

Use of Cina 30 CH on Diarrhea Caused by *Coccidia* on Backyard Hog Litters

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ABSTRACT

The action of Cina 30 CH on diarrhea caused by *Coccidia* to 140 backyard hog litters was assessed in Camagüey, Cuba. The animals were distributed in two groups, each of 70 individuals. Each group had animals of 10 days of age and 3 kg of initial mean weight. Group 1 was given Cina 30 CH, five sublingual drops every 12 h, until the tenth day; group 2 received Metronidazole (250 mg) orally, ½ tablet (25 mg/kg) every 12 h, for seven days. Upon assessing clinical evolution, significant differences were observed between the two groups. White cells (leukocytes and lymphocytes) were assessed, before and after the treatment. Comparison of weight at weaning (ANOVA), and hematological parameters by t-Student for samples related within the same group produced a significant difference of $P < 0.05$; as well as improved behavior in animals treated homeopathically corroborated that the homeopathic technique tested was effective.

Key Words: diarrhea, hog litter, Cina 30 CH, Metronidazole, coccidia, homeopathy

INTRODUCTION

Swine gastrointestinal parasitosis is generally produced by helminths (*Nematodes* and *Cestodes*) and protozoa, posing a threat for domestic animals, as they may cause anorexia, decreased food digestion, blood loss and plasmatic proteins in the gastrointestinal tract, changes in protein metabolism, mineral reduction, depression of activity in certain intestinal enzymes, and diarrhea (Rodríguez, Ortega, Machain and Santos, 2001; Rodríguez and Vega, 2010 and Sosa, 2012).

Perry and Randolph (1999) reported that coccidiosis is one of the major causes of diarrhea in hog litters. It is caused by the genera *Eimeria* and *Isospora*, which infest the small intestine of young animals, causing destruction of enterocytes and the ensuing diarrhea.

In recent decades, homeopathic therapy has been used in many countries as an efficient, economical therapy free of the major adverse side effects (Valdés, Sotolongo, Escobar, 2012).

The goal was to assess the clinical evolution of hog litters treated with Cina 30 CH and Metronidazole, and estimate the economic effect.

MATERIALS AND METHODS

The research included 140 pigs raised in home backyards in the municipality of Camagüey, where an open phase 2 non-sequential random clinical trial using samples from 10-day old pigs of both sexes with initial mean weight of 3 kg,

were classified as neonates (litter). Their clinical manifestations included diarrheal syndrome caused by coccidia, which tested positive to coprological diagnosis.

The experimental population comprised 140 sick animals. Venipuncture Retro-Orbital Blood Collection (Laboratory Animals, 1993) was practiced in 80 of them, for total and differential white cell count, according to MINSAP (2007).

Sample collection and processing

Rectal swab application: rectal swabs were introduced in every pig to stimulate excretion and collect feces in previously labeled vials. The purpose was to identify animals infested by *Coccidia*. The fecal samples were processed at the Parasitology Lab of the University of Camagüey, using the floating helminth-ovoscopic technique, described by Rodríguez et al. (1987). A Novel microscope 20x was used; the negative animals were discarded.

The parasitic infestation level was assessed quantitatively, according to Demedio, Meireles and Cartas (1984), and classified as,

- Null infestation (N.O.): fecal samples where no coccidia spreading forms were observed.
- Low infestation: the samples contained 1-10 eggs per observation field.
- Mid-infestation: between 10-20 eggs per field of observation.

- High infestation: more than 20 eggs per field of observation.

The hog population was made up of 140 animals in two groups. The experimental group (group 1) comprised 70 animals treated with Cina 30 CH, consisting of five sublingual drops every 12 h, for 10 days, according to Cuesta, Montejo and Duvergel (2007), hydrated with Ringer Lactate solution, intraperitoneally, depending on the dehydration level shown by the animals. The control group (group 2) with the same number of animals as group 1, was treated with 250 mg Metronidazole, orally, ½ tablet (25 mg/kg) every 12 h for seven days, according to Pérez *et al.* (2006), and hydrated in the same way as the experimental group.

Blood was collected at the beginning of the experiment and 15 days after.

The clinical criteria considered to assess the clinical record were,

- Asymptomatic: absence of diarrhea, no more dehydration, response to slight stimuli, and no abdominal pain.
- Diarrhea: moderate dehydration, no response to slight stimuli and abdominal pain.
- Worsened: increased frequency and intensity of diarrhea, moderate or intense dehydration, marked depression, abdominal pain, chills and stupor syndrome.

The efficacy of the therapy was assessed according to the animal proportion recovered on the seventh day of treatment through binomial test:

- Efficient: when the animal was asymptomatic on the seventh day of treatment.
- Inefficient: if the animal was in worse conditions or dead on the seventh day of treatment.

The weights at weaning were subjected to variance analysis with 95 % confidence level, using SPSS (2006). The white cells were tested through t-Student before and after the treatment, for samples related within the same group, to compare the initial and final parameters and perform contrast statistics to compare the treatments.

RESULTS AND DISCUSSION

Table 1 shows differences in the clinical evolution of the treated animals ($P < 0.05$); 95.7 % of

individuals in group 1 (Cina 30 CH); 67 % were asymptomatic; 2.8 % improved; and 1.5 % died on the seventh day of treatment. Whereas in group 2, only 92.8 % was asymptomatic; 4.4 % worsened; and 2.8 % died.

Diarrhea is a defense mechanism of the body, through which organisms speed up the disposal of bacteria, parasites and other irritating substances. The conventional drugs may control diarrhea, but tend to cause more irritating syndromes and symptoms, resulting from the suppression of the body's natural defenses (Solórzano, 2004).

These results corroborate how fast coccidiosis-related diarrhea remission is produced, using homeopathic treatment.

Death was produced by worsening of the symptoms; therefore, observation and precaution are key elements in the diagnosis of diarrhea and the causes that may originate it (García and Cabrera, 2009).

Rodríguez *et al.* (2001) acknowledge that in backyard hog raising, one of the most frequent parasites are *Coccidia* flagelates. The occurrence of parasitosis is closely related to animal production and handling; Gerwert, Failing and Bauer (2004); and Epe, Coati and Schnieder (2004) claimed that the frequency of helminthiasis and protozoa, like coccidia, is higher in extensive productions, because they spread quickly through the herd, since oocysts are hard to destroy. Moreover, in production areas with poor hygiene, oocysts may be easily found in the soil or adhered to the sow's breasts.

Table 2 shows homogeneity of initial weight (kg) of animals in both groups. Following the homeopathic treatment, a significant difference ($P < 0.05$) was observed between the control and experimental groups, with higher weight increase in the latter, coinciding with Duarte *et al.* (2005) and Duarte (2006), about weight gain in pigs after the application of homeopathic treatment with improvements in digestion and nutrient absorption processes.

Table 3 shows significant differences in total leukocytes, neutrophils, lymphocytes, monocytes and eosinophils, before and after the treatment, and between the groups, resulting from coccidia-induced diarrhea.

Neutrophils may be increased in spread out or localized acute bacterial infections, since they act

as phagocytes and digest foreign substances, bacteria and other particles (MINSAP, 2007).

Eosinophils are altered during parasitosis, and are essential in the detoxification of the organism (Cruz et al., 2004). These authors also report that increased monocytes above the normal values, occurs as a result of several-day infections. Their function is to destroy damaged blood cells.

Hahnemann (1996) acknowledges that homeopathic drugs are involved in the body's natural effort, stimulate defensive and nervous regulating reactions, act in favor of the body and command and speed up specific healing processes of live organisms.

CONCLUSIONS

Treatment with Cina 30 CH was effective to fight diarrhea caused by coccidia, and improve the general health state in hog litters.

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Table 1. Clinical evolution of animals in groups 1 and 2 on the seventh day of treatment

Clinical evolution	Group 1		Group 2	
	7 th		7 th	
	No.	%	No.	%
Asymptomatic	67	95.7	65	92.8
Improved	2	2.8	3	4.4
Worsened	0	0	0	0
Dead	1	1.5	2	2.8
Total	70	100	70	100

Table 2. Mean and standard error for weight at weaning (kg) per groups

		N	Mean	F	Significance
Initial weight	Cina 30 CH	40	3.090 ± 0138	.000	1.000
	Metronidazole	40	3.090 ± 0138		
	Total	80	3.090 ± 0097		
Final weight	Cina 30 CH	40	9.030 ± 0200	15.585	.000
	Metronidazole	40	8.752 ± 0674		
	Total	80	8.891 ± 0383		

Table 3. T-Sudent for white cells

Hematological parameters	Related differences					
	Mean	Typical deviation	Mean typical error	95 % confidence interval for difference		Significance (bilateral)
	Inferior	Superior	Inferior	Superior	Inferior	
Initial neutrophils-Final neutrophils	11.588	3.713	.415	10.761	12.414	.000
Initial lymphocytes Final lymphocytes	8.938	5.864	.656	7.632	10.243	.000
Initial monocytes Final monocytes	-1.463	1.793	.200	-1.861	-1.064	.000
Initial eosinophils Final eosinophils	19.875	2.441	.273	19.332	20.418	.000
Total initial leukocytes Total final leukocytes	4.100	4.002	.447	3.209	4.991	.000