Differences between Dog and Horse Fascia: A Histological Investigation

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Background

Whilst fascia research continues to interest the field of Veterinary medicine there still remains a dearth of information about differences in both the macro and micro anatomical structures of fascia in diverse species of animals. The aim of this study, therefore, is to compare the fascia of the horse and the dog in three specific regions at the microscopic level.

Methods

Three dogs and three horses of different ages and breeds were euthanized for unrelated reasons. The animals were dissected and tissue for histology was sampled from three regions considered as key areas in relation to the recently discovered and published dissected myofascial kinetic lines [1]: 1) caudo-ventral to the atlas wing, 2) cranio-ventral side of the tuber coxae, and 3) cranio-lateral to the tuber sacrale. Samples were immediately fixed in a neutral-buffered formalin solution, and subsequently embedded in paraffin before being sectioned and stained using Hematoxylin-Eosin, Alcian Blue, Van Gieson and Resorcein Fuchsin solutions. Light microscopy was performed on the sections.

Results

In both horses and dogs, the composition of the layers followed the general histological model. In dogs though larger amounts of adipose tissues were present right under the dermis whereas in horse the superficial fascia seemed to be closely attached to the dermis. In dog the alcian-blue staining, which indicated the presence of hyaluronic acid, was stronger in both the superficial and deep fascia as compared to horses where it was mainly present in deep fascia. Only few elastic fibers were present in superficial layers of fascia in both horses and dogs.

Conclusion

It is concluded that both the dog and equine fascia have similarities but also reveal some differences in the histology. These differences might reflect the biomechanics of the two species. The horses need stability and have shock absorbing constructions in the limbs whereas parts of the shock absorption in the dogs take place in the skin and underlying structures. Weather these differences have effect on the functional anatomy and myofascial release and treatment of animals remains to be established.

References

Overview pictures of histological samples of horse (fig. 1) and dog (fig. 2) in the upper neck region. H.E stain. Magnification bar 1mm.