

Original papers

Estimation of infection of internal parasites in horses from different type of farms

Rajmund Sokół¹, Małgorzata Raś-Noryńska¹, Maria Michalczyk¹, Andrzej Raś², Anna Rapacz-Leonard², Sylwia Koziątek¹

¹Department of Parasitology and Invasive Diseases, Faculty of Veterinary Medicine, University of Warmia and Mazury, Oczapowskiego 13, 10-719 Olsztyn, Poland

²Department of Animal Reproduction with Clinic, Faculty of Veterinary Medicine, University of Warmia and Mazury, Oczapowskiego 14, 10-719 Olsztyn, Poland

Corresponding author: Małgorzata Raś-Noryńska; e-mail: malgorzata.ras@uwm.edu.pl

ABSTRACT. Studies were carried out in year 2014 during the pasture period (from April to October) in Warmia and Mazury Region. Fecal samples were taken from cold- and warmblood horses from individual and agrotouristic farms with the different housing, feeding and pasture- care practices. Total of 512 horses were examined (320 mares, 170 geldings and 22 stallions). In the group of 185 horses from individual farms, 119 animals (64.3%) were infected with gastro-intestinal parasites. Among the 372 horses from agrotouristic farms 169 (51.7%) were infected with parasites. Most of the animals expelled the eggs of Cyathostominae. In some individuals occurred eggs of *Strongylus* spp., *Parascaris equorum*, *Strongyloides westeri* and tapeworm of *Anoplocephala*. The number of infected horses from agrotouristic farms was lower than from individual farms, probably due to more regular deworming (usually 2 times a year) and bigger care paid to cleaning pastures.

Key words: horses, helminths, farm type

Introduction

Regardless the age, sex and housing conditions most horses become periodically infected with parasites [1–3]. Adult horses are usually infected with small and large strongyles and tapeworms. Young animals and foals can be also infected with *Parascaris equorum* and *Strongyloides westeri* [4].

Prevalence of the parasitic infection depends on many factors including feeding conditions, and periodical deworming. Horses are particularly prone to parasitic infections during grazing on a pasture. If the pasture is not regularly cleaned from manure, it can easily become a reservoir of increasing number of infective larvae [5,6]. Coprophagia, that commonly occurs in young horses predispose them to infection from adult carriers [4].

The aim of the study was to evaluate the prevalence of parasitic infections in horses kept in individual and agrotouristic farms during the pasture season.

Materials and Methods

Fecal samples were collected from mid-March till the end of October 2014 from 40 individual and 38 agrotouristic farms from Warmia and Mazury region. From each farm samples were collected only once.

Total of 512 horses were examined. From individual farms 155 samples came from mares, 12 from geldings, 18 from stallions. In agrotouristic farms fecal samples were taken from 165 mares, 158 geldings and 4 stallions. None of the examined horses shown parasite specific symptoms like colik, diarrhea or other gastrointestinal disorders. All these horses were between several months and <16 years old. Cold-blooded horses predominated in individual farms whereas in agrotouristic farms were warm-blooded horses predominant. Most horses from individual farms were fed with hay in stables and were grazing grass on a pasture during the day. Horses in agrotouristic farms were additionally fed

Table 1. Results of coproscopic examination of horses from individual and agrotouristic farms

	group	No. infected/prevalence (%)					
		No. examined	Infected with				Free of infection
			strongylids	<i>Parascaris equorum</i>	tapeworms	<i>Strongyloides westeri</i>	
individual	mares	155	104 (67.1%)	2 (1.3%)	3 (1.9%)	0	51 (32.9%)
	geldings	12	8 (66.7%)	0	1 (8.3%)	0	4 (33.3%)
	stallions	18	7 (38.8%)	0	0	1 (5.5%)	11 (61.1%)
	total	185	119 (64.3%)	2 (1.1%)	4 (2.2%)	1 (0.5%)	66 (35.7%)
agrotouristic	mares	165	79 (47.9%)	8 (4.8%)	5 (3.0%)	0	86 (52.1%)
	geldings	158	89 (56.3%)	6 (3.8%)	2 (1.3%)	0	69 (43.7%)
	stallions	4	1 (25%)	0	0	0	3 (75%)
	total	327	169 (51.7%)	14 (4.3%)	7 (2.1%)	0	158 (48.3%)

with grains in a stable. Most horses in individual farms were dewormed irregularly, usually during an occasion of veterinary visit for other reasons. In most agrotouristic farms horses were dewormed in the spring (March–April) and for the second time in the fall (October–November). In most cases 1% ivermectin was used for deworming. Fecal samples from treated horses were collected at the earliest of 8 weeks after deworming.

From each horse samples were collected once only. All fecal samples were examined within 12 hours from collection with the Fülleborn's flotation method with the Darling's solution (50% saturated salt solution + 50% glycerole). Samples were examined in the light microscope under 200× magnification. In cases where strongylid eggs were found, larvae were cultured to classify them as *Strongylus* spp. or Cyathostominae spp. Fecal samples of 10 g were palced on Petri-dishes and incubated for 7 days in 35°C. The Baermann technique was used for recovery of the L3 larvae. From every sample hundred larvae were counted and classified as *Strongylus* or Cyathostominae according to intestinal cell count.

Results

The time of examination covered the entire pasture period. The examined fecal samples contained mostly strongylid eggs. One sample contained *Strongyloides westeri* eggs, 22 samples

Parascaris equorum and 6 samples eggs of tapeworms from the genus *Anoplocephala*.

In the group of horses from the individual farms 66 (35.7%) were free from parasite eggs. Respectively 67.1% of mares, 38.8% of stallions and 66.7% of geldings were infected with gastrointestinal parasites. Regardless of sex and age most horses were infected with small strongyles. In the feces of one young stallion *Strongyloides westeri* eggs were found additionally to strongylid eggs. Coinfection of small strongyles and *Parascaris equorum* were detected in two mares. Tapeworms eggs were found in feces of three mares and one stallion. Because eggs of small and large strongyles are practically undistinguishable, L3 larvae were cultured. Morphological study of the obtained larvae showed a 98.8% share of Cyathostominae and only 1.2% of *Strongylus* spp.

Horses in agrotouristic farms were in more than 48% free from parasitic infection. Respectively 47.9% of mares, 56.3% of geldings and 25% stallions revealed the presence of strongylid eggs. Individual animals were also co-infected with *Parascaris equorum* (eight mares and six geldings) or tapeworm from the genus *Anoplocephala* (five mares and two geldings) (Table 1). All larvae obtained from the samples taken from horses from agrotouristic farms possessed eight intestinal cells and were classified as Cyathostominae.

Mares and geldings in both individual and agrotouristic farms were far more likely infected

with parasites than stallions because of different maintenance. Stallions were kept individually, separated from the rest of the herd. In individual farms mares and geldings shown similar level of parasitic infection, while in agrotouristic, despite common grazing, geldings shown higher prevalence of parasitic infection than mares.

Because fecal samples were collected during the whole grazing season, obtained results were influenced by gradually increasing number of infective larvae on the pasture, and by the fact, that some horses were in the meantime treated with anthelmintics.

Discussion

Gastrointestinal parasitism in horses is very common and affect virtually all grazing animals. Invasive larvae survive winter on the pasture and infect horses from the beginning of pasture period. Because of the short pre-patent period of small strongyles the amount of invasive L3 larvae increases faster during the pasture season than large strongyles and thus are more difficult to control. Many horses remain clinically healthy despite being infected with parasites and shedding large amount of eggs that contaminate pastures. Animals grazing at small areas of pastures, especially not cleaned from manure, are particularly prone to parasitic infection. Many authors drew attention to the widespread of cyathostomiasis in horses kept in various housing systems, with the prevalence depending on age and even sex of examined animals. Among others, Betlejewska [7] found high 98.5–100% share of Cyathostominae in the population of all Strongylidae found in the feces of horses from the study. Only 1.2% to 8% of examined horses were infected with *Strongylus* spp. Gawor [8] assessed the degree of gastrointestinal parasitic infections in warm-blooded horses from 9 horse-riding centres around of Warsaw. Kornaś et al. [9] examined horses from studs, stallions studs and riding clubs that were dewormed twice a year-before and after the pasture period. Most horses were found infected with Cyathostominae, to a lesser extent with tapeworms, *Strongylus* spp. and *Parascaris equorum*. Prevalence of parasitic infection was significantly lower in stallions than in mares from the studs, what is probably caused by different system of maintaining, what is also consistent with our results. Horses kept in alcove stables and using ground paddocks have excreted

the largest number of parasitic eggs, whereas stallions fed with green fodder in stables or kept on separate pastures – the lowest count. In other studies, Kornaś et al. [2] shown the commonness of Cyathostominae infection in horses in various housing systems and the fact that species composition of parasites was similar, no matter how animal were kept. The studies of Gawor et al. [10] also confirmed high prevalence of Cyathostominae infection in horses counting 36.5% to 87.1%. In contrast, examination of cultured invasive larvae showed very low level of *Strongylus* spp. infection (0–1.1%). Gundlach et al. [11] assessing parasitic infections of horses from lubelskie province, found that more than half of examined population was affected with Cyathostominae only. *Parascaris* and tapeworm infections were detected only in horses from individual farms. Similar results achieved Szlągiewicz et al. [12] who examined horses used for therapy of children and for recreation riding. 76.6% of those animals were infected with gastrointestinal parasites, 96.6 % of which belonged to the family Strongylidae and the rest was *Parascaris equorum*. Low participation of large strongyles in the investigated populations of horses could be attributed to their sensibility to commonly used anthelmintics that leads to partial eradication from local environment.

Generally, agrotouristic farms pay more attention to the deworming practices than many individual farmers. Usually agrotouristic farms have less pasture area per horse than individual farmers and are forced to take better care of the area they use and to feed horses with different forage than the grass only. It can explain the general lower prevalence of parasites in horses from agrotouristic farms.

Interesting fact is the difference in coproscopic examination results between mares and geldings from agrotouristic farms. Both groups of animals are kept in the same conditions, usually grazing at the same pasture, so it is difficult to explain the reason for which gelding were more likely infected with parasites than mares.

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