

Oral doramectin for the treatment and control of internal parasites in horses

Autores: Luis A. Chávez B.¹

¹ BVM, Research, Design and Innovation Assistant of Agrovvet Market Animal Health

Parasitic diseases are responsible for a significant morbidity and mortality worldwide and is frequently present with nonspecific signs and symptoms that often impedes the diagnosis (Gosling, 2005). Among the many animals that could be affected by parasites are horses, which are susceptible to several parasites throughout their lives, depending on the conditions of life and age (Brown, 2005).

Among the wide variety of parasites that can affect horses, we have the nematodes, which belong to phylum Nematelminthes. Nematodes are roundworms with ends that are pointed. Its body has no segmentations and its size is quite variable; is covered by a cuticle pearly white, which protects the parasite (Soulsby, 1987; Vignau et al, 2005). Females may be oviparous, viviparous or ovivíparous . The eggs may hatch both in the environment and in the host, depending on the species and some stimulating factors such as reducing agents, moisture and temperature. Nematodes always experience four molts during its development after hatching (larvae 1, larvae 2, larvae 3, larvae 4 and/or pre-adult). The adult parasites can be hosted in a variety of organs such as the eyes, mouth, tongue, stomach, intestine, liver, lungs, trachea and cavities (Anderson , 2000; Vignau et al, 2005) .

There are many species of nematodes that may affect the horses, among them we have gastrointestinal nematodes such as *Strongylus vulgaris*, *Strongylus edentatus*, *Strongylus equinum* *Triodontophorus spp.*, *Coronocylus spp.*, *Cyathostomum spp.*, *Cylicocyclus spp.*, *Cylicostephanus spp.*, *Cylicodontophurus spp.*, *Gyalocephalus spp.*, *Petrovinema spp.*, *Poteriostomum spp.*, *Parascaris equorum*, *Oxyuris equi*, *Trichostrongylus axei.*, *Strongylus westeri*, *Habronema muscae*, *Draschia spp.*, *Dyctiocaulus arnfieldi*, *Onchocerca spp* (Barriga, 2002; Foreyt, 2001; Kassai, 2002).

Among the proposed treatments for parasitic nematode infections exist many active ingredients, among these the doramectin is mentioned. Doramectin belongs to the family of macrocyclic lactones and it is a synthetic avermectin. Its structure has slight differences with ivermectin. (Sumano and Ocampo, 2006) doramectin. The recommended dose is 200 mg/kg and is highly effective against nematodes when it is applied orally.

The effect caused by the doramectin is the increase of permeability on chloride channels in the cell membrane of cells in the nervous system of the parasites, inhibiting electrical activity of nerve cells in the nematode. The neuronal receptors to which doramectin binds in mammals are located in the Central Nervous System and doramectin not have the ability to cross the blood-brain barrier, or at least can accumulate in such minimum quantities that do not affect its function. In addition to the explanation, mammals do not have glutamate-dependent channels chlorine, which classifies the avermectins, including doramectin, as a non-toxic drug to mammals (Plumb, 2002; Sumano and Ocampo, 2006).

Notably, when administration of doramectin is performed orally, longer residual period is achieved, with detectable levels in plasma up to 30 days. The elimination half-life of doramectin is 30% higher than the Ivermectin administered orally (Perez et al, 2002).

The effectiveness of doramectin by oral route in horses, has been demonstrated in several studies as shown below Tang and Ledesma (2006) demonstrated that the use of a flavored oral endectocide gel based on doramectin at 1.75% (w/w) (doraQuest LA ®) had 100% efficacy in the reduction of eggs type *Strongylus* in faeces, which indicates an antinematodic effectiveness of 100% at 7 days post treatment on jumping horses. Other study performed in the central highlands of Peru (Junín, 3244 m) demonstrated the antinematodic effectiveness of 100% at 7 days post treatment in horses using a gel based on oral doramectin to 1.75% (doraQuest ® LA) (Tang et al, 2008).

Casas and Chavez (2007) demonstrated that the oral application of a gel based on 1.75% doramectin (doraQuest LA ®) is highly effective against nematodes of the gender strongylus in horses until day 63, maintaining its effective capacity until day 70 post treatment. The effectiveness is found superior than the one of other studies using only fenbendazole in horses, which reported efficiencies ranging from 84.4 to 99.4% over the reduction of eggs type Strongylus, between 10 and 14 days post dosage (Varady et al., 2004).

Considering its pharmacokinetics, tolerance and anthelmintic efficacy, oral administration of doramectin is a great alternative to conventional antiparasitic treatment and control of parasitic diseases in horses.

Bibliography

- Anderson** RC. 2000. Nematode Parasites of Vertebrates: Their Development and Transmission. 2° edition. CABI Publishing. Department of Zoology, University of Guelph, Guelph, Ontario, Canada. **Barriga** O. 2002. Las Enfermedades Parasitarias de los Animales Domésticos en la América Latina. Editorial Germinal. **Casas** E, Chávez A. 2007. Evaluación de la efectividad de un antiparasitario oral en base a doramectina (doraQuest La®) para el control de nematodos gastrointestinales en equinos. **Castaño** R. 2005. Parásitos de los equinos. Red de Helminología para América Latina y el Caribe. Conferencia Electrónica 2005. Área de Parasitología, Instituto de Patobiología, CICVyA-INTA. CC 25 -CP 1712, Castelar, Argentina. **Foreyt** WJ. 2001. Veterinary Parasitology: Reference Manual. 5° Edition. Iowa State University Press. **Kassai** T. 2002. Helminología Veterinaria. 1° Edición. Editorial Acribia. **Perez** R, Cabezas I, Godoy C, Rubilar L, Muñoz L, Arboix M, Castells G, Alvinerie M. 2002. Pharmacokinetics of doramectin and ivermectin after oral administration in horses. Veterinary Journal (2002) Volume 163, Pages 161-167 **Plumb** DC. 2002. Veterinary drug handbook. 4° edition. Iowa State Press. Blackwell Publishing Company. PharmaVet Publishing, White Bear Lake, Minnesota, USA. **Soulsby** EJJ. 1987. Parasitología y enfermedades parasitarias en los animales domésticos. 7ma Edición. Editorial Interamericana. México DF, México **Sumano** HS, Ocampo L. 2006. Farmacología Veterinaria. MacGraw-Hill Interamericana. 3° Edición. **Tang** J, Ledesma V. 2006. Evaluación de Tolerancia y Eficacia de un Endectocida en Gel sobre la base de Doramectina (doraQuest L.a.) en el tratamiento de parasitosis internas de caballos de salto. **Tang** J, Ruiz F, Rodriguez L. 2008. Evaluación de Tolerancia y Eficacia inmediata de un Endectocida en Gel sobre la base de Doramectina al 1.75% (doraQuest L.a.) en el tratamiento y control de parasitosis internas en equinos de la sierra central. **Vignau** ML, Venturini LM, Romero JR, Eiras DF, Basso WU. 2005. Parasitología práctica y modelos de enfermedades parasitarias en los animales domésticos. 1° Edición. Facultad de Ciencias Veterinarias. Universidad Nacional de La Plata. Argentina.