Normative Electroretinographic Data for Equine Patients

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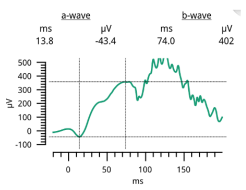
Introduction

- Electroretinography is a diagnostic tool that measures the electrical activity of the outer retina in response to light stimulus, thus assessing its function.
- Standard flash electroretinography measures the health of the outer retina, including rods, cones, and bipolar cells.
- The LKC RETevet is a new, portable electroretinographic device used to diagnose retinal dysfunction in many different species, including horses.
- The purpose of this study was to establish reference values in normal horses using the LKC RETevet.

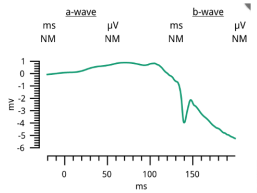
Methods

- The ERGs from 45 horses at the Center for Equine Health participating in the Pioneer Horse Health Project and 3 client-owned horses were collected.
- Automated values were generated with the LKC RETevet software.
- A- and b-wave amplitudes and implicit times were manually extracted for the 48 horses.

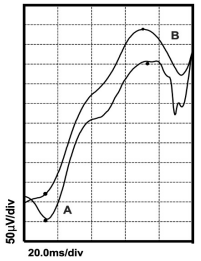
Horse 2 OS Automated



Horse 1 OS Automated



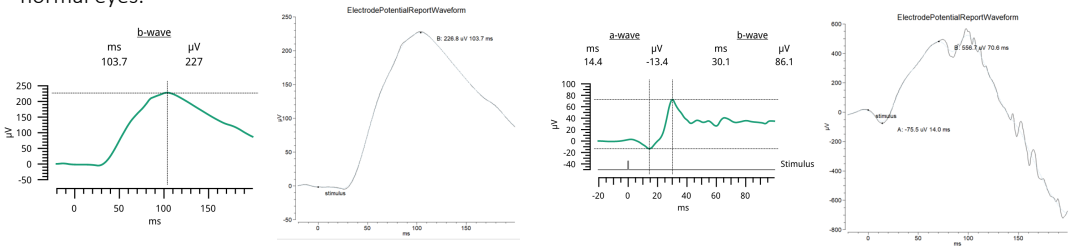
Horse 1 and 2 OS Manual



- Mean ± SD of horses tested was 13 ± 4 years (29 mares and 19 geldings).
- 16 Thoroughbreds, 12 Standardbreds, 12 Quarter Horses, 2 American Paints, 2 Lipizzans, 1 Belgian Warmblood, and 1 Lucitano.

Results

Reference data was established for the LKC RETevet electroretinogram device from 48 horses with normal eyes.



Scotopic 1: Flash 0.010 cd s/m² at 0.5 Hz

Variable	AUTOMATED (n = 36) Mean ± SD (Range)	MANUAL (n=48) Mean ± SD (Range)
B-wave Implicit Time (ms)	94.6 ± 13.5 (50.4-127)	94.7 ± 18.5 (13.7-154)
B-wave Amplitude (μV)	194.1 ±142 (9.3-802)	184.8 ± 144.5 (-17-802)

Photopic 1: Flash 3.0 cd s/m² at 2 Hz

Variable	AUTOMATED (n = 44) Mean ± SD (Range)	MANUAL (n=48) Mean ± SD (Range)
A-wave Implicit Time (ms)	14.5 ± 5.7 (8.8-80.5)	14.3 ± 5.8 (8.1-80.5)
A-wave Amplitude (μV)	-12.7 ± 8.6 (-62.6-9.6)	-11.7 ± 10.1 (-62.6-32.4)
B-wave Implicit Time (ms)	31.6 ± 4.3 (27.7-71.7)	32 ± 5 (27.7-71.7)
B-wave Amplitude (μV)	104 ± 39.1 (8.7-241)	106.5 ± 42.7 (17-241)

Scotopic 2: Flash 3.0 cd s/m² at 0.1 Hz

Variable	AUTOMATED (n = 33) Mean ± SD (Range)	MANUAL (n=48) Mean ± SD (Range)
A-wave Implicit Time (ms)	14.1 ± 1.8 (11.5-23.5)	13.6 ± 2.3 (7-23.5)
A-wave Amplitude (μV) *	**-48.7 ± 36.4* (-232-7.9)**	**-23.7 ± 71.3* (-232-229.6)**
B-wave Implicit Time (ms)	62.6 ± 18 (30.7-99.7)	63.3 ± 17.9 (30.7-101.3)
B-wave Amplitude (μV)	339.4 ± 144.5 (25.7-719)	437.3 ± 285.2 (25.7-1692.6)

Photopic 2: Flash 3.0 cd s/m² at 28.3 Hz

Variable	AUTOMATED (n = 32) Mean ± SD (Range)	MANUAL (n=48) Mean ± SD (Range)
Flicker Implicit Time (ms)	26.5 ± 1.6 (13.6-30.9)	26.6 ± 2.2 (13.6-30.9)
Flicker Amplitude (μV)	55.3 ± 25.8 (-23-146)	55.3 ± 25.8 (-12-146)

Conclusions

- There was no significant difference between the machine generated data and the manually extracted data, except for Scotopic 2 a-wave amplitude.
- These findings will be relayed to LKC Technologies to fine tune the data automatically generated by the device.

Acknowledgements

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