Effect of emptying the vasculature before performing regional limb perfusion with amikacin in horses.

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Introduction

Over the past years intravenous regional limb perfusion (IV-RLP) has become a common method for administration of local antimicrobials in the treatment of orthopaedic infections of the equine distal limb. IV-RLP achieves high concentrations of antimicrobial in the region of infection, which is thought to improve the success of therapy when treating bacterial infections.

Emptying the vasculature with an Esmarch bandage before intravenous regional anesthesia is commonly performed in humans to prevent leakage of the solution under the tourniquet but there is no evidence for its efficacy in horses for antimicrobial intravenous regional limb perfusion (IV-RLP).

Materials and methods

Eight clinically healthy horses underwent two IV-RLP with amikacin in a randomized, cross over design (ethics approval #17603). The first treatment was randomly assigned to either the left or right front limb and subsequent treatment applied to the contralateral limb. A median, ulnar and medial cutaneous antebrachial perineural block was performed before application of the tourniquet. Horses received an IV-RLP with amikacin with or without exsanguination before applying a pneumatic tourniquet at the level of the forearm. The exsanguination was performed by wrapping around the limb a wide elastic tourniquet (Esmarch) starting from the coronary band to the distal aspect of the radius. Two grams of amikacin sulfate were diluted with sterile saline solution to a final volume of 60 mL. Blood was collected from the jugular vein (before tourniquet removal) and synovial fluid from the radiocarpal and metacarpophalangeal joints (5 min after tourniquet removal and at 24h) for amikacin determination. The procedure was video recorded to assess horse movement.

Results

There was no difference in amikacin concentrations in the plasma or synovial fluid from the radiocarpal joint between groups. There was higher concentration of amikacin in the synovial fluid from the metacarpophalangeal joint immediately after tourniquet removal (35 min post injection) in the group with exsanguination of the limb prior to IV-RLP. Horse movement did not differ significantly between groups.

Relevance to clinical equine practice

Emptying the vasculature with an Esmarch bandage before an IV-RLP can increase amikacin concentrations in the metacarpophalangeal joint of horses. This technique may improve efficacy of the regional limb perfusion when treating septic injuries involving synovial structures in the distal portion of the limb. The technique can be easily performed in clinical practice on standing horses, and does not require specialized facilities or equipment.

Declaration of interest

None declared.