

Communication

Efficacy of chlortetracycline for controlling goat coccidiosis in Burundi

M. Dacasto¹U. Cocuzza¹

DACASTO (M.), COCUZZA (U.). Efficacité de la chlortétracycline dans la lutte contre la coccidiose caprine au Burundi. *Revue Élev. Méd. vét. Pays trop.*, 1994, 47 (4) : 379-380

Dix-huit chèvres croisées du Burundi, infectées naturellement à différents degrés par plusieurs espèces de coccidies du genre *Eimeria*, ont reçu par voie orale 25 mg/kg/jour de chlortétracycline. Après 9 jours de traitement continu, il a été démontré qu'on pouvait atteindre des pourcentages d'efficacité dépassant 99.0 p. 100. Aucune réaction défavorable n'a été remarquée. Ces résultats confirment que cet antibiotique est efficace pour la lutte contre la coccidiose caprine au Burundi.

Mots clés: Caprin - Coccidiose - *Eimeria* - Anticoccidien - Antibiotique - Tétracycline - Burundi.

Introduction

In Burundi, coccidiosis is considered one of the major health problems in goat herds, as displayed by the presence of infection percentages varying from 20.7 up to 98.7 % (7). In this respect, several conditions are recognized as increasing the magnitude of this problem: the wet climate of the area, with mean annual rain fall and temperature of 1,000-1,200 mm and 19-23°C, respectively; the parcellar allocation of flocks, as each farmer has 4 to 5 goats grazing free under children's control ("gardiennage") or tied with a rope ("attachement au piquet") in the neighbourhood of their estate; the pasture contamination; and, lastly, the lack of programs aimed reducing and controlling the oocysts' environmental contamination level (4).

Chlortetracycline (a natural antibiotic from *Streptomyces aureofaciens*) is used nowadays, alone or in combination with other chemioantibiotics, for prevention or treatment of coccidiosis among farm animals (1, 3, 8, 9).

The aim of the present study was to test its effectiveness as an anticoccidial in goats in Burundi. The experiment was undertaken in the region of Buyogoma where routine coprological investigations indicated the presence, more prevalent in young animals than adults, of high levels of coccidia oocysts belonging to multiple *Eimeria* species. Furthermore, large amounts of oocysts per gram (OPG) of feces were found also in goats previously subjected to preventive treatment against coccidiosis with amprolium.

1. Dipartimento di Patologia Animale, Settore di Farmacologia e Tossicologia, Università di Torino, via Nizza 52, I-10126 Turin, Italie.

Reçu le 28.2.1994, accepté le 22.11.1994.

Materials and Methods

Eighteen cross-bred goats less than 6 months old (7 males and 11 females), naturally infected with different *Eimeria* species coccidia, were used. These animals however did not show any clinical symptoms of coccidiosis. Three experimental treatment groups (A, B and C) were randomly established with 6 animals each. Group A remained untreated (control). Groups B (goats previously treated with amprolium) and C were administered chlortetracycline orally (Isospen®, Teknofarma s.p.a., Torino, Italia) at a dose rate of 25 mg/kg of body weight per day.

All goats (particularly those of control group) were clinically monitored throughout the trial; treated animals were observed daily for any occurrence of possible adverse reactions. Fecal samples from the rectum were taken on day 0 (before the treatment) and every 3 days thereafter until complete negativity of examination was obtained. Coccidia OPG counts were determined by a modified Mc Master technique (10). OPG counts were transformed to the natural logarithm of (count+1) for calculating geometric means and percentage effectiveness relative to the control group. Statistical analysis of the data was performed by a one way analysis of variance (ANOVA) followed by Bonferroni's t-test, with the level of significance set at $p < 0.06$ (6).

Results

The tolerance was very good and no adverse reactions were observed during the duration of the experiment. After 3 days of treatment (table I), a significant decrease in OPG counts was observed in groups B and C; meanwhile, a rise in morphological alterations was noticed in the oocysts isolated from feces.

TABLE I Geometric mean oocysts per gram (OPG) counts, effectiveness percentages and level of significance compared with control in goats orally administered 25 mg/kg bw/day chlortetracycline.

Groups	Days				
	0	3	6	9	12
A	10,622	10,305	10,111	10,584	19,975
B efficacy (%)	9,397 —	4,373 67.5	46* 99.5	0* > 99.9	0* > 99.9
C efficacy (%)	16,440 —	9,699 5.9	2,724 73.0	13* 99.9	0* > 99.9

A : controls (n = 6); B : amprolium treated plus chlortetracycline (n = 6); C : chlortetracycline.

*: significantly different from control group mean ($p < 0.06$).

Communication

On the day 6, effectiveness percentages greater than 99.0 % and consequent statistically significant reductions ($p < 0.06$) in OPG counts were observed in group B. The negativity of coprological tests was reached by the day 9 of treatment.

In group C, effectiveness percentages higher than 99.0% were reached only after 9 days of treatment, in accordance with the statistically significant decrease ($p < 0.06$) in OPG counts. The negativity of coprological investigations was obtained in slightly longer times than in group B (12 days). The mean times per group for the complete negativity of coprological examinations were 8 and 10.5 days for groups B and C, respectively.

Discussion

The significant decrease in OPG counts and the rise in morphological alterations of the oocysts observed in both treated groups were entirely similar to those seen in other veterinary species following the same dosing (2, 5); these findings show that chlortetracycline could be helpful in the control of goat coccidiosis in Burundi, confirming results previously obtained in other food-producing animals (1, 8, 9). In the goats of group B, which had been previously treated with amprolium, the mean time required to obtain the complete negativity of coprological tests was 8 days; in group C, given chlortetracycline alone, it was slightly longer (10.5 days).

All the goats used in this experiment did not show clinical signs of coccidiosis. To verify the potential effectiveness of chlortetracycline as a therapeutic agent, some goats of the same age with severe diarrhoea and higher OPG counts were treated outside the experiment, but in the same field conditions, with the same chlortetracycline dosage regimen. The complete negativity of coprological examinations, together with the consequent remission of symptoms, was reached within 15 days.

In the region of Burundi where this experiment was performed, the control of such protozoan disease is based only on preventive treatments with amprolium. Inappropriate or prolonged use in goat herds might be the cause of the occurrence of drug-resistance phenomena, with consequent high levels of infection (7). However, in our experimental conditions, chlortetracycline was also effective in lowering (effectiveness percentages greater than 99.0 %) high OPG counts found in goats already treated with amprolium.

Conclusion

Chlortetracycline administered orally at a dose rate of 25 mg/kg body weight/day is effective for the control of goat coccidiosis in Burundi. The effectiveness percentages obtained are greater than 99.0 % and the mean time required for the complete negativity of coprological investigations is 10.5 days. No adverse reactions were been reported in treated animals.

In the near future, the use of of this antibiotic for the control of goat coccidiosis in tropical areas of Africa like

Burundi could be regarded as a matter of concern, because of its economical cost/profit ratio (relatively low cost, high effectiveness) and the fact that it can be mixed in the feed alone or in combination with sulfa drugs.

Acknowledgements

This study was partly supported by a grant from Centro Piemontese di Studi Africani, Torino, Italia. We acknowledge also Comunità Impegno Servizio Volontariato (CISV) for their logistical support in Burundi.

References

1. AJAYI (J.A.), TODD (A.C.). Relationships between two levels of aureomycin-sulphamethazine supplementation and acquisition of resistance to ovine coccidiosis. *Br. vet. J.*, 1977, **133** (2): 166-174.
 2. ALTMAN (I.E.). Treatment of canine coccidiosis (*Isoospora bigemina*) with aureomycin. *J. Am. vet. med. Ass.*, 1951, **119** (894): 207-209.
 3. BERGER (H.), MADDOCK (H.M.), GALE (G.O.), SIMKINS (K.L.). Evaluation of chlortetracycline-sulfamethazine combinations against experimental coccidiosis in swine. *Agri-Practice*, 1985, **6** (1): 19-22.
 4. COCUZZA (U.). Efficacia dell'ivermectina e della chlortetraciclina nelle parassitosi dei caprini in Burundi. Tesi di Laurea, Facoltà Medicina Veterinaria, Torino, 1992. p. 95-98.
 5. DACASTO (M.), FARCA (A.M.), RE (G.), COLOMBATTI VALLE (V.), GIAQUINTO (M.). La chlortetraciclina nella terapia della coccidiosi dei piccoli animali. *Veterinaria*, 1992, **6** (2): 95-98.
 6. GLANIZ (S.A.). Statistica per discipline biomediche. Milano, Italia, McGraw-Hill Libri, 1988.
 7. MUSERU (B.). Epidémiologie des maladies des petits ruminants en milieu rural : cas des helminthoses gastro-intestinales des chèvres et des moutons en commune de Giheta, province de Gitega, Burundi. Gitega, Institut pour la Recherche Agro-Zootéchnique, 1989. p. 1-33.
 8. ONAWUNMI (O.A.), TODD (A.C.). Suppression and control of experimentally induced porcine coccidiosis with chlortetracycline combination, buquinolate, and lincomycin hydrochloride. *Am. J. vet. Res.*, 1976, **37** (6): 657-660.
 9. PRITCHARD (R.H.), THOMSON (J.U.), SAI IEELA (S.), HILDRETH (M.B.), LUCAS (T.E.). Performance of chlortetracycline-sulfamethazine combinations in feeder calves with coccidiosis. *Agri-Practice*, 1993, **14** (3): 24-29.
 10. THIENPONT (D.), ROCHETTE (F.), van PARIJS (O.F.J.). Diagnosis helminthiasis through coprological examination. Beersse, Belgium, Janssen Research, 1979.
- DACASTO (M.), COCUZZA (U.).** Efficacy of chlortetracycline for controlling goat coccidiosis in Burundi. *Revue Elev. Méd. vét. Pays trop.*, 1994, **47** (4): 379-380

Eighteen cross-bred goats of Burundi naturally infected to varying degrees with multiple coccidia species of the genus *Eimeria* were orally administered 25 mg/kg body weight/day chlortetracycline. Effectiveness percentages more elevated than 99.0 % were reached within the 9th day of treatment. No adverse reactions have ever been reported. Results demonstrate that the antibiotic is effective for the control of coccidiosis of goats naturally infected in Burundi.

Key words : Goat - Coccidiosis - *Eimeria* - Anticoccidials - Antibiotic - Tetracycline - Burundi.