Simulation system for puncture of the *Vena jugularis sinistra* in horses

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Introduction

The training of invasive procedures, which require both eye-hand coordination as well as ambidextrous maneuvers are hardly to learn in theory or virtual environments. The benefit of simulation training enables the veterinarian-in-training to repeat procedures without ethical concerns as often as necessary and even mistakes can be admitted without harming the patient. In order to enable realistic simulation training for a venous puncture, a training model based on a horse's head and neck has been developed and validated by experts and undergraduate students.

Methods

The neck section of the simulation horse model consists of a removable module that includes an artificial vein. The vein is embedded in various synthetic materials that provide a realistic look and feel. A controllable pump allows different volumes of artificial blood running through the vein and facilitates several levels of difficulty.

Results

The simulation model has been validated by experienced veterinarians that confirmed the realistic appearance of the simulation. Furthermore a randomized study with veterinary undergraduate students assessed the effect of training on the simulation model prior to a blinded Objective Structured Clinical Examination (OSCE) on real horses. The study group that trained the procedure prior to the exams outperformed the control study group.

Conclusion

We developed and validated a realistic simulation system for puncture training of the left jugular vein on adult horses. Therewith, we provide a comprehensive tool for instruction and training purpose as well as exams. The proposed system improves training of invasive procedures by enhancing theory lectures with practical training.