

PHISIOOTHERAPY EFFICIENCY IN DOGS WITH POLYRADICULONEURITIS

Alexandru URSACHE, Mădălina-Elena HENEA, Georgiana-Andreea TIPĂ,
Gabriela-Dumitrița STANCIU, Gheorghe SOLCAN

Universitatea de Științe Agricole și Medicină Veterinară "Ion Ionescu de la Brad", Facultatea de
Medicină Veterinară, Aleea Mihail Sadoveanu nr. 8, 700489, Iași, Romania
gsolcan@uaiasi.ro

Abstract

Idiopathic polyradiculoneuritis is an acute demyelinating disease characterized by inflammatory damage of the entire peripheral nervous system. In veterinary medicine it is more common in dogs and rarely diagnosed in cats. This rare disease is characterized clinically by progressive flaccid quadriplegia and hyporeflexibility, facial paralysis and laryngeal weakness. The aim of the current study was to describe the physiotherapy treatment methods for patients diagnosed with this condition. Recovery after physiotherapy sessions in patients diagnosed with idiopathic polyradiculoneuritis was reported in 5/6 cases. Physical therapy is the main method of recovery, requiring close collaboration between veterinarian and owner for positive results.

Keywords: *physiotherapy, polyradiculoneuritis, recovery*

Background

Acute idiopathic polyradiculoneuritis, an animal model for the axonal form of Landry-Guillain-Barré syndrome in humans, is a potentially fatal acute demyelinating disease characterized by inflammation and damage of the peripheral nervous system. (8, 9, 10) Clinical signs consist of rapid emergence and progressive muscle weakness that typically occurs in the hind limbs and progressing cranially and in some cases leading to partial or complete aphonia. Clinical signs usually worsen over a period of 10 days finally leading to complete paralysis, and death can occur through paralysis of the respiratory muscles. In humans, the disease can occur at any age, with an incidence of 1-2 cases per 100,000 inhabitants. In children it may occur between 10 months and 15 years of age with a maximum frequency between 3 and 5 years and affects both sexes equally (1,5). In dogs it has been demonstrated that the disease can occur more frequently in females. The condition usually occurs consecutive to a viral infection (cytomegalovirus, Epstein-Barr, virus varicellozoosterian, herpes virus, measles virus). It has also been reported after a bacterial infection with *Mycoplasma pneumoniae*, *Campylobacter jejuni* (1, 5) and after vaccination (in particular influenza vaccine). The mechanism appears to be autoimmune (1, 5), probably triggered by raising peripheral lymphocytes as a response to a protein component of myelin (the result is the most common in viral aggression), followed by destruction of myelin through the migration of sensitized lymphocytes in the peripheral nervous system. According to another hypothesis, the pathogen can damage Schwann cells with secondary release of antigens that through immune mechanism leads to segmental demyelination. It results in blocking the nervous impulse driving to clinical symptoms (paralysis, areflexia). Depending on the cause, the disease can occur after raccoon bites or scratches (coonhound paralysis - North America), idiopathic and as a post-vaccine response (2, 3, 4, 5, 6, 10).

Materials and method

Our study consisted of six dog patients selected from casuistry of Internal Medicine Clinic of Faculty of Veterinary Medicine, University of Agricultural Sciences and Veterinary Medicine from Iași, with an average age of six years, all diagnosed with polyradiculoneuritis. The diagnosis was based on neurological examination and investigations using electromyography and nerve conduction tests (figures 1 and 2) (8, 9, 10) with unit Neuropack S, K 9400 MEB Electromedical System (Nihon Kohden).

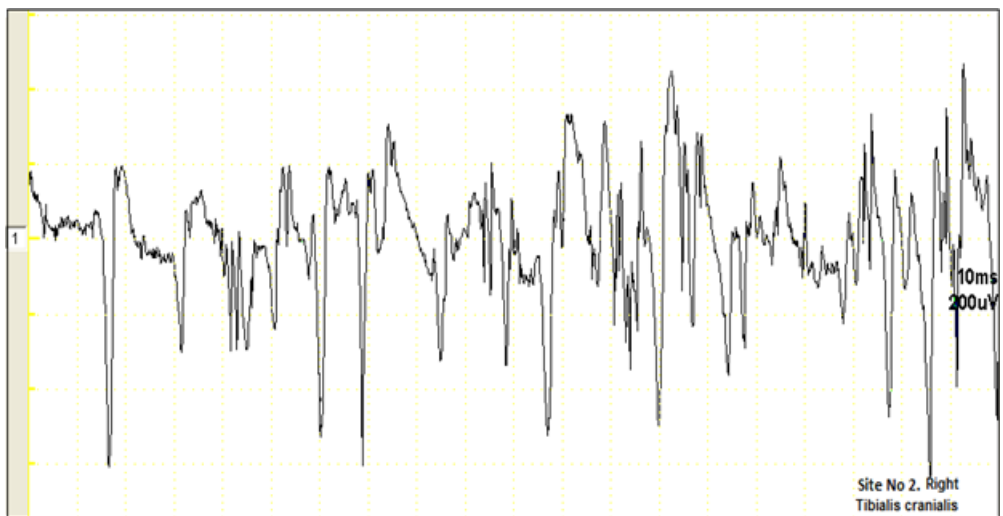


Figure 1. EMG of the cranial tibial muscle - moderate spontaneous activity consists of a combination of potential fibrillation (predominant) and occasional sharp slow wave

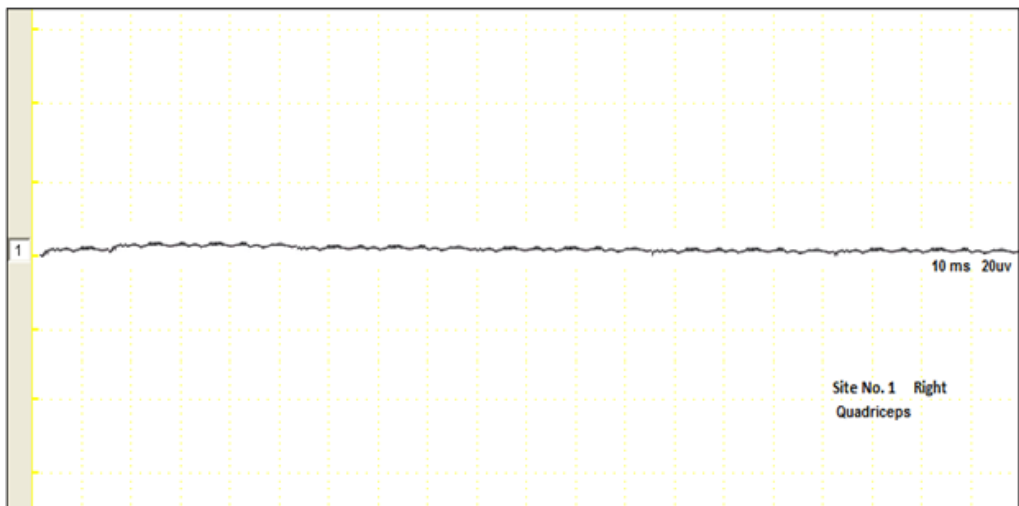


Figure 2. Right quadriceps muscle EMG – note the physiological route of the muscle at rest compared with previous records

Physiotherapy was made using the Intellect®Vet device, equipped with two independent channels of electrotherapy that has 4 types of currents - Interferential, Premodulated, Russian, High Volt, and an ultrasound probe with a frequency of 1-3 MHz used in the rehabilitation of patients with orthopedic or neurological problems. Thus, the device offers 4 methods of therapy in a secure system, namely: electrical stimulation, ultrasound stimulation, ultrasound combination and laser therapy. Regarding electrostimulation in the first 10 sessions we used a schedule for reducing muscle spasms and pain relief, followed by 20 sessions of stretching, muscle toning balls, special physiotherapy and balanceplatforms used to regain proprioception and gels for therapeutic massage. Transcutaneous neuromuscular electric stimulation was applied to the motor points (Figures 3,4 and 5) after the area of interest was clipped and disinfected and the adhesive electrodes were applied using a small amount of gel special for electrotherapy to facilitate the transmission of electric current. Physiotherapy and physical therapy sessions lasted an average of two hours, using passive and active range of motion to avoid loss of muscle mass. In order to improve proprioception special balls were used for physiotherapy and balance sheets. At the end of meetings, we massaged

the affected regions using revulsion gels for improving blood circulation, followed by flexion and extension movements to keep muscle tone.



Figure 3. Transcutaneous neuromuscular electric stimulation applied to the motor points (Shiela, 8 years)



Figure 4. 8 years old female during physiotherapy session



Figure 5. Applied electrodes on area of interest (6 years old male)

Results and discussions

One case was diagnosed with post-vaccination polyradiculoneuritis and others with idiopathic form, five were females and only one male. The patients clinically manifested flaccid quadriplegia, hyporeflexion and aphony, keeping the appetite for food and water. To rehabilitate patients a minimum of 90 sessions of physiotherapy were necessary for the complete recovery. An 8 years old female, Carpathian shepherd breed was euthanized because there was no improvement of the condition after two months. From all the patients in the study,

five patients were represented by females, that clearly denotes a sex predisposition for this disease. The average age of patients in the study was 6 years old. All patients received initially anti-inflammatory (prednisolone, dexamethasone) and neurotrophic therapy (vitamin B complex – Beforvel, Milgamma N), but this led to a lack of response. One patient, 3 months of age, Shih-tzu, female, presented clinical signs the day after the third vaccine (distemper, parainfluenza, parvovirus, adenovirus) and rabies vaccination (8), showing weakness in the hind limbs, followed by quadriplegia. Treatment was initiated with amoxicillin and prednisolone, but the owner did not notice any improvement, so after 6 days we instituted a program of physiotherapy consisting of electrotherapy, massage and kinesiotherapy. Improvements occurred after 7 days and after 3 weeks recovery was complete, this being the only case that recovered over a course of 20 sessions. Each individual responds differently to treatment and there is no average number of sessions to ensure recovery.

Conclusions

Recovery after physiotherapy sessions in patients diagnosed with idiopathic polyradiculoneuritis was reported in 5/6 cases. Physical therapy is the main method of recovery, requiring close collaboration between veterinarian and owner for positive results.

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