LATE EMBRYONIC AND FETAL LOSSES IN EWES AND RELATIONSHIPS TO STEROIDS AND VASCULAR ENDOTHELIAL GROWTH FACTOR IN SERUM

AB DIXON, JL WINKLER, ME WILSON, DJ MARSH, M KNIGHTS, JL PATE, RA DAILEY, EK INSKEEP

Embryonic and fetal mortality reduce lambing rates and litter sizes in sheep. A study was conducted to determine timing of late embryonic and fetal losses and to examine association of losses with concentrations of progesterone, estradiol-17 , and vascular endothelial growth factor (VEGF) in maternal serum. Number of embryos or fetuses were determined at ultrasonography on d 25, 45, 65, and/or 85 in 957 non-lactating ewes of mixed breeding on 9 farms. Mortality was estimated from differences among consecutive counts at ultrasonography and at birth. Losses occurred throughout pregnancy. Ewes had no loss, loss of a complete pregnancy (**L**) or loss of one, but not all embryos or fetuses from a multiple pregnancy (**PL**). Serum samples on d 25, 45, 65, and /or 85 were radioimmunoassayed for hormones. Logistic regression was used to examine for relationships between subsequent losses and the concentrations of progesterone, estradiol, and VEGF on those days. Progesterone on d 25 was of predictive value; concentrations of progesterone on other days were not. From d 25 to 65 and from d 25 to term, **L** decreased as progesterone on d 25 increased ($P < 0.05$). From d 25 to 45, **PL** increased as progesterone on d 25 increased ($P < 0.05$), but from d 65 to term, **PL** decreased as progesterone on d 25 increased ($P < 0.05$). Concentrations of estradiol had no predictive value for either **L** or **PL**. Concentrations of VEGF did not predict **L**. **PL** from d 65 to term decreased as concentrations of VEGF on d 45 increased ($P < 0.05$). It is concluded that a threshold concentration of maternal progesterone is necessary for maintenance of pregnancy and that survival of individuals within a litter may be related to a role of VEGF in placentation.