Pinworm – a growing irritation

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NICOLA MENZIES-GOW MA, VetMB, PhD, DipECEIM, CertEM(IntMed), FHEA, MRCVS explains the origination, clinical signs and effects of this gastrointestinal parasite on horses, as well as suitable management and prevention methods

Summary

Oxyuris equi, also known as the pinworm, is a gastrointestinal parasite of adult horses associated with perianal pruritus, caused by the adult female laying eggs in sticky clumps around the anus. A definitive diagnosis is made based on the clinical signs and results of a transparent adhesive cellulose tape test. In most cases, it is prevented and controlled by routine anthelminthic treatment using benzimidazoles, dihydropyrimidines or macrocyclic lactones. However, evidence suggests treatment failure in association with macrocyclic lactone use in a few cases. If continuous shedding of *O equi* eggs occurs, despite appropriate treatment with ivermectin or moxidectin, a compound from a different chemical class, such as the benzimidazoles or dihydropyrimidines, should be used as an alternative.

Key words

Oxyuris equi, **pinworm**, **resistance**, **pruritus**

***OXYURIS equi*, also known as the pinworm, is an equine gastrointestinal parasite often described as a parasite of low pathogenicity and thus, of minor importance.**

It is of interest to horse owners because of the irritation caused by the female worms gluing eggs

on to the perianal region of the horse, which can result in rubbing and damage to the tail and perianal skin. Clinically, it can be confused with insect bite hypersensitivity.

Life cycle

O equi follows a direct life cycle, with the adults inhabiting mainly the right dorsal colon and, in cases of heavy infections, also the adjoining parts of the colon of equines. After mating, adult females (Figure 1) migrate to the anus to deposit eggs in sticky clumps (8,000 eggs/female to 60,000 eggs/female) seen grossly as yellowish white gelatinous streaks on the skin of the perianal region.

Within four to five days, the egg contains an infective third-stage (L_3) larva. The eggs are rubbed off, contaminate the environment and horses become infected by ingestion of eggs on forage, grass and bedding. The eggs hatch and the L_3 larvae invade the crypts of Lieberkühn in the ventral colon and caecum.

Within three days to 11 days, development into fourth-stage (L_4) larvae takes place and the L_4 larvae move slowly towards the dorsal colon. From day 50, post-infection moulting into fifth-stage (L_5) larvae begins and it will take another 100 days to reach sexual maturity.

Pathogenic effects and clinical signs

Most of the pathogenic effects of *O equi* in the intestine are due to the feeding habits of the larval stages – mainly of L_4 – within the mucosal crypts, which result in small erosions of the mucosa and, in heavy infections, these may be widespread and accompanied by an inflammatory response.

In some cases of equine oxyuriasis, affected animals are reported to show a decrease in general condition, fatigue, reduced performance and poor hair coat quality, which could possibly be associated with gastrointestinal inflammation[1].

However, infections generally are recognised by horse owners due to the pruritus caused by the semi-liquid eggs desiccating, which can result in scratching and damage to the tail and perianal skin (Figure 2). The main differential diagnosis for the pruritus is insect bite hypersensitivity (sweet itch).

Diagnosis

As the eggs are laid outside the rectum, it is possible faecal egg counts will fail to detect the presence of *O equi*.

Instead, a diagnosis is made based on the results of a transparent adhesive cellulose tape test, in which a strip of tape is applied to the skin close to the rectum, removed and then examined under a

microscope for the presence of *O equi* eggs.

Prevention and control

O equi has been reported to be sensitive to a broad range of anthelmintics, including benzimidazoles, dihydropyrimidines and macrocyclic lactones.

Studies report pyrantel, ivermectin and moxidectin are 91 per cent to 100 per cent effective against adult worms and 95 per cent to 99 per cent effective against the larval stages[2]–[4].

Thus, traditionally, it has been thought pinworms are easily prevented by the anthelminthic protocols routinely employed for the control and prevention of large and small strongyles and cestodes.

However, it must be acknowledged that testing the effect of these compounds on *O equi* was a side effect rather than the main goal of many of the studies and that, in one study, small numbers of pinworms were found in three out of four horses after ivermectin treatment and removal of L_3 larvae was only 37 per cent[5].

Anecdotal reports of treatment failures using ivermectin and moxidectin have been published[4], [6], [7], as well as documented cases from the US, New Zealand and Germany[1], [8], [9], in which continuous shedding of *O equi* eggs – despite repeated treatments with either ivermectin or/and moxidectin compounds – occurred, resulting in severe perianal pruritus as the main clinical finding.

Instead, treatment with pyrantel, oxfendazole (used under the cascade) or mebendazole, respectively, led to expulsion of adult worms or cessation of *O equi* egg shedding[1], [8], [9]. A surprising finding in these documented cases was some horses seemed completely unaffected and free from pinworm infection, despite sharing the same stable and paddock as the infected animals and, therefore, the same egg-contaminated environment. The authors could not give a plausible explanation for this phenomenon, but suggested the individual immune status may have most probably played a role[1].

These reports should be interpreted with caution as, while ivermectin or moxidectin treatment may not have been fully effective in these cases, this does not comprise unequivocal evidence of anthelmintic resistance as none of the marketed anthelmintic compounds are recognised by their respective regulatory agencies as being consistently 100 per cent effective against adult *O equi*[1].

Instead, it could confirm an existing, but overlooked, incomplete oxyuricidal efficacy of these compounds[1]. It should also be noted perianal pruritus or tail rubbing is not definitive evidence of *O equi* infection and owners may consider continued tail rubbing after anthelmintic treatment to be definitive evidence of treatment failure.

Thus, care should be taken when interpreting owner reported cases of persistent tail rubbing, despite treatment with macrocyclic lactones. Further studies are needed to clarify whether drug resistance is emerging.

Moxidectin, ivermectin, fenbendazole, mebendazole and pyrantel have a UK licence against both the adult and larval stages of *O equi*. Thus, if a pinworm infection persists after a repeated treatment with macrocyclic lactones, a compound from a different chemical class, such as the benzimidazoles or dihydropyrimidines, should be used as an alternative.

References

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Figure 1. Adult female *Oxyuris equi*.

IMAGE: Mark Fox, RVC.

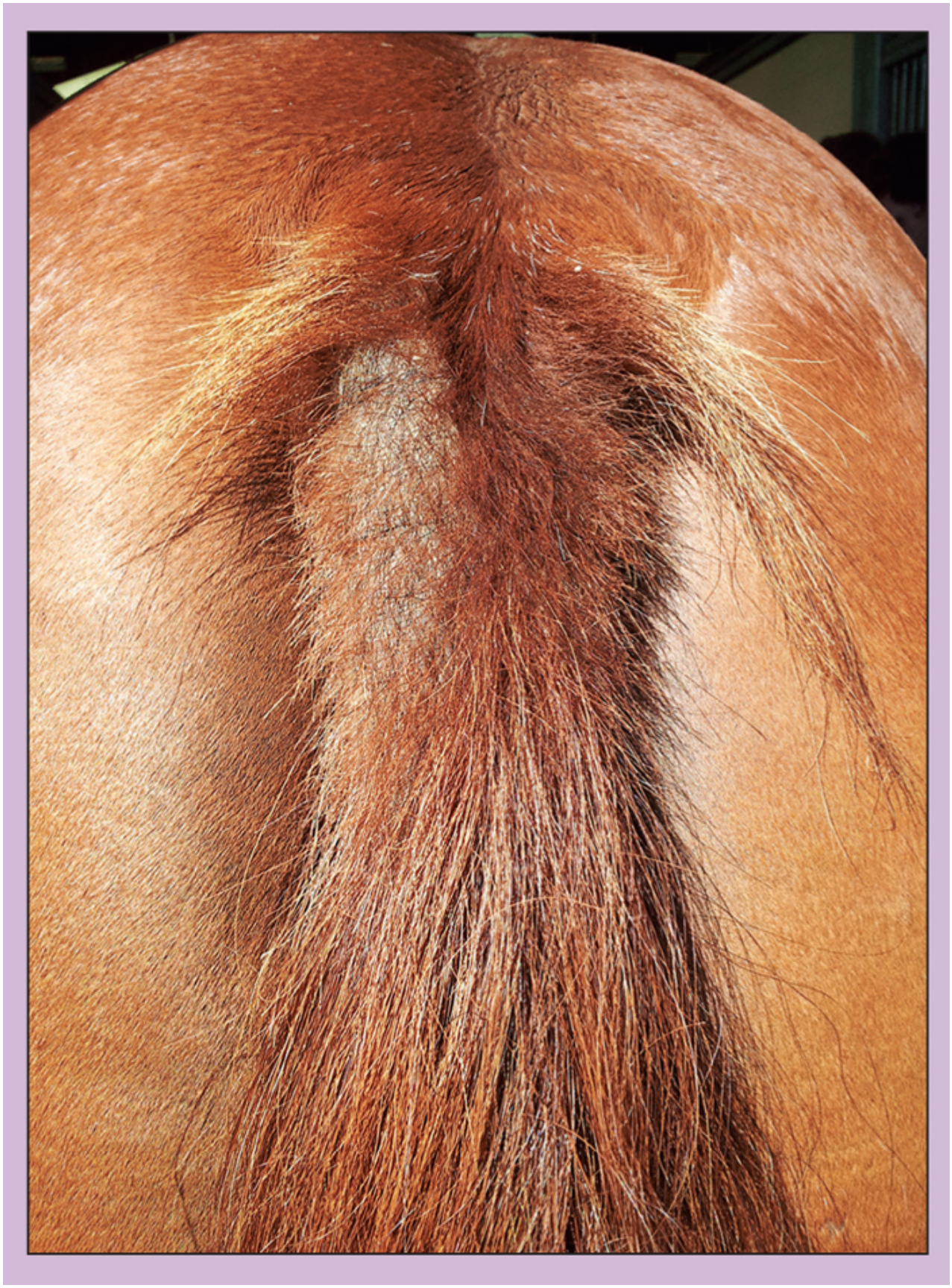

Figure 2. A 12-year-old Thoroughbred mare with perianal pruritus.