Does the zoonotic risk of *Toxocara* in Ontario justify deworming dogs & cats 12 times a year?

Andrew S. Peregrine, BVMS, PhD, DVM, DipEVPC

Jason Brophy, MD, DTM, FRCP(C)
Dogs & cats > 6 months:

“Administer year-round treatment with broad-spectrum heartworm anthelmintics that have activity against parasites with zoonotic potential.”

(CAPC 2008)
Toxocara canis - dogs
Toxocara cati - cats

- most common roundworms of dogs and cats
- both have zoonotic potential
- patent infections in all ages, particularly juveniles

Kazacos, 1983
Toxocara canis - dogs
Toxocara cati - cats

• most common roundworms of dogs and cats
• both have zoonotic potential
• patent infections in all ages, particularly juveniles
**Toxocara canis**

How common is infection in Ontario?

<table>
<thead>
<tr>
<th>Dogs</th>
<th>Number of samples</th>
<th>% (n) positive*</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>Hospital visitation dogs</td>
<td>102</td>
<td>2% (2)</td>
<td>Lefebvre et al 2006</td>
</tr>
<tr>
<td>AHL submissions</td>
<td>1110</td>
<td>4.0% (44)</td>
<td>McEwen 2008</td>
</tr>
<tr>
<td>Niagara practice</td>
<td>70</td>
<td>14% (10)</td>
<td>Shukla et al 2006</td>
</tr>
<tr>
<td>Ontario/Quebec shelters</td>
<td>49</td>
<td>6% (3)</td>
<td>Blagburn et al 2008</td>
</tr>
</tbody>
</table>

*samples analysed using centrifugal flotation
## Toxocara cati

**How common is infection in Ontario?**

<table>
<thead>
<tr>
<th>Cats</th>
<th>Number of samples</th>
<th>% (n) positive*</th>
<th>Reference</th>
</tr>
</thead>
<tbody>
<tr>
<td>AHL submissions</td>
<td>360</td>
<td>4.7% (17)</td>
<td>McEwen 2008</td>
</tr>
<tr>
<td>Niagara practice</td>
<td>41</td>
<td>12% (5)</td>
<td>Shukla et al 2006</td>
</tr>
<tr>
<td>Ontario/Quebec shelters</td>
<td>47</td>
<td>11% (5)</td>
<td>Blagburn et al 2008</td>
</tr>
</tbody>
</table>

*samples analysed using centrifugal flotation*
Toxocara in Humans

- Clinical disease:
  - Results from human exposure to environmental embryonated eggs
    - Ingestion of eggs
    - Hatching of larvae
    - Pathology due to larval migration through tissues
      - Visceral larva migrans (VLM)
      - Ocular larva migrans (OLM)

(image: Despommier 2008 (Despommier 2003))
Zoonotic risk in Ontario vs USA?

USA:

- *Toxocara* cases = 10,000 / year
- population = 280,563,000 (2002)

If same risk in Ontario as USA:

- # cases in Ontario = 450 / year
Toxocara in Humans

Visceral larva migrans (toxocariasis) in Toronto

M. Fanning,* MD; A. Hill,† MD, FRCP(C); H.M. Langer,‡ MD, FRCP(C);
J.S. Keystone,* MD, MSc (CTM), FRCP(C)

– 27-year review of toxocariasis at SickKids (Fanning, 1981) found only 18 cases of visceral and 3 possible cases of ocular disease:

In view of the small number of cases found in 27 years at this large pediatric hospital with a broad referral base, it is concluded that visceral larva migrans poses little risk to the health of children in the Toronto area.

– 2008/2009 - Poll of pediatric ID & ophthalmologists in Toronto/Ottawa – no cases seen in Toronto, 2 in Ottawa, in last 10 years

(Fanning, 1981; personal communication)
Toxocara in Humans

Seroprevalence in Ontario:

• In past decade, 2052 serum samples in ON submitted for Toxocara serology:
  – all testing in ON done by central provincial public health laboratory
  - 205 / 2052 (~10%) samples = seropositive
  - >80% of positive samples were low-level positive (ie. titres of 1:100 – 1:400) – suggestive of either past infection or false positive

Source: T Mazzulli CPHL
Toxocara in Humans

Seroprevalence in Ontario:

- 33/205 over last 10 years were high titres suggestive of acute *Toxocara* infection (3.3/year).
- Little data on patients – symptoms; some were repeat samples from same patient, some confirmed to be travel-related.
- While these data represent only cases where sample was sent for testing, suggests that *Toxocara* is a very rare infection in Ontario.

Source: T Mazzulli CPHL
Summary

- *Toxocara canis/cati*:
  - Canadian epidemiology appears different from USA
    - appears to be a rare diagnosis in people in Ontario, possibly relating to:
      - environment (winter)
      - hygienic differences (pooper scoopers)?
      - current pet deworming practices?
Deworming 12 times a year?

Canadian paediatric infectious disease, travel medicine and public health experts do not believe it is justifiable.

- Not considered a significant issue by CIHR
- Still being endorsed in Ontario because of the zoonotic risk of *Toxocara*

What would help?

Consensus statement on issue from Ontario public health community
Acknowledgements

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