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Transmission of the caprine arthritis–encephalitis virus through artificial insemination

Transmissão do vírus da artrite-encefalite caprina através da inseminação artificial

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Introduction

The objective of present study was to evaluate the transmissibility of the caprine arthritis–encephalitis virus (CAEV) through artificial insemination (AI), and to assess the influence of viral load on this probable transmission. It also aims to verify whether the inflammatory process caused by the use of intravaginal sponges would facilitate virus entry in the female reproductive tract.

Materials and Methods

For this purpose, 30 undefined breed goats were used, all serologically negative for CAEV. One Anglo-Nubian buck, also seronegative, was used to artificially inseminate females in this study. His semen was contaminated with the standard CAEV-Cork virus strain, with two distinct infective titres, one 10^6 $TCID_{50}$/mL, for high viral load (HVL), and another of 10^2 $TCID_{50}$/mL, for low viral load (LVL). Females had estrus synchronized by using two protocols, intravaginal sponges in Group 1 (G1, N = 15) and auricular subcutaneous implants in Group 2 (G2, N = 15). For inseminations, the goats were divided into three groups of 10 animals each. One group was inseminated with HVL, another with LVL and the third with semen from the same virus-free buck, as a negative control. The experiment was conducted in accordance to the ethical principles for animal experimentation. Statistical analyses were performed by the chi-square test ($P < 0.05$).

Results and Discussion

Thirty days after insemination, the experimental infection was confirmed, when 12 out of the 20 (60%) inseminated goats had seroconverted. Sixty days after insemination, all females from the HVL and LVL groups presented anti-CAEV antibodies. There was no statistical difference ($P > 0.05$) among groups regarding viral loads nor between the two estrus synchronization protocols. Goats from the control group remained seronegative throughout the experiment (12 months). Concerning reproductive parameters, no difference was found between the control group and the infected groups. There are no data in the literature on quantities of potentially harmful viral loads which are present in semen or that are capable of transmitting infection. Some studies demonstrate factors which may influence CAEV presence in semen, such as stress caused by increased sexual activity in the breeding season and during times of high environmental temperature (Andrioli et al., 2006; Paula et al., 2009). Based on these results, it is possible to conclude that the virus can be transmitted through artificial insemination with infected semen. Therefore, the venereal route is a potential route of infection.

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