



## SHORT COMMUNICATION

### Comparative efficacy of ivermectin plus clorsulon and nitroxylnil against naturally infected cattle

Ausraful Islam<sup>1,2\*</sup>

<sup>1</sup>Reap Program, Mennonite Central Committee Bangladesh, <sup>2</sup>Center for Communicable Diseases, icddr;b, Bangladesh

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\*rajibdvmpara@gmail.com

#### Özet

**Islam A.** Doğal enfekte sığırlarda ivermectin ile klorsulan ve nitroksinil uygulamalarının karşılaştırmalı etkinliği. **Eurasian J Vet Sci, 2013, 29, 1, 43-45**

Araştırmanın amacı sığırlarda helmintlere karşı uygun enjektabl formülasyonunun belirlenmesidir. Elli altı adet sığır üç gruba ayrıldı. Birinci grup (n: 27), ikinci grup (n: 16) ve üçüncü grup (n: 14) sırası ile ivermectin+klorsulan, nitroksinil ve her iki ürün birlikte uygulandı. Her üç grupta da ilaçlar *Fasciola* türlerine karşı %100 etkili bulundu. Birinci grupta *Paramphistomum* türlerine ait yumurtalar araştırma süresince belirlendi ve ilaç %80 oranında etkinlik gösterdi. Strongyles türlerine ait yumurtalar 60 gün süresince tespit edildi. İkinci grupta *Paramphistomum* ve strongyles türlerine karşı %100 etkinlik gözlenmedi. Üçüncü grupta strongles karşı 30. günden sonra araştırma sonuna kadar %100 etkinlik belirlendi. *Paramphistomum* yumurtaları uygulama sonrası 60. günde kayboldu. *Paramphistomum* türlerine karşı kombine ilaç uygulamalarının ivermectin+klorsulon uygulamalarından daha etkili (p<0.05) bulundu. İvermectin, klorsulon ve nitroksinil kombinasyonu kontrol programlarında başarılı bir şekilde kullanılabilir.

**Anahtar kelimeler:** Etkinlik, ivermectin, klorsulon, nitroksinil

#### Abstract

**Islam A.** Comparative efficacy of ivermectin plus clorsulon and nitroxylnil against naturally infected cattle. **Eurasian J Vet Sci, 2013, 29, 1, 43-45**

This study was conducted to determine a suitable injectable preparation against to helminthes in cattle. Fifty six cattle were divided to three groups. The first (n: 27), second (n: 16) and third (n: 14) group were treated with the drug containing ivermectin+clorsulon, nitroxylnil and combination of both, respectively. In all three groups, the drugs showed 100% efficacy against *Fasciola* sp. In the first group, ova of *Paramphistomum* sp. were present in all post treatment observation and the drug showed 80% efficacy during the last observation. The ova of strongyles were absent at 60 days post treatment observation. In the second group, 100% efficacy of nitroxylnil was not observed against *Paramphistomum* sp. and strongyles. In the third group, combined drug showed 100% efficacy against strongyles from 30 days post treatment observation up to last observation. The ova of *Paramphistomum* sp. were absent only at 60 days post treatment observation. The efficacy of combined drugs treatment was significantly (p<0.05) higher than ivermectin plus clorsulon treatment against *Paramphistomum* sp. Combination of ivermectin, clorsulon and nitroxylnil can successfully be used in the control programs.

**Keywords:** Efficacy, ivermectin, clorsulon, nitroxylnil.



The agro-ecological and geo-climatic conditions of Bangladesh favor rapid multiplication and dissemination of parasites (Garrels 1975). Parasitism is responsible for deteriorating the health and productivity of livestock (Perry and Randolph 1999). Although oral anthelmintics are used in the treatment, continuous decreased efficacy of the drug through fecal sample examination is found. Anthelmintic resistance is not uncommon in Bangladesh and resistance to albendazole has been reported (Hoque et al 2003). Moreover, the oral preparation of the anthelmintic was found either difficult to be used by the farmers or they were unwilling to use it. For this reason, we tried to search for an effective injectable alternative and two broad spectrum injectable dewormers were taken into consideration. One was the combination of ivermectin+clorsulon and another was nitroxylin.

Fifty six cattle (131±5.57 kg, 2.86±0.27 years), which had helminthiasis, were divided into 3 groups. The first group (n: 27) was treated with the drug containing ivermectin+clorsulon (Clo-mectin C® inj., ivermectin 10 mg + clorsulon 100 mg in 1 mL, 1 mL/50 kg dose, SC). The second group (n: 16) was treated with a drug containing nitroxylin (Dovenix® inj., 250 mg nitroxylin in 1 mL, 1 mL/25 kg, SC). Both drugs were used in case of third group (n: 14). Fecal samples were collected for 5 times: pretreatment and then 15, 30, 45 and 60 days post treatment. Pre and post treatment eggs per gram of feces (epg) for each group was calculated according to the method described by Thienpont et al (1979). The eggs were identified according to the keys and descriptions given by Soulsby (1982) and Thienpont et al (1979).

Efficacy % (E) of anthelmintics was calculated using the formula:

$$\text{Efficacy \%} = \frac{[(\text{Mean epg before treatment} - \text{Mean epg after treatment}) / \text{Mean epg before treatment}] \times 100}{1}$$

The effects of drugs were compared with least significant difference (LSD).  $p < 0.05$  level was accepted statistically significance.

In the first group, pretreatment EPG (mean±SD) of *Fasciola sp.*, *Paramphistomum sp.*, and strongyles were 169±137, 192±162 and 30.7±54, respectively. In the second group, pretreatment EPG (mean±SD) of *Fasciola sp.*, *Paramphistomum sp.*, and strongyles were 137±120, 237±221 and 87.5±131, respectively. In the third group, pretreatment mean EPG (mean±SD) of *Fasciola sp.*, *Paramphistomum sp.* and strongyles were 107±126, 235±121 and 71.4±113, respectively.

Ivermectin plus clorsulon showed 100% efficacy against fascioliasis in all post treatment observations up to 60 days (Table 1). This finding is in agreement with that of other scientists (Ziegler 1979, Courtney et al 1985, Ibarra-Velarde et al 2001, Hanna et al 2006). This combination showed 80% efficacy against *Paramphistomum sp.* on 60 days post treatment. Poor efficacy of this combination against paramphistomes was reported (Courtney et al 1985). 100% efficacy against strongyles was observed

at 60 days post treatment. Similar observation was reported by several authors (Armour et al 1980, Benz and Ernst 1981, Egerton et al 1981A, Egerton et al 1981B). Nitroxylin showed 100% efficacy against *Fasciola sp.* in all post treatment observations. Similar observation was reported by Wellington (1978) and Keyyu et al (2008). Nitroxylin showed 82% efficacy during 15 days post treatment and 87% during 60 days post treatment against *Paramphistomum sp.* This observation was supported by that of Keyyu et al (2008). 100% efficacy of nitroxylin against strongyles was not observed during any observation and at the last observation the efficacy was 64%. This finding contradicted with that of Wellington (1978) who reported high efficacy of nitroxylin against strongyles of cattle. 100% efficacy of ivermectin, clorsulon and nitroxylin was observed against *Fasciola sp.* in all the post treatment observations. Combined treatment with nitroxylin, clorsulon and ivermectin showed from 83% to 88% efficacy against fascioliasis after 14 week post treatment (Hutchinson 2009). The ova of *Paramphistomum sp.* was absent only at 60 days post treatment observation. This finding was supported by that of Courtney et al (1985) and Keyyu et al (2008). 100% efficacy was observed against strongyles from 30 days post treatment up to last observation. This observation was supported by the findings of several authors (Wellington 1978, Armour et al 1980, Benz and Ernst 1981, Egerton et al 1981A, Egerton et al 1981B).

All the treatment groups were free from fascioliasis up to 60 days and there was no significant difference among them (Table 2). The efficacy of combined ivermectin, clorsulon and nitroxylin treatment was significantly ( $p < 0.05$ ) higher than that of ivermectin and clorsulon treatment against *Paramphistomum sp.* The cattle treated with combined ivermectin, clorsulon and nitroxylin were free from paramphistomiasis on 60 days post treatment. We assume that synergistic action of clorsulon and nitroxylin was more effective against paramphistomiasis (Fairweather and Boray 1999). The efficacy of the drugs did not vary significantly against strongyles though combined ivermectin, clorsulon and nitroxylin showed better efficacy compared two other two.

The overall efficacy of combined ivermectin, clorsulon and nitroxylin was significantly ( $p < 0.05$ ) higher than that of combined ivermectin and clorsulon treatment (Table 3). This finding was supported by others (Fairweather and Boray 1999). The first combination protected the animals up against parasitic infections to 60 days on an average whereas the second combination protected the animals up to 51 days on an average. Nitroxylin protected the animals up to 55 days on an average though relapsing time did not vary significantly with other two combinations.

The combination of ivermectin, clorsulon and nitroxylin showed the highest efficacy against the helminth parasites. This combination is also effective against the ectoparasites.





Table 1. Efficacy of anthelmintics at different days of trial on cows.

Helminths	15 days			30 days			45 days			60 days		
	A	B	C	A	B	C	A	B	C	A	B	C
<i>Fasciola sp.</i>	E	E	E	E	E	E	E	E	E	E	E	E
<i>Paramphistomum sp.</i>	72%	82%	NE	82%	76%	75%	78%	89%	90%	80%	87%	E
Strongyles	12.5%	71%	30%	25%	71%	E	88%	79%	E	E	64%	E

E= 100% effective; NE= Not effective

Table 2. Comparison of effects of anthelmintics against the helminths of the cows.

Helminths	Relapsing time in day (mean±SE) of the various treatment		
	I+C	N	I+C+N
<i>Fasciola sp.</i>	60.0±0.00	60.0±0.00	60.0±0.00
<i>Paramphistomum sp.</i>	36.9±5.38 <sup>a</sup>	48.7±6.05 <sup>ab</sup>	60.0±0.00 <sup>b</sup>
Strongyles	58.8±1.15	52.5±5.12	60.0±0.00

<sup>a,b</sup>: Different letters in the same line are significant (p<0.05). I; ivermectin, C; clorsulon, N; nitroxylin

Table 3. Comparison of overall effects of anthelmintics against parasitic infection of the cows.

Groups	Relapsing time Mean±SE
Ivermectin+Clorsulon	51.0±2.09 <sup>a</sup>
Nitroxylin	55.3±2.03 <sup>ab</sup>
Ivermectin+Clorsulon+ Nitroxylin	60.0±0.00 <sup>b</sup>

<sup>a,b</sup>: Different letters in the same column are significant (p<0.05).

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