The use of seizure-alert dogs

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We report our experience of training dogs to assist people with epilepsy by providing a useful warning of seizures. An unexpected finding has been that human subjects report an improvement in seizure rate. This may be related to increased confidence and activity levels. We have observed some hazards associated with untrained dogs, which raises questions about future experimental design. We plan further research to test our method and assess outcomes more formally. Recent changes in UK quarantine law provide an opportunity for further international collaboration.

Key words: pets; epilepsy; seizure alert dogs.

BACKGROUND

There are many reports of the benefits of animal companions for people with disabilities1–3. These range from non-specific effects on health and well-being, to specific assistance, e.g. for those with visual or hearing impairment.

Some doctors who treat epilepsy (and who listen to what their patients tell them), will have heard anecdotal reports of pet dogs reported to display some sort of premonitory behaviour before their significant human has a seizure. This behaviour is often reported to occur when neither the person with epilepsy nor other family members share the premonition.

HAZARDS OF UNTRAINED DOGS

We have a number of anecdotal reports of dogs exhibiting particular behaviours during or after human seizures, and this behaviour is also reported in dogs that spontaneously anticipate human seizures4. These behaviours include attacking the person with epilepsy, helpers or passers-by. In some cases this may generalize so that the dog exhibits aggression to other similar humans, e.g. children. The general reaction seems to include elements of flight, fright, ‘freezing’, or appeasement. One dog choked on a lead with a flight reaction. It is not known how common this particular problem is. Of people with seizure disorders self-referring to the charity Support Dogs, only eight already had pet dogs. However, all eight had problems of the sort described above. We currently know of another 28 cases. It is not known how common this problem is, but if it is widespread, serious issues arise about the suitability of untrained pet dogs for people with epilepsy. We hope to complete a population-based study in the next two years to gain a clearer picture.

CAN DOGS BE TRAINED PROPERLY?

Questions arise as to whether pet dogs can be trained not to exhibit such deleterious behaviour, and furthermore whether they could be trained to produce alternative, helpful, behaviours. Our experience is clearly that the answer to both questions is ‘yes’.

Our Seizure-Alert Dogs are specially chosen for this work, and are not dogs that are already pets of people with epilepsy. They are socialized by working closely with a trainer and the person with epilepsy simultaneously. Their response to human seizures is modified by the use of an intensive reward-based operant conditioning regime. This starts in a specially controlled and monitored residential setting, and is later general-
ized to everyday life. So far 20 dogs have been trained, of which six have been reported previously. A trained dog can anticipate a seizure in a significant human, and provide a warning to the person 15–45 minutes beforehand, even if the human has no other warning. The dog is not stressed by the event if properly trained.

An unexpected finding in our early work was that with continued use of a seizure-alert dog, the person’s seizure frequency was often reported to show an improvement.

**SOME FREQUENTLY ASKED QUESTIONS**

**Do dogs cause seizures in these cases?**

The observation that human seizures may be preceded by a stereotyped canine behaviour raises a question about cause and effect. However, we feel that if dogs were causing seizures by raising an expectation in the humans, it would be very unlikely that seizure rates would reduce, although that is what was reported. Indeed it might be expected that seizures would increase in frequency in at least some instances, but no such case has been observed.

**Are dogs harmed or stressed?**

As far as we can tell from our work so far, properly trained seizure-alert dogs do not suffer any adverse health consequences from human seizures. We would suggest that this is because the operant conditioning programme involves associating a positive reward for the dog with a human seizure. Because our dogs are trained alongside the humans and have no previous experience of human seizures, their only association is a positive one. This is obviously an important issue, and we hope to address it in more detail in the future.

**Is this a new treatment for non-epileptic seizures?**

It is entirely possible that this approach might have benefits for people with non-epileptic seizures. If this turned out to be the case, we would certainly not be disheartened. However, the people treated by us were all under the care of neurology specialists, and in all cases the neurologist considered that the patient had true epilepsy. Like the question above, we recognize that this is an important issue, and wish to address it in more detail in subsequent studies.

**Why should the seizure rate reduce?**

Various factors relating to lifestyle or social circumstance have been reported to affect seizure frequency. People may avoid some activities because they fear the consequences of unpredictable seizures in public. If they then acquire a useful warning of seizures, they may feel encouraged to take part in more activities, and socialize more. The locus of control for the individual may shift internally. Activity levels and perceived self-efficacy are known to be related to severity of epilepsy. Seizure-alert dogs may therefore theoretically exert a positive influence on human seizure frequency by such secondary effects on confidence, level of activity, locus of control and perceived self-efficacy. For the time being however, these remain evidence-free guesses.

**What is it that the dogs are detecting?**

Our opinion, based on observation, and bearing in mind the training method that has been developed, is that the dogs detect subtle changes in the behaviour of the human subject that characteristically precede a clinical seizure.

**FUTURE PLANS**

We are just completing a more detailed $n = 10$ study which will be reported in due course. This will provide more detail than our previously published preliminary report, which was based on earlier work. We are about to commence a new and much more comprehensive $n = 30$ study. This will include measurement of physiological responses in the dogs, as well as ambulatory EEG monitoring of a sample of the human subjects to confirm diagnosis. It will also incorporate measures of seizure frequency and severity, together with appropriate quality-of-life measures. Because of the potential adverse effects of human seizures on untrained dogs, we do not feel it is appropriate to include a control group of this type. Apart from this, we feel that we have set a higher standard for diagnosis and follow-through than in many antiepileptic drug trials.

**FURTHER OPPORTUNITIES**

Recent changes in the UK quarantine law, and the introduction of animal passports, provide an opportunity for the work of support dogs to be extended beyond the United Kingdom. This would allow a standardized approach to training and would help to avoid hazards of untrained or inappropriately trained dogs.
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A WORD FROM A CUSTOMER . . .

One of our clients, whose trained support dog is called Rupert, said, ‘Before I had Rupert, I had a lot of epilepsy and a little bit of life. With Rupert I now have a lot of life with a little bit of epilepsy!’

REFERENCES


