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Influence of transrectal palpation training on cortisol levels and heart rate variability in cows

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Abstract

Transrectal palpation of cows is a day-one competence for veterinary students, and it is an essential skill for the diagnosis of pregnancy as well as reproductive disorders. We hypothesized that transrectal palpation induces a stress response in cows, and this stress response may vary with the training students receive before their first transrectal palpation. Therefore, 52 Holstein-Friesian cows were used at the University of Veterinary Medicine Hanover. The experimental group (n = 26) was subjected to transrectal palpations by first and second-year students. Salivary and serum cortisol levels were assessed before and after the intervention. A control group (n = 26) was only restrained and tested for changes in salivary and serum cortisol.

A total of 12 cows of the experimental group were examined by two groups of students with different training on two days. The examination was performed one day by students who were theoretically prepared for transrectal palpation in cows (NO-SBT, n = 12). The other day, students who underwent a simulator-based training (SBT, n = 12) performed the examination. The cortisol concentrations, as well as heart rate (HR) and heart rate variability (HRV), were measured in the examined cows. Blood and saliva samples were collected 25 min and immediately before (0 min) and 25 min and 85 min after the end of the examination in the experimental group. Serum cortisol levels between 0 min and 25 min were increased by Δ2.6 ng/ml in the cows in the experimental group compared to Δ-0.3 ng/ml in the control group (P = 0.001). The increases in cortisol in saliva (P = 0.033) and serum (P = 0.013) after transrectal palpation were higher in the NO-SBT group Δ0.32 ng/ml saliva, Δ5.8 ng/ml serum than in the SBT group Δ0.03 ng/ml saliva, Δ2.1 ng/ml serum. For HR and HRV analysis values recorded 30 min before the transrectal palpation (-30 min) were set as the baseline concentrations the sequence recorded during the transrectal examination started at 0 min. While the mean HR did not change significantly during the transrectal palpation (80 to 83 bpm SBT students; 81 to 79 bpm NO-SBT students), the HRV parameter square root of the mean squared

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