

AASRP Research Summaries

Experimental infection of pregnant sheep with bovine viral diarrhea virus 1b (AU526)

T. Kuca, DVM¹; **T. Passler**, DVM, PhD, DACVIM¹; **K.P. Riddell**, DVM, MS¹; **J.D. Neill**, PhD²; **B.W. Newcomer**, DVM, PhD, DACVIM¹; **P.H. Walz**, DVM, PhD, DACVIM¹

¹Departments of Clinical Sciences and Pathobiology, College of Veterinary Medicine, Auburn University, Auburn, AL 36849

²Ruminant Diseases and Immunology Research Unit, National Animal Disease Center, Department of Agriculture, ARS, Ames, IA 50010

Introduction

Bovine viral diarrhea virus (BVDV) lacks strict host-specificity and can infect many species in the order Artiodactyla. BVDV infection in pregnant heterologous hosts can be deleterious. Limited information exists regarding genomic changes occurring in BVDV upon infection of heterologous hosts. Using a BVDV isolate previously demonstrated to cause PI cattle, goats, and white-tailed deer, this study investigated the outcome of serial infection in pregnant BVDV-naïve sheep, a heterologous species that is phylogenetically closely related to cattle.

Materials and Methods

Six pregnant ewes were included between days 30 and 60 of gestation. On day 0, the first ewe was intravenously inoculated with 1ml of BVDV 1b AU526 (1x10⁶ CCID₅₀/mL) of bovine origin. Weekly, 1 additional ewe was intravenously inoculated with 1 mL of serum from the preceding ewe following confirmation of viremia. Blood samples were

collected for virus isolation and RT-PCR (days 0, 5, 7, 9) and virus neutralization (day 0 and every 28 days until lambing). Gestational viability was evaluated by transabdominal ultrasonography every 28 days.

Results

BVDV infection was confirmed in all ewes by virus isolation and seroconversion. Initially, clinical signs were mild (pyrexia and inappetence) and pregnancies appeared viable. Subsequently, BVDV infection resulted in abortion, fetal mummification, birth of weak lambs, precolostral seropositivity, and birth of persistently infected offspring.

Significance

The outcome of infection with BVDV AU526 of pregnant sheep was similar to previous reports in cattle, goats, and white-tailed deer. Currently, genomic changes of BVDV resulting from serial infection of pregnant sheep are under investigation.

The use of trans-abdominal ultrasound for pregnancy detection and fetal aging before day 45 of gestation in the sheep

A.K. Jones, BS¹; **R.E. Gately**, DVM²; **K.K. McFadden**, BS¹; **S.A. Zinn**, PhD¹; **K.E. Govoni**, PhD¹; **S.A. Reed**, PhD¹

¹Department of Animal Science, University of Connecticut, Storrs, CT 06269

²Department of Environmental and Population Health, Tufts Cummings School of Veterinary Medicine, North Grafton, MA 01536

Introduction

Trans-abdominal ultrasound is a reliable technique for pregnancy detection in the small ruminant, and has become increasingly adaptable to field conditions in a production

setting. Currently, limited information is available related to early pregnancy detection and estimating fetal age using this technique. Therefore, our objective was to determine the accuracy of trans-abdominal ultrasound during early pregnancy in the ewe. We hypothesized that trans-abdominal ultrasound

is sensitive enough to distinguish reproductive status, and determine fetal age and number before day 40 of gestation.

Materials and Methods

To test our hypothesis, 99 Western Whiteface ewes were exposed to 1 of 4 genetically related rams. The day a ewe was marked by a ram was considered day 0 of gestation. Ewes were ultrasounded trans-abdominally (Easi-Scan, BCF Technology, Rochester, MN) 3 times/week with a 5 MHz rectal transducer in the right non-haired abdominal region of the ewe until day 45. Open ewes were re-exposed to the rams and reevaluated if remarked. Due to the large population, ewes were blocked by their initial ultrasound scan at day 20 to 25 (n=52), day 26 to 29 (n=44) or day 30 to 33 (n=17). During each ultrasound, first observation of fetal landmarks, prediction of fetal number, and measurement of fetal length were recorded.

Results

Correct identification of reproductive status was achieved by day 25.7 ± 0.5 , day 28.7 ± 0.4 or day 32.4 ± 0.5 , when scanning was initiated between day 20 to 25, day 26 to 29 or day 30 to 33, respectively. This included 85 pregnant ewes, with the remaining correctly identified as non-pregnant (n=28). Within the pregnant flock, 94% of pregnancies were correctly detected by day 33. In the pregnant ewes, 3 early embryonic losses were identified by day 40. During pregnan-

cy, fluid-filled uterine cross-sections were observed from day 27.9 ± 0.4 onward. Pregnancy was confirmed by the presence of a fetus with a heartbeat on day 28.5 ± 0.4 , with placentomes emerging from the uterine wall beginning on day 33.8 ± 0.4 . Fetal characteristics, such as limb bud separation, fetal genitalia, and the umbilical cord were first observed at day 35.2 ± 0.7 , day 37.9 ± 0.7 and day 38.4 ± 0.7 , respectively. Additionally, fetal length increased from 10.6 ± 1.2 mm to 35.3 ± 1.6 mm. Placentome maturation was observed starting on day 40.6 ± 0.4 and ribs were visualized at day 42.2 ± 0.7 . Evidence of pregnancy, including an enlarged uterus (P=0.04), fetus with a heartbeat (P=0.03) and placentome evagination (P=0.02), was observed earlier when multiple offspring were developing. Accuracy of detecting singletons, twins and triplets was 100, 87, and 31%, respectively. Detection of 80% of the multiple pregnancies was achieved by day 35, with fetal number always underestimated.

Significance

The scanning window between days 28 to 34 for trans-abdominal ultrasound provides useful and diverse information for reproductive efficiency in flock management. This includes visualization, monitoring development, and identification of the number of fetuses. Thus, trans-abdominal ultrasound is sensitive enough to detect reproductive status of a ewe as early as day 25, and specific enough to detect fetal landmarks indicative of fetal age before day 45 of gestation.

Nebulization therapy in small ruminants, 21 cases

J.S. Smith, DVM, MPS¹; M.C. Heller, DVM, PhD, DACVIM²; J.A. Angelos, DVM, PhD, DACVIM²

¹William R. Pritchard Veterinary Medical Teaching Hospital, University of California Davis, Davis, CA 95616

²Department of Medicine and Epidemiology, University of California-Davis, Davis, CA 95616

Introduction

Nebulization therapies are commonly used in humans and small animals. Currently there are published reports on nebulization therapy in horses and calves, but no studies describing this therapy have been reported in small ruminants.

The objectives of this study were to identify the agents and dosages utilized for nebulization therapy in small ruminants at a university teaching hospital. Additional objectives were to describe outcomes vs non-nebulized cases and report any complications arising from therapy.

Materials and Methods

Medical records of small ruminants presented to the University of California-Davis Veterinary Medical Teaching Hospital (VMTH) between January 1, 2000 and March 1, 2015 were evaluated for this study. Cases that had undergone nebulization therapy were selected.

A group of control cases of small ruminants that were not nebulized with a diagnosis of pneumonia were collected from the same search period. A logistic regression was used to compare outcome between groups.