain-free and gets back to its original function and stability. (Henson, 2018.)

The rehabilitation program should involve restoring the muscle's ordinary function and the re-training of the ordinary movement of the places affected. Mary Bromiley in the rehabilitation part of the equine neck and back pathology book says that Rehabilitation trainers should work together with osteopaths, chiropractors, acupuncturists, or masseurs because physiotherapy and rehabilitation work together bring out better outcomes for the horse. (Henson, 2018.) Osteopaths work to restore mobility in the joints and this way affects muscles moving the joint, they can help with the rehabilitation a lot.

Joyce Harman in the book Equine Neck and Back Pathology says that chiropractors and osteopaths are usually the ones who manipulate the spinal column. The goal of the manipulation is to restore normal function and nerve supply of the spinal cord. All the joints in the body should move in their whole range of movement without restrictions. Manipulation helps get rid of restrictions and allows the horse to move without pain and restrictions in his back and brings back flexibility to the whole horse. A tight back makes the horse move stiff so taking care of those restrictions makes the whole horse perform better. (Henson, 2018.)

According to literature, it is very evident that reflex effects are one very important part of rehabilitation. If the rehabilitation trainer only focuses is rehabilitating the cause, reflex effects will be painful to the horse, might affect the way the horse moves, and may bring new problems later on. To get the best results, the whole horse and how it moves, need to be taken into account.

Professionals rehabilitating and investigating the horse should also make sure that they have found

the real reason for the pain and symptoms of the horse and aren't trying to cure only a symptom of the original reason for the pain.

Equine osteopaths mobilize joints to help with the restrictions of the body. They aim to restore the normal range of movement in the joints and by mobilizing they affect soft tissues that move or stabilise the joint. This way they may help with the reflex effects that may cause restriction or pain in the body.

Equine back pain and manual therapies

A study made by Kevin K. Haussler and partners in 2021 named A Systematic Review of Musculoskeletal Mobilization and Manipulation Techniques Used in Veterinary Medicine states that using manual therapies with a veterinary practice in addressing neck, back and pelvis pain and dysfunction has become common practice in equine rehabilitation. The study also states that manipulation and mobilization techniques have a growing amount of evidence to favor their use in equine rehabilitation. (Haussler and Co. 2021.)

Manual therapy means treatment done by hand, like osteopathy. Because back pain can be difficult to treat it's positive that more studies show evidence to support their use in rehabilitation. Sometimes medical help isn't enough or doesn't help at all, so we should have a broader toolbox to help horses with back pain. We still need more studies on using osteopathy or other manual therapies in back pain or rehab, but there are already supportive studies to start using it as one piece of the rehabilitation.

This same study made of manual therapy use in the treatment of musculoskeletal problems, showed that most owners reported positive outcomes on horses treated with mobilization techniques or osteopathy. One study about equine osteopathy showed that in 6-12 weeks after osteopathic treatment, 90% of the horses returned to work. These horses had earlier had conventional treatment,

which hadn't worked. After more than 12 months 53% of the horses continued normal work, 31% had dropped their level lower and 16% were unrideable. (Haussler and Co. 2021.)

Most of the horses had benefited from the osteopathic treatment. All of them didn't. Even just back pain in horses can have so many different starting points in horses and may need so different kind of approach that more studies should be made. Maybe with the help of a veterinarian. A clear diagnosis from a veterinarian could help. Usually, SI joint lesions seem to need both veterinary and osteopathic help in rehabilitation. Some might benefit greatly already from one of them.

Equine back and osteopathy

In a study made about equine back pain by B. Riccio, C. Frascetto, J. Villanueva, F. Cantatore, and A. Bertuglia they state that good complementary therapies in treating back pain according to the responders to their survey are osteopathic manipulations, kinesiotherapy, and acupuncture. (Riccio and co. 2018.) In this study, osteopathy was mostly used and was found the most effective one of the complementary therapies. (Figure1) The study also shows that the use of complementary therapies in treating back pain increased between 2006 and 2016. Which might also suggest that their effects had been noticed.

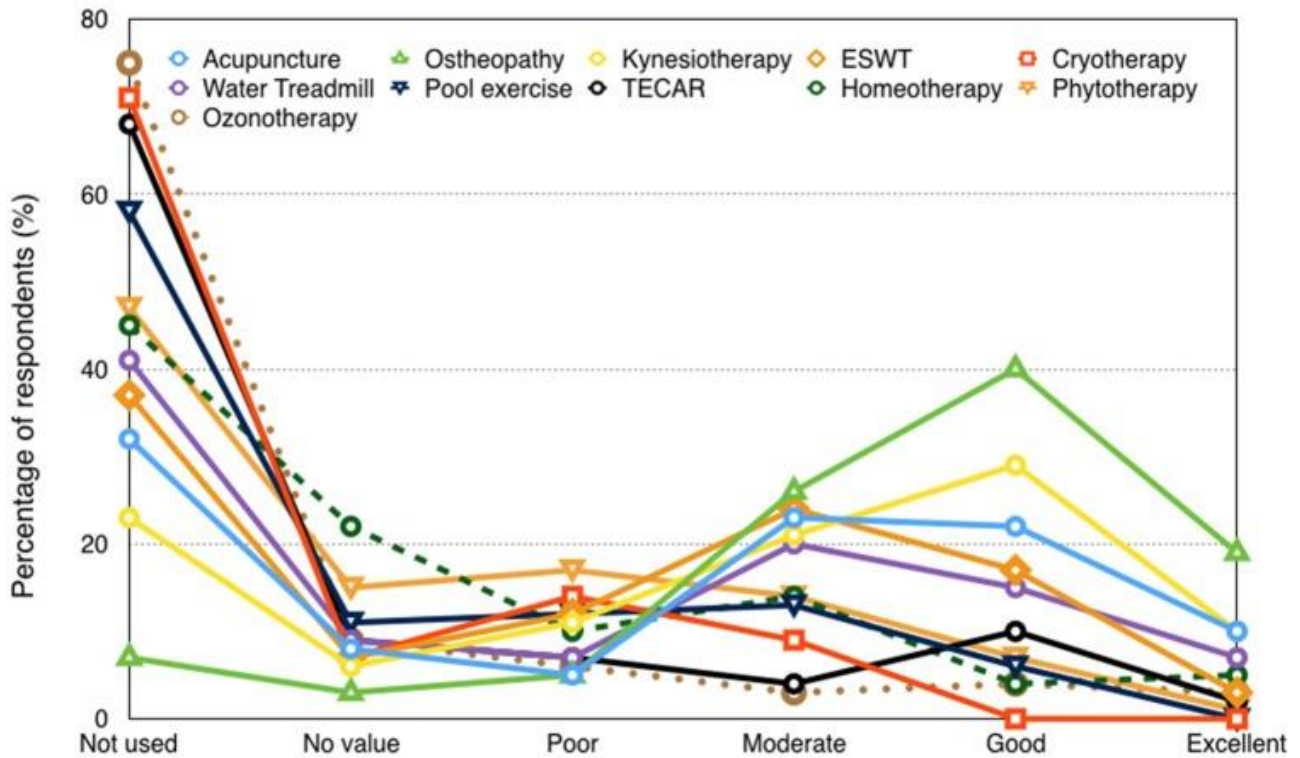


Figure 1. Source: Open access article PubMed: Two Multicenter Surveys on Equine Back-Pain 10 Years a Part. Barbara Riccio, Claudia Frascetto, Justine Villanueva, Federica Cantatore, Andrea Bertuglia.

The same study shows that diagnosis of equine back pain is considered challenging. This is because pain behaviour can have so many variations and structures to investigate are hard to access. Medical treatment for SI joint areas has usually been corticosteroid injections. Nowadays injections are usually given with ultrasonographic guidance. (Riccio and co. 2018)

SI joint area is difficult to diagnose because it's deep into the horse's hind end. Sacroiliac joints aren't seen on the surface with the ultrasound and can't be x-rayed, because of the pelvis on the way. Usually, vets use rectal ultrasound to diagnose SI joint lesions in Finland.

A study on Equine back pain by Barbara Riccio, Claudia Frascetto, Justine Villanueva, Federica Cantatore, and Andrea Bertuglia tells us that equine osteopathy has been seen as an effective treatment method for back pain in horses. Equine osteopathy with other complementary methods had also gained more popularity in ten years between these two studies, which might also suggest that it has been effective. Studies showed that osteopathic treatment had brought results. As you can see in Figure 1 there was only a small percentage that had not seen any results and most had had moderate, good, or excellent results. This suggests that equine osteopathy would be a great asset to the rehabilitation program of SI joint lesions on horses.

Effects of Osteopathic Manipulations

Annica Nygren Thoresen is a DVM, IVAS-certified acupuncturist, and ISEO-certified equine osteopath, who made a case report in Effects of osteopathic manipulations on performance in 374 horses with suspected sacroiliac and/or hip dysfunction and back pain: 2006-2007. In this study, horses were treated only with osteopathy. The horses had been performing poorly and most of them had been done lameness exam (92%). 78% of the horses had also had intra-articular medical treatment which didn't help. 87% of the horses had restriction of mobility in one or both hip joints. 75% of the horses had restrictions in one or both sacroiliac joints which was seen secondary issue to the hip joint restriction. (Nygren Thoresen, 2009.)

All studied horses had very similar osteopathic lesions regardless of discipline. 316 of these horses had 3 or more treatments and 80% of these had positive results afterward. After osteopathic treatments, these horses showed no lameness or gait asymmetries and no back pain or stiffness in the back. Trotting and racing horses improved their race time, earnings, and results. Riding horses

had leveled up in training and competitions. There was also 4% of the horses that didn't have positive results of the treatment. (Nygren Thoresen, 2009.)

Nygren Thoresen points also out that diagnosing dysfunction of the SI joint is not easy, because of its position, which makes it hard to examine by the veterinarian. When the area is examined with ultrasonography the findings must be estimated with the other findings. The horse should be also examined by physical and lameness exams, sacroiliac stress tests, periarticular SIJ analgesia, and maybe even nuclear scintigraphy. The veterinarian needs to rule out any other causes for the horse's pain behavior before they can diagnose SI joint lesions. (Nygren Thoresen, 2009.) Also, pain behavior that is typical for the SIJ lesions helps to indicate if it's an SI joint problem or not. The vet needs to take into consideration all of these to get an overall picture to make the diagnosis. Only ultrasonography or another exam isn't enough.

Nygren Thoresen claims that the hip joint isn't usually the source of pain, but it's more of a muscle issue. This with the fact that it's not easy to reach by veterinary methods makes osteopathy a better way for diagnosing and treating this area according to Nygren Thoresen. (Nygren Thoresen, 2009.) In Finland veterinarians are the only ones who are allowed to do diagnoses, so diagnosing a vet would be the choice first even though osteopathy could be a great asset in the treatment of the SI joint area. Osteopaths could also help figure out where the problem originates from. It might be very beneficial to have the vet check the horse before osteopathy or at least after if the osteopath finds some major restrictions or other pain indicators from the horse.

Symptoms such as stiffness, poor performance, and gait asymmetry without pathological reason to be found tell us about somatic dysfunction which is part of osteopathic fundamentals. Equine

osteopathy is developed to help with these somatic dysfunctions by biomechanical techniques like manipulation and mobilization. There are also techniques for testing and finding the problem areas to be treated. Problems with the range of motion in the SI joint, hip, or back of the horse may overload soft tissues of the front and hind end. (Nygren Thoresen, 2009.)

In osteopathy, you can test and treat all the joints in the body with your hands. The osteopath needs to make a thorough examination of the horse by palpation and testing of the joints to discover lesions. (Nygren Thoresen, 2009.) Assessing a horse's movements might also help when trying to figure out, where the problem's origin is. When suspecting SI joint problems, it might be beneficial to see the horse in a lope too, because as we have learned earlier, SI joint problems might be more evident in a lope. SI joint problems might also be worse when ridden, so that may also reveal some pain behavior or movement patterns that will help figure out where to focus treatment or investigate more.

It's not always easy to know which of the problems found in horses' bodies are primary and which are reflex effects of the primary reason. In horses, the muscles of the hip joint seem to be very important to the whole body. The goal of osteopathic treatment is to normalize the areas of somatic dysfunctions. This means returning a normal range of motion in joints in all directions, removing pain and inhibition, returning normal sensitivity, facilitation, and improving tissue function. (Nygren Thoresen, 2009.)

Conclusions

The studies introduced in this thesis show that manual therapies, like osteopathy, are used more and more in rehabilitating SI joint area lesions on horses. They have been found a valuable tool with the

veterinary help that these problems sometimes need. When people are using something more and more it usually means that it has been seen as a tool to bring positive outcomes.

It seems that osteopathy might be a valuable tool in rehabilitating horses with sacroiliac joint lesions. This is a place that isn't easy to diagnose or treat by veterinary medicine. Usually, just veterinary help isn't enough, but the horse needs help with complementary treatment methods and the right kind of exercises. Too much rest is not advisable, because the SI joint area needs strong muscles and ligaments to support the structure.

One of the most important things in SI joint area lesion rehabilitation is the right kind of movement. Osteopathy can also help in this because it helps with the restrictions of the joints. After treatment, the horse can start to move more normally. After that, it's easier for the rehabilitation trainer to get to reinforce the right movement, muscles and other soft tissues that are needed for it.

Equine osteopaths can help with SI joint lesions because therapists don't have to be able to touch the spot, but they can use mobilization and manipulation techniques to reach the area and all the soft tissues around it. By mobilization and manipulation, osteopaths can help to release restrictions in joints, which will also help relieve pain. Osteopathy can help find the reason for problems because restrictions in the range of movement in the joints can be felt with the techniques used to find and treat horses.

There are also compensatory patterns that need to be taken into account so they won't cause problems later on. When these reflex effects which the original reason has caused are treated early

on by osteopathy the horse can become pain-free and healthy. Osteopathy considers the whole body and doesn't just treat the original cause which is of course also important to treat and find. Osteopathy can this way help with the whole horse in the same treatment by treating both the primary and the secondary issues in one treatment. Of course, follow-up treatments are usually necessary too.

References

- (1) Henson, F.M.D. (2018). Equine Neck and Back Pathology: Diagnosis and Treatment. 30-31, 239-241, 268, 273, 283-285.
- (2) Pilliner, S. Elmhurst, S. Davies, Z. (2002) The Horse in Motion. 65-71.
- (3) Ihasalo, S. (2020) Hevosen käytännön anatomia. 83.
- (4) Pusey, A. Brooks, J. Jenks, A. (2010). Osteopathy and the treatment of Horses. 40, 43, 144.
- (5) Friman, M. (2019). Hevosen SI-nivelen anatomia, tyypillisimmät alueen ongelmat ja niiden hoito. 8. <https://helda.helsinki.fi/server/api/core/bitstreams/d94dacab-dd25-4674-9086-08c95b7921f5/content>
- (6) Dyson, S. Murray, R. (2003). Pain associated with the sacroiliac joint region: a clinical study of 74 horses. <https://pubmed.ncbi.nlm.nih.gov/12755425/>
- (7) Riccio, B. Fraschetto, C. Villanueva, J. Cantatore, F. Bertuglia, A. (2018). Two Multicenter Surveys on Equine Back-Pain 10 Years a Part. <https://www.ncbi.nlm.nih.gov/pmc/articles/PMC6115529/>
- (8) Nygren Thoresen, A. (2009). Effect of osteopathic manipulations on performance in 374 horses with suspected sacroiliac and/or hip joint dysfunction and back pain: 2006 –2007

https://www.researchgate.net/publication/201798894_Case_Reports_Effect_of_osteopathic_manipulations_on_performance_in_374_horses_with_suspected_sacroiliac_andor_hip_joint_dysfunction_and_back_pain_2006_-2007

- (9) Haussler, K. Hesbach, A.L. Romano, L. Goff, L. and Bergh, A. (2021). A Systematic Review of Musculoskeletal Mobilization and Manipulation Techniques Used in Veterinary Medicine.

<https://www.mdpi.com/2076-2615/11/10/2787>