

### „Egg Reappearance Period“ von *Anoplocephala* nach Praziquantel-Gabe

In Foren und Expertenrunden zur Selektiven Entwurmung wird häufig von einer „Egg Reappearance Period“ (ERP) von 6 Monaten von *Anoplocephala* spp. nach Praziquantel-Gabe gesprochen. Die ERP ist der Zeitraum nach einer Behandlung, in dem keine Eier im Kot nachgewiesen werden können bis zum „Wiedererscheinen“ der Eier.

Der Ursprung dieser Aussage ist wohl ein Zitat auf der Seite CliniPharm der Universität Zürich zu den Dosierungen von Praziquantel (Siehe: [http://www.vetpharm.uzh.ch/WIR/00005526/8741\\_F.htm](http://www.vetpharm.uzh.ch/WIR/00005526/8741_F.htm), Abb. 1).

Pferd, Pony - Praziquantel	
oral	<ul style="list-style-type: none"> <li>- 2,5 mg/kg (<a href="#">Grubbs 2003</a>)</li> <li>- 1,5 mg/kg; in Kombination mit 0,2 mg/kg <a href="#">Ivermectin</a> (<a href="#">Barrett 2004</a>; <a href="#">Coles 2003</a>)</li> <li>- 1 mg/kg (<a href="#">Rehbein 2003</a>)</li> <li>- 1 mg/kg (<a href="#">Lyons 1992b</a>; <a href="#">Proudman 1995</a>), <b>Der Kot behandelter Tiere bleibt für mindestens 6 Monate frei von Cestodeneiern (<a href="#">Proudman 1995</a>).</b></li> <li>- 0,5 mg/kg (<a href="#">Lyons 1995</a>)</li> <li>- Die Injektionslösung (z.B. Droncit®) kann per Magensonde oder intraoral verabreicht werden (<a href="#">Proudman 1995</a>)</li> </ul>

Abb. 1. Dosierungen Praziquantel beim Pferd, aus: [http://www.vetpharm.uzh.ch/WIR/00005526/8741\\_F.htm](http://www.vetpharm.uzh.ch/WIR/00005526/8741_F.htm))

Dieses Zitat bezieht sich auf den Fachartikel von C.J. Proudman von 1995 (Proudman CJ, Swan JD & Trees AJ, 1995, Efficacy of pyrantel emboate and praziquantel against the equine tapeworm *Anoplocephaloides mamillana*. Vet Rec 137: 45-46). Prof. Chris Proudman ist inzwischen ein international angesehener Forscher, der unter anderem einige Forschungsarbeiten zum Bandwurmbefall veröffentlicht hat. Diesen sehr frühen Artikel listet er allerdings nicht auf seiner Internetseite auf. Dort steht tatsächlich, wie zitiert, dass der Kot der in der Studie untersuchten Pferde für 6 Monate frei von Bandwurmsegmenten blieb (Abb. 2).

egg count pre and post treatment with pyrantel and following treatment with praziquantel. The owners of all three horses reported the disappearance of parasite segments from their horse's faeces, following an initial increase one to three days after praziquantel treatment; faeces of all the horses remained free of parasite segments for at least six months after praziquantel treatment. Nine months after treatment, horse A was seen to be passing parasite segments in faeces and *A. mamillana* eggs were identified by centrifugation/flotation. None of the horses suffered any untoward side-effects following the administration of praziquantel.

Abb. 2 Ausschnitt aus dem Artikel von Proudman et al. (1995) zu den Beobachtungen nach der Entwurmung

Liest man den Artikel genauer, dann fallen allerdings einige Punkte auf, die klar machen, dass man dies nicht mit einer allgemein gültigen ERP von 6 Monaten bei *Anoplocephala* gleichsetzen darf.

1. Die untersuchten Pferde waren mit *Anoplocephaloides mamillana* (heute meist: *Paranoplocephala mamillana*) befallen. Eine Übertragung der Ergebnisse auf *A. perfoliata* ist nicht direkt möglich.
2. Es wurden nur 3 Pferde untersucht. Die Ergebnisse sind demnach nicht repräsentativ.
3. Das verwendete Präparat und die Eingabemethode entsprechen nicht den normalen, heutigen Verfahren. Die Dosierung ist allerdings gleichgeblieben (Abb. 3).

w/w) was administered orally at a dose rate of 38 mg/kg bodyweight; praziquantel, (Droncit injectable 56.8 mg/ml) was administered by stomach tube, at a dose rate of 1 mg/kg bodyweight, and washed down the tube with approximately 200 ml of water.

Abb. 3: Ausschnitt aus dem Artikel von Proudman et al. (1995) zur Dosierung von Praziquantel

- Die Eiausscheidung wurde nur bis Tag 14 nach Behandlung mit Praziquantel (Tag 34 nach Studienbeginn) mittels Kotprobe überprüft. Die weiteren Beobachtungen wurden durch die Pferdebesitzer gemacht. Eine genaue Aussage über den Start der Eiausscheidung kann also nicht getroffen werden.
- Im Artikel wird nichts zum Zeitpunkt der Entwurmung oder zum Weidegang der Pferde berichtet. Es ist also durchaus möglich, dass erst einige Zeit nach der Entwurmung eine erneute Ansteckung mit *P. mamillana* möglich war (Winter, kein Weidegang).

Laut der veröffentlichten Daten zur Pharmakokinetik zeigt Praziquantel keine Residualwirkung (siehe: [http://www.vetpharm.uzh.ch/WIR/00005526/8741\\_F.htm](http://www.vetpharm.uzh.ch/WIR/00005526/8741_F.htm)). Die Präpatenz von Anoplocephaliden wird mit 6-10 Wochen angegeben (Eckert et. al., 2008, Lehrbuch der Parasitologie für die Tiermedizin). Es erscheint deshalb unwahrscheinlich, dass die ERP 6 Monaten beträgt.

Eine Behandlung der Pferde im Winter kann aber die Eiausscheidung für mehrere Monate unterbrechen, sofern die Neuinfektion erst beim Weidegang im Frühjahr stattfindet. Der Zeitpunkt der letzten Behandlung, sowie die früheste Möglichkeit einer Neuinfektion sollten daher bei der Wahl des Zeitpunkts einer gezielten Untersuchung auf Bandwurmbefall beziehungsweise des nächsten Behandlungstermins miteinbezogen werden.

## Efficacy of pyrantel embonate and praziquantel against the equine tapeworm *Anoplocephaloides mamillana*

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THERE are few publications on the equine tapeworm *Anoplocephaloides mamillana* (formerly *Paranoplocephala mamillana*) and most concern its taxonomy (Soulsby 1968, Rausch 1976). *A. mamillana* is smaller than *Anoplocephala perfoliata*, a mature adult measuring only 0.6 to 5.0 cm in length. Adults live in the equine small intestine and have a life cycle similar to *A. perfoliata*, involving oribatid mites as intermediate hosts.

Diagnosis of infection is by coprological examination for characteristic eggs. The only validated method of diagnosing equine cestodiasis is that of faecal centrifugation/flotation which is relatively insensitive in detecting *A. perfoliata* eggs (Proudman and Edwards 1992). Standard flotation techniques for strongyle eggs will rarely demonstrate cestode eggs. Differentiation between the different genera of the equine Anoplocephalidae is possible by the morphological and morphometric features of the eggs identified. A further aid to diagnosis is the recognition of gravid proglottids on the surface of freshly voided faeces. The appearance of barrel-shaped proglottids is invariably associated with *A. mamillana* infection (authors' observation).

Infection with *A. perfoliata*, thought to be the most common cestode of the horse (French and Chapman 1992), is usually treated with pyrantel embonate (or tartrate) at twice the nematocidal dose. Efficacy studies have demonstrated that such treatment is 93 per cent effective in removing *A. perfoliata* (Lyons and others 1986), but efficacy against *A. mamillana* has not been reported. The only drug with reported efficacy against *A. mamillana* is bithionol (Soulsby 1968). Infection with *A. mamillana* is rarely associated with clinical disease, but the presence of proglottids in the faeces is easily noticed by owners and hence treatment is sought.

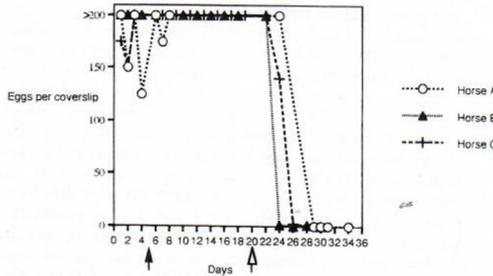
The present study used three horses with *A. mamillana* infection to evaluate, by faecal egg count reduction, the efficacy of pyrantel embonate (Strongid-P paste; Pfizer) at a dose rate of 38 mg/kg, and praziquantel (Droncit injectable; Bayer) at a dose rate of 1 mg/kg.

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**TABLE 1: Protocol for efficacy trial of pyrantel embonate and praziquantel against *A. mamillana***

Day number	Action
1-4	Faeces sample daily
5	Administer pyrantel embonate
6-18	Faeces sample every second day
20	Administer praziquantel by stomach tube
22-34	Faeces sample every second day



**FIG 1: Graph showing the change in *A. mamillana* egg output in faeces of three infected horses following treatment with pyrantel embonate (†) and praziquantel (‡)**

Horse A was a seven-year-old hunter gelding whose faeces included small, barrel-shaped parasite segments. The horse was treated with Strongid-P at a dose of 38 mg/kg bodyweight and six weeks later with ivermectin at a dose of 200 µg/kg bodyweight (Ivomec infection; MSD Agvet). Neither treatment resulted in a change in the rate of output of parasite segments on the faeces. A further course of pyrantel administered daily for four consecutive days at a dose rate of 38 mg/kg was similarly ineffective. The horse was in good bodily condition and suffered from no symptoms of gastrointestinal disease.

Horse B was an eight-year-old cob gelding used for general riding purposes. It was in good bodily condition, with no signs of gastrointestinal disease other than the presence of parasite segments in the faeces. The owner was concerned that the segments remained in the faeces after treatment with pyrantel (38 mg/kg bodyweight) and their presence had caused the horse to be expelled from a livery yard.

Horse C was an 18-year-old cob gelding retired from use as a riding horse. It was in moderate bodily condition although the owner felt that it had begun to lose weight. The presenting problem was that of parasite segments in the faeces, a situation which had not been altered by the use of cestocidal doses of pyrantel.

Faeces from each horse were submitted for diagnostic purposes and examined for helminth eggs using saturated salt solution and a McMaster counting chamber. Centrifugation/flotation with a saturated sugar solution was also performed for the flotation of cestode eggs (Proudman and Edwards 1992). Initial diagnosis of *A. mamillana* was aided by the measurement of egg diameter and length using a calibrated eye-piece. Although the technique of centrifugation/flotation is essentially qualitative, it was made semi-quantitative by counting the number of cestode eggs observed under each of the two coverslips prepared from a similar volume of faeces. Counting stopped at 200 eggs/coverslip. An attempt at quantitation enabled any partial reduction in this number to be assessed after treatment.

Following a definite diagnosis of *A. mamillana* cestodiasis, a standard protocol for sample collection and treatment was instituted (Table 1). Pyrantel embonate (Strongid-P paste 43.9 per cent w/w) was administered orally at a dose rate of 38 mg/kg bodyweight; praziquantel, (Droncit injectable 56.8 mg/ml) was administered by stomach tube, at a dose rate of 1 mg/kg bodyweight, and washed down the tube with approximately 200 ml of water.

At the time of initial diagnosis, horses A and C had in excess of 200 and horse B had an average of 30 *A. mamillana* eggs/coverslip

in the faeces examined. Horse C had 200 strongyle eggs/gram faeces, horses A and B had none. Fig 1 shows the *A. mamillana* faecal egg count pre- and post treatment with pyrantel and following treatment with praziquantel. The owners of all three horses reported the disappearance of parasite segments from their horse's faeces, following an initial increase one to three days after praziquantel treatment; faeces of all the horses remained free of parasite segments for at least six months after praziquantel treatment. Nine months after treatment, horse A was seen to be passing parasite segments in faeces and *A. mamillana* eggs were identified by centrifugation/flotation. None of the horses suffered any untoward side-effects following the administration of praziquantel.

Praziquantel is not licensed for use in the horse. Lyons and others (1992) reported the use of the injectable formulation by stomach tube and intraorally. Both methods of administration were extremely efficacious against *A. perfoliata* resulting in the removal of 89 to 100 per cent of parasites. Toxicosis was not evident in any of the 19 horses treated.

Veterinary surgeons presented with horses passing barrel-shaped parasite segments in faeces should consider *A. mamillana* as the cause of the problem. The persistence of such segments following pyrantel therapy should not be interpreted as drug resistant *A. perfoliata*. Praziquantel therapy may be indicated in confirmed cases of *A. mamillana* cestodiasis.

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## First report of canine ehrlichiosis in Costa Rica

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CANINE ehrlichiosis is a complex infectious disease caused by the rickettsial organism *Ehrlichia canis*, which invades circulating leucocytes not only of canids but also man (Eng and Giles 1989). This microorganism is very pleomorphic and resides intracytoplasmatically, either singly in compact colonies or as inclusions (morulae).

The infection is transmitted by *Rhipicephalus sanguineus*, and possibly by other vectors such as *Ixodes dammini* and *Amblyomma americanum* (Magnarelli 1990).

In recent years, this laboratory has examined large numbers of dogs presented with clinical signs including pyrexia, anaemia, anorexia, epistaxis and thrombocytopenia. These signs were compatible with ehrlichiosis, although the disease had not previously been diagnosed in Costa Rica.

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