

Bovine Papillomavirus in equine sarcoids and other skin conditions of horses – an overview.

Sarcoids are a common and potentially debilitating skin lesion in horses. Equine sarcoids are currently believed to be caused by infection with a virus, bovine papillomavirus (BPV). However, recent reports have suggested that BPV may also be present on the normal skin and in other, non-sarcoid skin lesions of horses. This observation has significant importance for our understanding of the cause of, and our ability to design non-invasive tests for, equine sarcoids. There have been numerous attempts to develop a non-invasive diagnostic test for sarcoids based on recovering BPV from skin lesions of horses. If inflammatory skin lesions of horses and the normal skin of horses also contain BPV DNA then testing methods based on the presence of BPV DNA as a marker for equine sarcoid may not be valid. In addition, if BPV is present in the same locations in non-sarcoid horse skin as in sarcoids perhaps BPV isn't the cause of sarcoids at all.

Our study examined skin biopsies from a large group of different skin conditions of horses, including normal horse skin. We were able to recover BPV from some samples of all of the different skin conditions. Although we found virus in a lower number of these cases than in equine sarcoids, it was still present in nearly 50% of cases we looked at. If it is so common, we needed to determine if where the virus was on or in the skin was different between sarcoids and non-sarcoids. For example, it maybe that in sarcoids virus is present deep beneath the skin surface causing the tumor to grow. While in non-sarcoids skin diseases, the virus is just sitting on the skin surface contaminating it, but unable to penetrate the skin where it could cause disease.

To test this we used a specially equipped microscope and laser to cut the skin biopsies from both sarcoids and non sarcoid skin cases into different tissue compartments to see where the virus is located. What we found was that in sarcoids most of the virus was deep within the skin, while in non sarcoid cases it was more likely to be found on the skin surface. In addition, when the virus was present deep beneath the skin in non-sarcoid lesions it was usually associated with inflamed areas of the skin. This suggests that in most of the non-sarcoid skin lesions BPV is a surface contaminant, but if the skin becomes inflamed the virus can penetrate the skin deeply and this could be how sarcoids develop.

These results help us to better understand how sarcoids develop. In addition, they suggest that non-invasive tests for virus (like skin swabs etc.) are not likely to be helpful because the virus can commonly be found as a contaminant of normal horse skin. Better understanding of equine sarcoids and their development can hopefully allow us to develop effective tests and treatments for this condition.

In 2009, the EQUINE FOUNDATION OF CANADA GAVE A GRANT OF \$10,000 TO The Western College of Veterinary Medicine, University of Saskatchewan, at Saskatoon, SK, for research on Equine Sarcoids. WCVM matched the amount, for a total of \$20,000, for the research. The following is from Bruce Wobeser of WCVM.

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