Efficacy of a subcutaneous injection of eprinomectin in lactating goats experimentally challenged with gastrointestinal and lungworms

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Objectives

Health and productivity of dairy goats continue to be impacted by gastrointestinal nematodes (GIN) and lungworms (LW). Eprinomectin (EPN) is frequently selected for treatment as it is considered effective and without milk withdrawal period. However, some factors such as the lactation status can have an impact on EPN pharmacokinetics and potentially its efficacy. For instance, reduced bioavailability has been reported for topical EPN in lactating goats when compared to dry goats (Dupuy*et al.*, 2001). To evaluate if this can alter the efficacy of an injectable solution of eprinomectin (Eprecis[®] 2%, Ceva Santé Animale), a study was performed in lactating goats using the dose currently registered in cattle, sheep, and goat (0.2 mg/kg).

Material and methods

This study was a blinded, randomized, controlled trial performed according to VICH guidelines (GL7 and GL14). The protocol was reviewed by the Moredun Animal Welfare and Ethical Review Board, and the study run under the UK Home Office Project Licence (No PFA7E7AD6) following Animal Scientific Procedures Act 1986. Eighteen (18) worm free lactating goats from a conventional dairy goat farm were included and experimentally challenged on Day-28 with a mixed culture of infective gastrointestinal and lung nematode larvae (Haemonchus contortus, Trichostrongylus colubriformis, Teladorsagia circumcincta, Dictvocaulus filaria). Average numbers of parasites inoculated complied with the recommended numbers for parasite infection models for anthelminthic evaluation in goats. The isolates used were recent European strains isolated from field (except T. colubriformis from laboratory isolate). At D-1, faecal samples were collected to confirm patent infestation in all animals (minimum > 150 EPG). Fifteen animals were ultimately enrolled in the study, as three goats shown a faecal egg count below the shedding threshold. On D0, goats were randomly allocated based on their D-1 faecal egg count (FEC) and on D0 body weight into two groups of nine goats; group 1 was treated with Eprecis[®] 2% at 0.2 mg/kg BW by subcutaneous injection while group 2 remained untreated. The goats were milked once daily, and their general health was assessed twice daily from arrival until the end of study. Any sign of abnormal behaviour or a change in feeding habits was reported. Faecal egg shedding was regularly monitored from D0 to D14, with a total of six faecal egg counts, performed at D3, 5, 7, 9, 11 and 14. On D14, all goats were euthanised as required by VICH guidelines, and the abomasum, small intestine and lungs removed, processed and sub sampled, to record the number and species of worms. To assess the effect of Eprecis® 2%, the nematode counts at necropsy of treated animals were compared to those of control animals, using Wilcoxon Tests, with significance set at the 0.05 level. The effectiveness of Eprecis[®] 2% against each worm species was calculated as the difference in geometric means of the counts between the control group and the treatment group at D14, expressed as a percentage based on the geometric mean of the control group counts. Statistical analyses were performed using SAS version 9.4 software.

Results

The treatment was well tolerated. After treatment, mean FEC decreased in the treated group and remained lower than 3 EPG until the end of the study while mean FEC in the control group remained higher than 849 EPG. At D14, goats in the treated group had very limited or zero total worm counts whereas all animals from the control group had high worm burden. Measured efficacy was 100.0% against *H. contortus* and *T. colubriformis*, 99.9% against *T. circumcincta* and 96.8% against *D. filaria*. The mean body weights in both groups increased slightly from D0 to D14 (respectively of +2.8 kg in the treated group and +1.6 kg in the control group).

Conclusions

Eprinomectin injection (Eprecis[®] 2%), administered at the label dose (0.2 mg/kg) is highly effective and safe against gastrointestinal and lungworms in lactating goats. These findings are in line with the results obtained after experimental GIN infection and treatment at label dose with Eprecis[®] 2% in dry goats (Brique-Pellet *et al.*, 2017) and thus suggest that lactational status of goats does not impact the efficacy of this injectable eprinomectin solution.