Hydatid in Animals

**E. granulosus** infection in animals

The domestic dog (*Canis lupus familiaris*) is the principal definitive host of *E. granulosus* but in some regions of the world, wild canids, including the Arctic fox (*Alopex lagopus*) found in the Arctic region of the Northern Hemisphere and the red fox (*Vulpes vulpes*) found in urban and rural habitats of the UK, Europe and North America are included in the life cycle of the parasite.

*E. granulosus* penetrates deeply between the villi of the small intestine of the definitive host but appears to cause no effects, even when the animal is heavily infected. Definitive hosts are thus asymptomatic carriers. Studies in some parts of the world have shown that young dogs are likely to be more heavily infected than older dogs, suggesting differences in the immune responses of dogs to intestinal worm infections.

Identification of *E. granulosus* infection from the faeces of living dogs is difficult. A coproantigen ELISA is available as a screening test for individual dogs or dog populations and large numbers of dogs can be screened in this way. Praziquantel is the drug of choice for treating infected dogs.

*Echinococcus* eggs stick to the coat of dogs, particularly to the hairs around the anus and on the thighs, muzzles and paws.

Infections in intermediate hosts (e.g. sheep) are typically asymptomatic. There are no routine, reliable methods for diagnosis in living animals. The most reliable diagnostic method is through detection of cysts during meat inspection or at post-mortem examination. Losses are primarily economic, through loss of meat production. Sheep do not develop strong immunity against *E. granulosus* as both the prevalence and intensity of infection with *E. granulosus* cysts increases with age of the sheep.

Hydatid infection in food animals is in nearly all cases confined to the lungs and the liver; infected organs must be condemned and destroyed. It has been estimated that 1% of sheep offal and 0.5% of cattle offal is condemned annually as a result of hydatid disease.
Control and Prevention programs

A veterinary control programme organised by the State Veterinary Service and supported by the Welsh Office was set up in 1983 in South Powys. During the control period the prevalence of hydatid cysts in old sheep from South Wales declined. In 1993 prevalence of cysts was 13%. Prevalence of *E. granulosus* was zero in the control area in 1993, but was 2.4% in Powys dogs outside the control area in 1989.

A review of hydatid disease in Wales found that the average annual incidence of human hydatid disease in Powys, mid-Wales, fell from $3.9 \times 10^{-5}$ in 1974-83 to $2.3 \times 10^{-5}$ in 1984-90. Age specific incidence rates declined over this period only in children and no cases occurred in children (<15 years) in Powys.

Human hydatid disease appeared to have been successfully controlled in South Powys but cystic disease remains endemic in sheep in mid Wales. There is considered to be considerable potential for an upsurge in human cases if control measures are relaxed.

There are two principal options for control and prevention of *E. granulosus*:

- Long-term public health education through primary health care and veterinary public health activities, such as improvements in meat inspection.

- A legislative-based approach which includes measures targeted at interrupting parasite transmission (attack phase). This approach requires the collection of baseline data on the prevalence of *E. granulosus* infection in the target dog population, the age-dependent prevalence of cysts in sheep and human cases of Hydatid disease.

Coproantigen ELISA tests can be used to detect the presence of *E. granulosus* in the dog population.

Control measures include the treatment of all dogs with praziquantel at predetermined intervals (usually 6-8 weeks). This attack phase may take 15 years or more.

After the parasite load has been reduced during the attack phase, further measures may be required during the subsequent consolidation and maintenance phases. A vaccine for use in intermediate hosts is not available.

References

1. Palmer SR, Biffin AHB, Craig P S, Walters TMH. Control of hydatid disease in Wales *BMJ* 1996; 312; 674-675