If Only They Could Talk

Our regular focus on equine health. This month MJR vet NIeL MeCHiE considers the use of boots and bandages and dispels some common myths about their advantages.

BOOTS and bandages are commonly used to provide some form of protection for the lower legs during exercise or turnout. Orthopaedic problems are one of the most common reasons for a vet being called to examine or treat a horse. But can boots and bandages do more harm than good?

Below the knee in a front limb or the hock in a hind limb there is little soft tissue to cushion any impact on the lower leg, for example from hitting a jump, or from an interference “knock” from another leg (brushing, over-reaching). These contacts can damage the skin, bone, joints and tendons.

Other factors which can increase the risk of interference-type (knocking) injuries include conformation, degree of fitness, rider experience and skill, quality of shoeing, uneven surfaces, heavy boots or a horse becoming tired.

Repetitive

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Sometimes there will not be any immediate obvious trauma – perhaps a cut, or slight filling may be present. But several hours later as a result of an inflammatory response the area struck may be swollen and sore. If a horse’s legs are knocked repeatedly, especially over the sesamoids, joints or tendons, the concussive damage could be sufficient to cause inflammation, which in turn could lead to tissue damage.

This is where we enter in to the use of bandages or boots on the lower legs. From what we have already highlighted, a bandage or boot should protect not only against damage that could be caused by penetration or cutting (e.g. of a shoe or sharp stone) or of abrasion (e.g. when hitting a jump) but also against concussive damage; damage that does not necessarily leave any immediate or visible sign on the leg. So, protective bandages or boots really support joints and tendons?

Many people apply bandages or boots to horses’ legs too tightly. This may be for fear that they will come undone or move, in which case they are likely either of poor design or a poor fit. However, people often say that they put them on tight to give support to the limb structures such as the tendons or the joints. Yet there is minimal information to suggest that bandages or boots for exercise provide support for soft tissues or joints.

If bandages or boots are applied too tightly or are constructed of inflexible (i.e. stiff) material, they have the potential to restrict joint movement. This can lead to abnormal loading or patterns of movement with an increased risk of injury. There are relatively few scientific studies in this area but the ones that exist show appreciable restriction of natural range of movement in legs that have bandages or boots on.

Four different types of bandage or boot were tested in a scientific study and all four reduced fetlock joint extension at trot. In another study range of movement in the fetlock joint was reduced to six degrees.

Tight bandages or boots can also result in discomfort and rubbing injuries, which may cause direct damage to skin or tendons but in turn will also alter a horse’s gait. Materials such as stones, twigs, gallop surface, mud, etc can become trapped between boots and the skin, leading to abrasion and infection.

Any weight added on to a horse will require an increased effort on the part of the horse to move that weight. This is of course true of a rider and tack. However, kilo for kilo, weight placed on the end of the limbs will have a greater impact than weight carried in the saddle area.

AccelErate

The reason for this is that the limbs are moving faster than the main body. The need to be able to accelerate the limbs quickly explains why they are so light when compared with the rest of the body. This is also why there is not much on the lower legs other than bone, some tendons and a small amount of muscle. All unnecessary weight has been “removed”.

Any weight added requires more energy to be put in to get the leg moving and more energy to stop it and make it swing back again. Hence, exercise steel shoes weigh around 200g, and we put even lighter aluminium shoes of 80g on a horse to race.

Thus, adding small amounts of weight to the end of the leg in the form of a boot increases the effort the horse must put in to run. In addition, not only can weight increase the energy needed for exercise it can also alter the way the horse actually moves its legs, its gait.

We should also take into account the potential for boots or bandages to absorb water when in use. Bandages or boots that weigh only around 100-200g each when dry may well be able to hold 100-200ml of water and as 1ml of water weighs 1g, this could double the weight of the bandages or boots if the horse was exercising in wet conditions or going through water.

Another 10 minutes then around 80% died. These results were confirmed by a more recent study of equine tendon cells in Japan. This study also showed that the higher the temperature, the more tendon cells that died and furthermore, showed that inflammatory mediators were released after heating.

Inflammatory mediators are chemicals and hormones within the body that cause inflammation (heat, swelling, pain) and tissue damage. If these mediators are released after heating, the inflammatory response can be exacerbated.

ie The tendon temperatures are very high not only because of heat production within the tendons but because the surface temperature could reach 45°C. These high temperatures can also affect the tendon cells. As the tendon cells are sensitive to heating, the risk of these cells being damaged increases.

As the tendon cells die, the inflammatory response could be exacerbated, leading to a further increase in temperature and inflammation. This could lead to the release of further inflammatory mediators, which could further increase the risk of tendon damage.

The next issue with boot and bandage use during exercise relates to heating. Tendons are elastic structures and as they are repeatedly loaded/stretched they can also become heated. This is particularly important when boots are used on horses galloping without boots on could reach 45°C, second only in the body to muscle temperatures.

Inflammatory mediators are released after heating and can cause inflammation, pain and tissue damage. In the case of tendons, this can lead to interference-type injuries, which can cause skin, bone, joint and tendon damage.

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