Electrodiagnostics in Neurological and Neuromuscular Diseases

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Electroencephalography (EEG)

- Sleep
- Seizures
- Behavior

Epilepsy

Aleman et al. JVIM 2006;20:1443-1449
Sleep deprivation

Brainstem evoked response (BAER)
Auditory function

BAER
Aleman et al. JVM 2014
Abnormal BAER

Neuroophthalmology

Vision:
Visual evoked potentials
Electroretinography

Eye movement:
Electrooculography

Visual evoked potentials (VEP)

Retina, brainstem, cerebral cortex
Electrophysiology

Electroretinography (ERG)

Sensory

Somatosensory evoked potentials (SEP)
Sensory nerve conduction (SNC)
Sensory nerve conduction velocity (SNCV): Trigeminal complex

Aleman et al. JVIM 2013;27:1571-1580

SNCV: Trigeminal complex

Aleman et al. JVIM 2013;27:1571-1580

SNCV: Trigeminal complex

Aleman et al. JVIM 2013;27:1571-1580
Motor

Motor nerve conduction
Repetitive nerve stimulation

Neuromuscular disease:
Electrodiagnostics

<table>
<thead>
<tr>
<th>Electrodiagnostics</th>
<th>Standards</th>
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</thead>
<tbody>
<tr>
<td>Motions</td>
<td>Abnormal or widespread, denervated muscle (95% normal)</td>
</tr>
<tr>
<td>Propagation</td>
<td>Normal</td>
</tr>
<tr>
<td>Spontaneous activity</td>
<td>Normal (all types)</td>
</tr>
<tr>
<td>Posterior tibial nerve (PTN)</td>
<td>Normal</td>
</tr>
<tr>
<td>Compound nerve (CN)</td>
<td>Normal</td>
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<tr>
<td>Action potentials (AP)</td>
<td>Normal</td>
</tr>
<tr>
<td>Motor NCV</td>
<td>Normal, latencies, delayed DF, mildly decreased</td>
</tr>
<tr>
<td>Sensory NCV</td>
<td>Normal, mild sensory in disease</td>
</tr>
<tr>
<td>NCS</td>
<td>Normal, sensory conduction, minimal change</td>
</tr>
<tr>
<td>SFEMG</td>
<td>Normal, single fiber conduction</td>
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</tbody>
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Neuromuscular junction

Repetitive nerve stimulation
Single fiber electromyography (SF-EMG)
Botulism

- Acute progressive flaccid paralytic disease
- *Clostridium botulinum* toxins
  - BoNT A, B, C, D
- Forms
  - Adults
    - Food-borne
    - Wound (rare)
  - Foals
    - Toxicoinfectious

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Repetitive nerve stimulation (RNS)

Aleman et al. JVIM 2011;25:365-372

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RNS recordings

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RNS recordings

4A CONTROL
4B CASE 1

RNS

Electromyography (EMG)
Myopathies/channelopathies

- Hyperkalemic periodic paralysis (HYPP)
- Complex repetitive discharges (CRD)


Neuropathies

Muscle/nerve biopsy

Aleman. VCMA 2011;27:481-504