Deworming frequencies in cats and dogs – when is monthly deworming essential?

Whether and when we should use monthly prophylactic deworming regimes in our cats and dogs is a question that is often debated by the veterinary profession across the UK. In the absence of endemic heartworm (Dirofilaria immitis) and Echinococcus multilocularis which drive deworming frequencies in large parts of the US and Europe, thoughts turn to which helminths are of major concern in UK cats and dogs. Toxocara spp and Echinococcus granulosus are zoonotic and Angiostrongylus vasorum is potentially highly pathogenic to dogs even if present in low numbers. It is the risk of exposure to these parasites which forms the basis of UK deworming guidelines. This article considers a risk based approach for establishing whether monthly deworming of UK cats and dogs is required as well as discussing other worm control strategies.

Key words: toxocarosis, Echinococcus granulosus, Angiostrongylus vasorum zoonosis, cats, dogs, chemoprophylaxis

Introduction

Whether and when we should use monthly prophylactic deworming regimes in our cats and dogs is a question that is often debated by the veterinary profession across the UK. In large parts of Southern Europe and America, monthly prophylaxis against roundworms is routine due to the presence of heartworm (Dirofilaria immitis). Similarly in countries where Echinococcus multilocularis is endemic, monthly tapeworm prophylaxis is recommended due to zoonotic risk. These parasites are not currently endemic in the UK and so when considering deworming frequency for UK cats and dogs, the zoonotic and health impact of endemic helminths here must be assessed and evidence based recommendations made.

Disease in cats and dogs caused by helminths in most cases is correlated with worm burden. Monthly tapeworm treatment may be adopted in cats and dogs with visible tapeworm proglottids due to the owner revulsion these segments cause, but less frequent treatments for tapeworm infections are normally adequate to control clinical disease in cats and dogs. This knowledge and evidence that deworming every 3 months reduces Toxocara spp ova output (Wright & Wolfe, 2007) has led to a policy of deworming 4 times a year, and this is adequate to avoid clinical disease in most infestations. The exception to this rule in the UK is Angiostrongylus vasorum which may cause disease even if low worm burdens are present. Monthly prophylaxis must therefore be considered for dogs at risk of exposure to the parasite. This article considers these risks as well as the zoonotic risk posed by Toxocara spp and Echinococcus granulosus in the UK which may also affect decisions regarding how often we deworm pets.

Helminths in the UK that may justify monthly chemoprophylaxis

Angiostrongylus vasorum

The life cycle of A. vasorum is summarised in Figure 1. First stage larvae (L1) pass out in the faeces and require gastropod molluscs (slugs and snails) as intermediate hosts for further development. Infection occurs in canids when infective third stage larvae (L3) are ingested. This occurs most commonly through deliberate or accidental consumption of infected slugs or snails (Morgan, Shaw, Brennan et al, 2005).

The most common clinical presentation in dogs is mild to moderate pulmonary signs. The most significant of these are coughs (either productive or unproductive), and dyspnoea, with or without tachypnoea. A less common but more severe consequence of infection is a varying degree of coagulopathy (Morgan, Shaw, Brennan et al, 2005). The mechanism of this aspect of infection is still poorly understood but can lead to...
potentially life threatening signs including anaemia, haematomas, neuropathies, increased and prolonged post-operative bleeding and post traumatic haemorrhage. Cardiac signs are relatively rare with pulmonary hypertension occurring in less than 5% dogs infected with *A. vasorum* in primary practice (Koch & Willeesen, 2009). Although less common, these more severe signs can occur even if the parasite is present in low numbers.

Treatment of angiostrongylosis consists primarily of effective anthelmintic treatment with supportive treatment as required. Fenbendazole remains a popular treatment and is efficacious at 25-50 mg/kg for 5-21 days (Koch & Willesen, 2009) but is not licensed as a treatment for *A. vasorum*. The reasoning behind fenbendazole use is that it produces a “slow kill” and therefore reduces the risk of anaphylaxis but there remains no peer reviewed data to support this theory. There are a number of moxidectin spot-on solutions and milbemycin tablets licensed for treatment and prophylaxis of *A. vasorum*. Licenses are constantly changing and should be checked for efficacy and prevention claims. Moxidectin requires a single monthly spot-on application to eliminate infection, whereas milbemycin oxime requires weekly oral administration for 4 weeks. Both are highly efficacious treatments and if clinical disease is caught early, prognosis is favourable. The potentially fatal outcome if disease is left unchecked however makes early diagnosis favourable. Diagnosis has traditionally relied upon the Baermann faecal analysis for the detection of L1 larvae. In experienced hands this can be highly specific but is relatively insensitive as larvae are only shed intermittently and requires examination of fresh faecal samples over 3 consecutive days to improve sensitivity. Misidentification of *A. vasorum* larvae with *Crenosoma vulpis* (Figure 2) or free living nematodes contaminating samples (Figure 3) can lower specificity. It can be carried out in house but is time consuming where rapid diagnosis is required. Other methods such as faecal flotation and faecal smears (Humm & Adamantos, 2010) are also possible to conduct in house with more rapid results, but also suffer from limited sensitivity. A new, point-of-care test, AngioDetect™ (angiodetect.co.uk, Idexx) has been developed for detecting circulating antigen in the blood. Reported sensitivity was 84.6% in detecting patent *A. vasorum* infection and specificity 100%.

This test allows for more rapid diagnosis in a clinical setting and also allows many dogs with clinical signs compatible with *A. vasorum* infection to be tested relatively economically and rapidly. This in turn allows a picture within practices to be built up as to whether *A. vasorum* is present in the local area. This picture needs to be constantly updated however, as the regional prevalence of *A. vasorum* can be very fluid.

**Control options other than chemoprophylaxis**

A number of control strategies for *A. vasorum* infection in dogs have been considered and are summarised in Table 1. All suffer from severe limitations and as a result chemoprophylaxis remains the mainstay of routine control measures.

**Chemoprophylaxis**

Use of a licensed monthly moxidectin or milbemycin oxime prophylactic preparation will prevent the risk of disease. *A. vasorum* has spread from endemic foci in the South and infected foxes and pet dogs have been found as far North as Scotland. Distribution of infection does not appear to be uniform with endemic foci now all over the country and this leads to the temptation to recommend universal use of a prophylactic. Young dogs and those eating slugs and snails are at higher risk, and in these dogs monthly prophylaxis should be considered. Also, in areas known to be endemic foci, then prophylaxis should be seen as routine, especially prior to surgery. In areas where endemic status is less certain then testing of dogs prior to surgery and suspected cases will rapidly build up a picture of whether *A. vasorum* is endemic in an area and whether routine prophylaxis for dogs is required. This data accumulation is vital if risk based advice is going to be given. This, and an assessment of risk for individual dogs, will form the basis of decision making as to whether to use prophylactic anthelmintics against *A. vasorum*. 

**Table 1: Control options other than chemoprophylaxis**

<table>
<thead>
<tr>
<th>Method</th>
<th>Limitations</th>
</tr>
</thead>
<tbody>
<tr>
<td>Eradication</td>
<td>Impractical due to intermediate host and wildlife reservoir. Use of molluscicides may increase risk of exposure due to exposure to dead slugs and snails</td>
</tr>
<tr>
<td>Reduction of exposure to intermediate host</td>
<td>Difficult due to ubiquitous nature of gastropod intermediate hosts. Some slugs on grass are very small</td>
</tr>
<tr>
<td>Use of nematophagous fungi</td>
<td>Predare L1 larvae but are currently not commercially available</td>
</tr>
<tr>
<td>Picking up dog faeces</td>
<td>Important and may have local impact but of limited use in <em>A. vasorum</em> control due to wildlife reservoir</td>
</tr>
</tbody>
</table>

**Summary**

Figure 1: Summary of the life cycle of *A. vasorum* (courtesy Bayer)

Figure 2: *Crenosoma vulpis*

Figure 3: Free living nematode in faecal sample

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