

Area of Research: **Clinical Neurology**

Mentor: **Dominik Faissler**

Project Description:

Add on therapy of levetiracetam in idiopathic epileptic dogs: Idiopathic epilepsy is one of the most common neurological problems in dogs. The cause is unknown but an imbalance between excitatory and inhibitory neurotransmitters is suspected. Some breeds are more affected. A recessive most likely polygenic mode of transmission is suspected. The course of the disorder is often slowly progressive which results in increasing seizure frequency and duration as well as worsening of the postictal phase. Therapy is limited to medical treatment. Initially, anticonvulsive medications like phenobarbital or potassium bromide used as monotherapy reduce seizure frequency and duration significantly in 65% to 85% of treated dogs. On a long term basis 10% to 50% percent of the dogs suffering from idiopathic epilepsy treated with a single drug start to be refractory (Farnbach, 1984; Derkx-Overduin, 1994; Podell, 1995). The combination of phenobarbital and bromide was shown to be successful in 65% to 72% of the dogs with a chronic seizure history. Adding on potassium bromide to the phenobarbital reduced seizure frequency more than 50% compared to the initial monotherapy. There are still 20% to 30% of the idiopathic seizing dogs who are not satisfactorily controlled, with the combination therapy of bromide and phenobarbital. The lack of alternative treatments in dogs or the limited long-term use of phenobarbital because of its side effect on the liver warrants a third medication or the replacement of phenobarbital. A newer drug levetiracetam was prescribed in several dogs and some of them showed improved seizure control.

Goal: The goal of this project is to evaluate seizure frequency, duration, the occurrence of cluster seizures, and the quality of the postictal period before and after the additional therapy of levetiracetam to the previous medication schedule.

Data basis: Neuro data basis, so far 11 cases.

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Incidence of encephalitis in dogs: The terms encephalitis or meningoencephalitis refer to inflammation of the brain parenchyma and its meningeal linings. The most common reasons mentioned in the literature are distemper virus, other viral infections, protozoal and bacterial meningoencephalitis (Tipold, 1995, Heim et al, 1998). The second important group of disorders causing meningoencephalitis is the idiopathic inflammatory brain disease like granulomatous meningoencephalitis (GME), necrotizing encephalitis and eosinophilic meningoencephalitis. The diagnosis of these idiopathic inflammatory brain diseases in living dogs is based on CSF analysis, MRI imaging and exclusion of infectious disorders. For a definitive confirmation

histopathology or brain biopsy is needed. The treatment is difficult and often related to corticoids. Newer options are immune modulating medication like procarbazine or cytosine arabinoside. In contrast to other researchers the most common cause in dogs for meningoencephalitis here at Tufts University seem to be to the idiopathic inflammatory brain disorders. More data about incidence, clinical presentation, diagnostic possibilities and treatment options are needed to improve the approach to this group of brain disorders.

Goal: The primary goal of this study is to establish a data basis of the different causes for encephalitis or meningoencephalitis in dogs, and calculate the incidence of the different diseases. Our working hypothesis is that idiopathic inflammatory disorders of the brain are the most common cause for encephalitis or meningoencephalitis presented at Tufts University.

Database:

- CSF results clinical laboratory Tufts University
- Necropsy results Tufts University
- MRI reports Tufts University
- Case log neurology 2002