

LAPAROSCOPIC ARTIFICIAL INSEMINATION ALTERS SERUM PROSTAGLANDIN LEVELS IN EWES

T.T. Thompson, M.D. Hardy, A.T. Peter

Department of Veterinary Clinical Sciences, School of Veterinary Medicine,
Purdue University, West Lafayette, IN 47907, USA

The use of frozen semen and intrauterine laparoscopic artificial insemination (LAI) offers a unique opportunity to sheep producers to more rapidly improve the genetic basis of a flock. However, this rapid progress depends on efficient procedural techniques and consistent conception rates. Proper insemination timing relative to ovulation, quality of the semen, experience of the inseminator, and limited damage to the endometrium during the procedure dictate the overall success. Trauma to the endometrium during the procedure can result in the release of various prostaglandins that may influence fertility. Hitherto, no studies have been undertaken to determine the amount and relative effects of the prostaglandins released from the endometrium due to laparoscopic procedure. The purpose of this observational study was to determine the amount of prostaglandin $F_{2\alpha}$ ($PGF_{2\alpha}$) and prostaglandin E (PGE) released following the laparoscopic procedure. Nine ewes were used, divided in two groups, natural service (NS; $n = 64$) and LAI ($n = 65$). The ewes were synchronized with intravaginal progesterone sponges, placed for 14 days, followed by an intramuscular injection of eCG (500 IU) given at the time of sponge removal. LAI was performed 54 h post-sponge removal. In the LAI group, on day one or the day of insemination, two blood samples were collected, pre- and post-LAI, followed by one daily sample on days two, three, and five. The timing of blood sample collection from the NS group was the same except that only one blood sample was collected on day one. The amount of $PGF_{2\alpha}$ and PGE in the serum was determined by ELISA.

There was a marked increase in mean $PGF_{2\alpha}$ concentrations in the LAI group between the pre and post-procedural samples (32.3–171.3 pg/ml). There was minimal change in mean $PGF_{2\alpha}$ concentration in the NS group (25.6–32.4 pg/ml) between days one and two. Although the increase in the LAI group was significant ($P < 0.05$), the differences between the LAI and NS groups was not ($P > 0.05$). The mean PGE concentration did not change significantly in either group LAI or NS (6.1–8.4 pg/ml in LAI, and 7.2–8.4 pg/ml in NS). This preliminary study suggests that LAI procedure can result in marked release in $PGF_{2\alpha}$ from the endometrium as determined by serum $PGF_{2\alpha}$ concentrations. However, this increase was transient in nature. These findings merit further studies with a larger sample size, to determine the relationship, if any, between the increases in $PGF_{2\alpha}$ concentrations in the LAI group to conception and lambing rates.

Project supported in part by funds from the Department of Veterinary Clinical Sciences.

Keywords: Ewes; Laparoscopy; Artificial insemination; Natural service; Prostaglandins