Journal of Equine Veterinary Science 32 (2012) 274-280

Journal of Equine Veterinary Science

journal homepage: www.j-evs.com

Original Research

Preliminary Analysis of the Results of Selective Therapy Against Strongyles in Pasturing Horses

Ruben Francisco DVM [a], Adolfo Paz-Silva DVM, PhD, DipEVPC [a], Iván Francisco DVM, PhD [a], Francisco Javier Cortiñas DVM [a], Silvia Miguélez DVM [a], José Suárez DVM [a], Cristiana Filipa Cazapal-Monteiro DVM [a], José Luis Suárez DVM, PhD [b], María Sol Arias DVM, PhD [a], Rita Sánchez-Andrade PhD [a]

[a] *Equine Diseases Study Group (Epidemiology, Parasitology, and Zoonoses), Animal Pathology Department, Veterinary Faculty, Santiago de Compostela University, Campus Universitario, 27002-Lugo, Spain*

[b] *Instituto Lucense para el Desarrollo Económico y Social (INLUDES), Diputación Provincial de Lugo, 27002-Lugo, Spain*

A R T I C L E I N F O

Article history:
Received 1 July 2011
Received in revised form
15 September 2011
Accepted 27 September 2011
Available online 14 December 2011

Keywords:
Horse
Parasite Control
Selective Therapy
Macrocyclic Lactones
Rotation Grazing

A B S T R A C T

Control of horse parasites often omits application of measures to eradicate the free-living stages in pastures and frequently relies on chemotherapy only. Selective therapy was used for Spanish Sport horses grazing either in the same pasture (continuous) or in rotated meadows. In each group, equines exceeding a cutoff value of 300 strongyle eggs per gram of feces received ivermectin or moxidectin. Efficacy of the treatment was assessed by estimating reduction of fecal egg counts and the number of horses shedding parasite eggs (PHR). Coprocultures revealed presence of the cyathostomins *Cyathostomum* and *Gyalocephalus* spp. In all treated groups, a 100% value for both reduction of fecal egg counts and PHR against cyathostomins was obtained, and PHR values ranged from 100% to 12%. The longest strongyle egg reappearance period was observed in horses undergoing rotation grazing and receiving ivermectin (9 weeks), compared with a 6-week period recorded for the other treated equines. Our results seem to point that the efficacy of selective therapy in equine herds could be reduced if the horses with fecal egg counts below the threshold value (thus not receiving chemotherapy) remain grazing in the same pastures with the treated ones. It is strongly suggested that interested parties consider performing periodic fecal analyses to monitor fecal egg counts, together with the percentage of horses passing eggs in feces, to improve the effect of this procedure.

1. Introduction

Among the parasites infecting horses maintained in pastures, ascarids, strongyles, oxyurids, and cestoda are frequently detected, whereas protozoa or trematoda are rarely found in the feces of these animals [1-3]. Chemotherapy comprises the main procedure for control of these parasites, and several efficient drugs (chiefly benzimidazoles, macrocyclic lactones, and tetrahydropyrimidines) are commercially available.

Macrocyclic lactones are the most frequently applied dewormers against cyathostomins [4]. While ivermectin has been reported to have little or no efficacy against encysted larvae and developing larvae at the recommended dose, several studies have shown the efficacy of moxidectin against encysted larvae at the indicated dose, together with the longest period of fecal egg suppression [5-7].

Regardless of the availability of efficient parasiticides, several aspects associated with deworming of horses can reduce the expected success of treatment. Absence of a periodical analysis to check the parasitological status of the

The final article has been approved by all authors. This research is in accordance with the current laws for Animal Health Research in Spain.

Corresponding author at: Adolfo Paz-Silva, DVM, PhD, DipEVPC, Department of Animal Pathology, Faculty of Veterinary, University of Santiago de Compostela, Campus Universitario, s/n 27002 Lugo, Spain.
E-mail address: adolfo.paz@usc.es (A. Paz-Silva).

0737-0806/$ - see front matter © 2012 Elsevier Inc. All rights reserved.
doi:10.1016/j.jevs.2011.09.074

equines before or after chemotherapy to assess the effect of treatment has been indicated as a frequent and important difficulty in the treatment of parasites [8]. In many cases, treatment is applied only to the most valuable horse specimens or when visual examination of the horses seems to reveal a very poor body condition. Another consideration is accurate estimation of the body weight to calculate the proper dose [9] or deworming of wild horses [10].

In the past few decades, increasing resistance of parasites (ascarids and strongylids) to different groups of anthelmintics, such as the benzimidazoles, pyrantel salts, or the macrocyclic lactones, has been noted [11-14], as indicated by both reduced activity of the drug and a shorter cyathostomin egg reappearance period (ERP) [15,16].

Using different classes of anthelmintics in a fast rotation scheme (e.g., every few months) or a slow rotation scheme (annually) is widely practiced to prevent development of resistant parasite strains; however, there is little evidence to support the utility of this procedure.

Selective therapy is generally recommended on the basis of deworming the horses that exceed a predetermined cutoff fecal egg count (FEC) [9,17-19]. Treating only adult horses has been proposed when there is a large variation in FECs within a herd. Treatment is recommended for young horses, as they excrete a larger number of eggs and are challenged much faster after treatment [20]. Studies reporting success with selective therapy were performed in adult horses [21].

The requirement to reduce the level of pasture contamination with free-living stages has been widely indicated to ensure successful control of a number of parasites, especially the cyathostomins [22,23]. Although several procedures have been described, with a focus on rotational grazing, pasture clipping, chain harrowing, manual extraction of fecal pats, or administration of chlamydospores of the nematode-trapping fungus *Duddingtonia flagrans* [24-27], their application is not very widespread.

Herein the influence of selective therapy on the success of pasture rotation to enhance the control of cyathostomins in grazing horses is analyzed.

2. Materials and Methods

2.1. Area of Study and Horse Management

The current investigation was carried out in Galicia (Northwest Spain, 42°20′−43°45′N, 6°49′−8°00′W), an agricultural region. Pastures are usually composed of *Trifolium pratense*, *T repens*, *Lolium perenne*, *L multiflorum*, and *Dactylis glomerata*.

Because climatic conditions favor development of grass throughout February to December, grazing equines remain outdoors unless adverse weather conditions prevent them. At these times, they are kept in boxes.

Parasite control is performed by the annual administration (in spring) of anthelmintics, with macrocyclic lactones or benzimidazoles being the foremost choice. Coprological analyses are seldom considered [28].

2.2. Experimental Design

In May 2010, efficacy of chemotherapy based on the administration of moxidectin (0.4 mg/kg body weight 2% oral gel, Equest, Fort Dodge, Madrid, Spain) or ivermectin (0.2 mg/kg body weight oral gel, Eqvalan, Merial, Madrid, Spain) was assessed on 50 adult Spanish Sport mares (4-8 years) grazing in two pastures of 25 hectares. These pastures were localized at two different places in Galicia (Northwest Spain). According to the criteria defined for selective therapy against cyathostomins, treatment was applied to horses passing ≥300 eggs per gram of feces (EPG) [29]; equines with EPG below this cutoff value remained in control groups.

(a) Continuous grazing: the horses were fed in a 25-hectare pasture and received a supplement of wheat straw and barley when needed. Water was supplied ad libitum.

C/Eqt: 10 mares treated with moxidectin.
C/Eql: eight mares received ivermectin.
C/C: seven mares remained untreated as controls.

(b) Rotation grazing: horses were maintained on 20-25-hectare pastures and were moved to clean meadows every 2-3 months, when the herbage begins to be scarce. Wheat straw and barley were supplied approximately every 7 days. Water was available ad libitum. These horses were used to keep the meadows free and clean of shrubs and to control the grass. This group of work horses was dewormed 1 week before being moved to other pastures, with the aim to avoid larvae and/or adult parasites being passed by feces and thus preventing the contamination of the grasslands.

R/Eqt: 10 mares treated with moxidectin.
R/Eql: eight mares received ivermectin.
R/C: seven mares remained untreated as controls.

In the present investigation, adequate measures were taken to address the welfare of the horses involved. All experiments were carried out in accordance with the permission of and adequate monitoring by the committee of the Santiago de Compostela University (Spain). All experiments also comply with the Spanish legal framework.

2.3. Fecal Analysis

In all cases, feces were collected individually from the rectum of each mare. The technician, who was blinded to treatment protocols, processed 5 g of each fecal sample by performing a McMaster modified technique with a minimum detection level of 10 EPG [3]. Data shown in the current study are expressed as numbers of EPG.

Identification of the strongyles was performed after the feces were cultured at 25°C for 15 days [28].

2.4. Efficacy of Chemotherapy

Fecal samples were collected 1 week before the deworming and 2 weeks (14 days) after treatment. Efficacy of the macrocyclic lactones was evaluated by using copromicroscopical analysis to estimate the reduction in the fecal egg count (FECR) and in the number of positive horses (PHR), according the following formulas: