

HEALTH RESEARCH SUBCOMMITTEE

NEW SEIZURE STUDY

As previously reported, the Club is undertaking a new study on seizing under the guidance of Dr. Georgina Child, BVSc, DACVIM (Neurology).

In recent correspondence Dr. Child advised "I would always stress the information gained by such a project is useful for the health of the breed and to prevent the incidence of what is a condition that requires life-long management, often decreased quality of life, reduced survival time (due to seizures themselves or due to euthanasia) and significant heartache for many pet owners. Any inherited abnormality is not a good recommendation for a particular breed either". The Club, therefore, encourages all those interested in the welfare of the beagle to participate in this study.

Due to the loss of information gathered by Rob and Joan Medcalf for the previous study, the Club invites all members/beagle owners/beagle breeders who had previously provided information for the study to resubmit the information for inclusion in the new study on the attached Authorisation Form.

In addition, any member who wishes to participate in the new study should also use the attached form.

The Authorisation Form should be completed and returned to

Bev James, Lot 12 McHale Way, Nelson NSW 2765

If you have any enquiries please phone Bev on 9679 1169 or email

donleebeagles@aapt.net.au

The following article is reprinted with the kind permission of Dr Georgina Child. B.VSc., DACVIM (Neurology). We are most grateful to Dr Child for this article and for her guidance and commitment to the seizure study of the Beagle Club of NSW Inc.

Seizure disorder in dogs

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Seizures, fits or convulsions are a relatively common disorder in companion animals. More than one in one hundred people have a seizure disorder and the incidence of seizures in dogs has been estimated at 1-5% of all dogs. A seizure is a transitory disturbance of brain function. Seizures may be generalised due to a generalised brain disturbance or seizures may be partial arising from a specific area of the brain. Generalised seizures (grand mal type) are characterised by loss of consciousness, muscle rigidity, involuntary running or paddling movements, salivation, urination and/or defecation. Although generalised seizures are distressing to see, they are usually brief lasting less than 2 minutes. Generalised seizures may be preceded by an aura or period where dogs seem anxious, seek owners or are hyper excitable. Partial seizures vary in nature depending on the area of brain from which they arise but possible abnormalities seen include involuntary movements, abnormal behaviour, and gastrointestinal signs but animals remain conscious, although mentation may be altered (staring, aggressive, or "not all there"). Partial seizures may last for a longer period of time than generalised seizures. Absence or petit mal seizures with blank staring and reduced muscle tone, seen in people are rarely recognised in dogs. The post ictal phase is the period immediately after either a generalised or partial seizure. In this phase animals often may seem exhausted and sleep or may seem restless, pace constantly, walk in circles, seem disoriented and/or "drunk". Dogs may seem blind or even

demented. They are often thirsty or hungry. The post ictal phase may last from minutes to days and the length may not bear any relationship to the length of the seizure episode. Seizures may occur in clusters with more than one seizure seen in a short period of time.

Epilepsy is a term generally used to describe a disorder characterised by recurrent seizures. Epilepsy may be due to one of a number of causes.

Seizures may be the result of abnormalities outside of the brain (extra cranial) or due to a primary brain abnormality (intracranial). Reactive seizures are due to extra cranial causes such as metabolic disturbance or toxic insult. Metabolic disturbances that can cause seizures include low blood glucose, low blood calcium, high blood potassium, liver disease, kidney failure and hyperlipoproteinemia. Lead, snail bait (OP and carbamate), strychnine and 1080 poisoning can cause seizures in dogs. This type of seizure is generally controlled when the underlying cause is treated however if damage has occurred to the brain as a result of a prolonged metabolic or toxic insult epilepsy may result.

Symptomatic seizures occur as a result of a structural brain abnormality. Brain abnormalities that can cause seizures include congenital brain anomaly (eg hydrocephalus), head trauma, encephalitis (brain inflammation), brain tumour or cerebrovascular accident (stroke). Seizures may not be seen for weeks, months or years after brain injury occurs. In some instances the underlying cause of the seizures may progress and other neurologic abnormalities are seen (for example in animals with tumours or encephalitis) but in other cases the structural brain abnormality may be static (for example in animals with prior head injury or vascular accident) and recurrent seizures (epilepsy) the only abnormality seen. **This form of epilepsy has been called acquired or symptomatic epilepsy.** Partial or generalised seizures may be seen in acquired epilepsy.

Idiopathic epilepsy refers to a seizure disorder where no underlying cause of seizures can be established. This is the most common cause of seizures in dogs. Idiopathic epilepsy is likely to have a genetic (inherited basis) in many cases. This form of epilepsy is also called genetic, inherited or primary epilepsy. **However some cases of idiopathic epilepsy may have a structural cause (for example birth injury) which cannot be confirmed by routine examination as seizures may not be seen for years after the brain insult. This form of epilepsy has been termed cryptogenic (from the Greek meaning hidden).**

Idiopathic epilepsy presumed due to genetic abnormality is typically characterised by generalised (grand mal type) seizures. However partial seizure disorders have been recognised in related dogs and some partial seizure disorders may in fact be inherited. Idiopathic epilepsy has been shown to be inherited in beagles. Data suggests that it is also inherited in German shepherd dogs, Keeshonds, Belgian (Tervuren) shepherd dogs, dachshunds, English Springer spaniels, Irish wolfhounds, Hungarian Vizslas and collie dogs. Several breeds have been reported to have a high incidence of seizure disorders including golden retrievers, German shepherd dogs, Irish setters, Saint Bernards, American Cocker Spaniels, wirehaired fox terriers, Alaskan Malamutes, Siberian Huskies, Welsh springer spaniels, Labrador retrievers, miniature schnauzers, mastiffs and poodles. Epilepsy may have an inherited basis in these breeds.

Epilepsy may occur in any breed including cross bred dogs and the incidence of epilepsy (1-5%) seems to be constant across breed boundaries. One study suggests the apparently high incidence of seizure disorders in certain breeds may reflect the popularity of these breeds. In my practice boxers, Border collies, Dalmatians and Maltese terriers are over represented but all are currently popular breeds as family pets. Male dogs may have a higher incidence of genetic (primary) epilepsy than females. Acquired or symptomatic epilepsy may be seen in any breed of dog of either sex. An increased frequency of seizures may be seen in females during oestrus or pregnancy and it is not uncommon for females to have their first seizure when in season.

Genetic or primary (idiopathic) epilepsy is most often recognised in dogs between 1 and 3 years of age however dogs may have their first seizure before 6 months or older than 3 years. Acquired epilepsy and reactive seizures may be seen in dogs of any age. Dogs that have their first seizure at less than 3 years of age are most likely to have idiopathic epilepsy. Dogs that have their first seizure 7 years of age or older are much more likely to have acquired epilepsy which is more likely to have a progressive cause (for example brain tumour).

What should an owner do if a dog has a seizure and how should possible causes be investigated?

If a dog is found seizing Make sure that furniture and other obstacles are moved out of the way and the dog cannot injure itself. Do not attempt to hold the dog or put anything in its mouth as the dogs actions are involuntary, mentation is altered and the dog may bite.

Generalised seizures generally last less than 2 mins although seem to last a much longer time to worried owners. If a seizure lasts longer than 2-3 minutes with no muscle relaxation or if the dog has more than 2 seizures in quick succession seek emergency veterinary attention. If a dog has 1 or 2 short seizures supervise the dog closely until the dogs behaviour returns to normal and seek veterinary attention when convenient.

All animals that have had even one seizure should have a thorough physical and neurologic examination.

Collapse due to cardiac disease can be confused with a seizure and evidence of heart or lung abnormality may be found on exam. A neurologic examination is most important to determine whether any other neurologic abnormalities are present in addition to seizures. It is important that a neurologic exam be performed when the dog is not sedated or in a post ictal state as many animals show transient neurologic abnormalities for minutes or hours (even days) after a seizure.

Animals with idiopathic epilepsy will usually show no neurologic abnormalities between seizures. Animals with a progressive brain disease causing seizures such as encephalitis or brain tumour will often have neurologic abnormalities on examination . Some dogs with brain tumours may have a normal neurologic examination for some time (up to 18 months) after seizures are first seen.

A complete blood count and biochemistry profile should be performed to investigate possible metabolic or extra cranial causes of seizures. In animals less than 1 year of age or any animals of any age with other abnormalities suggestive of hepatic encephalopathy, a liver function test (fasted and post prandial total bile acids or an ammonia tolerance test) should also be performed. Portosystemic shunts are more common in some breeds including Maltese terriers, Australian cattle dogs, miniature schnauzers, irish Wolfhounds , miniature poodles and Yorkshire terriers. A 24 hour fasting blood glucose determination should be made in dogs over 3 years of age to check for hypoglycaemia associated with pancreatic tumour (insulinoma). Miniature schnauzers should be checked for hyperlipoproteinemia on a 24 hour fasted blood sample. Most toxins causing seizures also result in other neurologic abnormalities and cause a sudden onset of severe clinical signs but lead poisoning can result in recurrent seizures and any dog with access to lead sources should have a blood lead determination.

If metabolic and toxic causes of seizures have been ruled out the decision to do further diagnostic tests depends on the results of neurologic examination and the animals age. Any dog of any age with seizures and abnormalities on neurologic exam that are progressive (getting worse) is likely to have a progressive intracranial disease such as encephalitis, tumour or neurodegenerative disorder. Further tests such as CSF analysis (spinal tap) and/or brain imaging (CT or MRI scan) should be considered.

Dogs with a normal neurologic exam and recurrent seizures that are 5 years of age or younger are most likely to have idiopathic epilepsy (if generalised seizures) or symptomatic epilepsy (if partial seizures). No further diagnostic tests are usually recommended unless the dog goes on to show neurologic abnormalities between seizures suggesting a progressive problem.

Dogs that are older than 5 years of age when seizures are first seen are most likely to have an acquired cause. Some of these dogs will have a progressive cause such as brain tumour. These dogs should be monitored closely and if seizures increase in frequency or more importantly if neurologic signs are seen between seizures further diagnostic tests should be considered.

If an underlying cause of seizures is found specific treatment should be given.

If idiopathic or acquired epilepsy is diagnosed the decision on whether or not to start treatment with anticonvulsant medication depends on seizure frequency and severity.

The frequency of seizures in epileptic animals is extremely variable - from 1 or 2 seizures in a lifetime to multiple seizures each day. Animals that seizure infrequently (less than 1 seizure every 4-6 weeks) do not require medication unless seizures are long, are accompanied by intolerable behaviour changes, or seizures are distressing to the owner.

Dogs that seizure more frequently than 1 seizure a month, or have seizures in clusters (more than 2 seizures in 24 hours), or have ever had an episode of status epilepticus (continuous seizing) or have prolonged seizures (> 5 mins) should be treated with anti convulsant medication. **There is evidence to suggest the more seizures an animal has the more likely it is to seizure again, as if the brain becomes 'wired' to seizure more easily. Early institution of anticonvulsant therapy may result in better seizure control although starting therapy after a single seizure may result in unnecessary treatment of dogs that would have seized very infrequently.**

Anticonvulsant medication is a long term and often lifetime commitment. Medication needs to be given every day at regular intervals. The most effective anticonvulsant in dogs is phenobarbitone. Animals may be sleepy (sedated) and wobbly for first 10-14 days but do become tolerant to the sedative effects of the drug after this time. Occasionally dogs will become hyperactive and excessively vocal - this effect also subsides generally with continued treatment.

Potassium bromide may be used if seizures are not well controlled with phenobarbitone alone or if the side effects of pentobarbitone are not tolerated. Bromide will take 16 weeks to reach a steady blood level. Many of the anticonvulsant drugs used to treat epilepsy in humans are not effective in dogs. Anticonvulsant medication will reduce the incidence of seizures in most animals (70%) with epilepsy although treatment may not eliminate seizures completely. The aim of treatment is to reduce the frequency and severity of seizures. Animals on long term anticonvulsant medication require veterinary reassessment regularly and monitoring of blood drug levels and liver function (yearly or more frequently if higher drug levels are required to control seizures).

Many epileptic dogs lead normal happy lives with very few, if any, side effects associated with their medication. Side effects associated with anticonvulsant drugs may be seen with higher doses and in some cases medication induced complications have to be weighed against the benefits of treatment. Treatment may fail for several reasons including improper administration (forgetting doses, dog spitting tablets out), gastrointestinal upset preventing drug absorption and interactions with other drugs. The salt (chloride) content of a dog's diet will affect the absorption of Bromide. Oestrus in females may cause an increase in seizure frequency.

Some animals with epilepsy will continue to have severe seizures and require intensive medical management despite daily medication. Increased frequency and severity of seizures is not necessarily an indication of an underlying progressive brain disease. Approximately 20-30 % of epileptics will become refractory to treatment and continue to have more frequent seizures despite high levels of medication. Although an increase the severity of seizures does not indicate an underlying progressive disease in most cases, brain damage can occur in refractory epileptics due to repeated seizures. Seizures can be life threatening if status epilepticus occurs (continuous seizing) due to brain hypoxia (lack of oxygen) and /or hyperthermia (heat stroke) due to the development of cerebral oedema (brain swelling).

Desexing should be considered in all epileptic dogs. Females have a higher incidence of seizures during oestrus.

Idiopathic epilepsy is likely to be genetic and therefore potentially heritable and although it is difficult to say with absolute certainty epilepsy in any individual is genetic, affected animals should not be bred from (males or females). The mode of inheritance of epilepsy varies between breeds. Affected dogs may not appear in all litters or in all generations. Dogs related to those with seizure disorders should be monitored carefully and breeding programs altered accordingly. Unfortunately epilepsy is a trait that may not be seen until dogs are several years old. Careful record keeping for many years is imperative in determining the incidence of seizures and recognising any potential problems related to breeding in an effort to reduce the incidence of this disorder.

THE BEAGLE CLUB OF N.S.W. INC.

CONFIDENTIAL

SEIZURE STUDY

Commencing June 2006

AUTHORISATION FORM

I/We hereby authorise the information provided hereunder to be used in the above study. The information is to be provided to Dr. G. Child by the Club's Health Research Subcommittee on a confidential basis.

Name of beagle: _____

Sex: M / F

Date of Birth: _____

Owner: _____

Address: _____

Phone: _____

Email: _____

Pedigree attached: Y / N

If pedigree not available

Sire: _____

Dam: _____

Breeder: _____

Purchased from: _____

Photo enclosed (if requested): Y / N

Age of onset: _____

Frequency: _____

Veterinary diagnosis: _____

Type: Generalised / Grand Mal / Partial

Treatment: _____

Outcome: _____

Signature(s): _____ Date: _____