Ocular Findings in Quarter Horses With Hereditary Equine Regional Dermal Asthenia

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The genetic mutation responsible for hereditary equine regional dermal asthenia (HERDA) affects ocular tissues and the skin. Authors’ addresses: Department of Clinical Sciences (Mochal, Miller, Linford, Rashmir-Raven) and Department of Pathobiology and Population Medicine (Cooley, Ryan), College of Veterinary Medicine, Mississippi State University, PO Box 6100, Mississippi State, Mississippi 39762; e-mail: mochal@cvm.msstate.edu (Mochal). © 2009 AAEP.

1. Introduction

Hereditary equine regional dermal asthenia (HERDA) is caused by a missense mutation in the equine cyclophilin B gene, which may also affect tissues other than the horse’s skin. Ocular structures of Quarter Horses homozygous (Hr/Hr) for HERDA were therefore compared with those of non-HERDA (N/N) Quarter Horses.

2. Materials and Methods

This was a prospective study that evaluated the ocular structures in 10 HERDA and 10 non-HERDA horses. Ophthalmic examination, Schirmer tear tests, tonometry, cornea pachymetry, histopathology and scanning electron microscopy were performed on these animals. A retrospective study was also conducted on 28 HERDA horses and 291 non-HERDA horses. Records were reviewed to compare the incidence of corneal ulceration in HERDA and non-HERDA horses over a 4-yr period.

3. Results

Corneal thickness for HERDA horses (median, 720 μm) was significantly less than that of controls (median, 800 μm; p = 0.0073), but tear production was significantly greater in HERDA than non-HERDA horses. Scanning electron microscopy showed zones of disorganized, haphazardly arranged collagen fibrils in the corneas of HERDA horses that were not present in the corneas of controls. The incidence of corneal ulceration was significantly greater for the HERDA than for non-HERDA horses during the study (4.8 versus 0.13 corneal ulcers per 1000 horse-months, p < 0.005).

4. Discussion

Alterations in corneal thickness, collagen fiber arrangements, and incidence of corneal ulceration indicate that abnormalities in HERDA horses are not limited to the skin. This is the first report of HERDA lesions in tissues other than the skin.