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Title of thesis: Evaluation of some serum biochemical parameters before and after laparoscopic artificial insemination in Sheep

SUMMARY

Laparoscopy is a minimally invasive surgical method used for the diagnosis and treatment of various diseases in the abdomen. This surgical technique has gained popularity in recent years due to numerous advantages over traditional open surgery. Laparoscopic intrauterine insemination has been performed in sheep since the 1980s, and it serves as a preferred method for artificial insemination due to the limited efficacy of frozen sperm insemination through the cervix. Additionally, intrauterine insemination allows for a higher fertility rate compared to cervical insemination, even with fresh semen. The present study aimed to evaluate some biochemical parameters in the serum before and after artificial insemination by laparoscopy in sheep.

In this study, 30 clinically healthy adult Maku breed ewes were utilized. All ewes were simultaneously inseminated with sponge removal containing medroxyprogesterone acetate within a time interval of 56 to 60 hours. Blood samples were collected from the jugular vein of each sheep 24 hours before the procedure, one-hour post-procedure, 24 hours post-procedure, and one week post-laparoscopic insemination for serum separation. The determination of the oxidant/antioxidant status involved measuring total antioxidant capacity, total oxidant capacity, and malondialdehyde (MDA) concentration using commercial kits.

Significant increases were observed in the total bilirubin concentration at 6 and 24-hours post-laparoscopy ($P < 0.05$). A significant decrease in total protein concentration was observed 24 hours post-procedure (0.50 ± 5.12 mg/dL; $P < 0.05$). Albumin concentration showed a significant decrease 24 hours post-procedure compared to pre-procedure levels ($P < 0.05$). A significant increase in serum AST and ALT enzyme activities was observed at six and 24 hours post-laparoscopic insemination ($P < 0.05$). The concentration of malondialdehyde in serum, as an indicator of free radical production, significantly increased in the initial measurements after the procedure (6 and 24 hours post-laparoscopy) compared to pre-procedure levels ($P < 0.05$).

Although the total antioxidant capacity increased at 6 hours post-procedure, a significant increase was observed during the 24 hours post-procedure compared to pre-procedure levels ($P < 0.05$). The results of the current research indicate that laparoscopic artificial insemination leads to oxidative stress conditions and a significant increase in transaminase levels during the 24 hours following the procedure. However, the elevation of oxidative stress markers and serum transaminase enzymes had no apparent clinical consequences on the health of the studied subjects post-procedure.

Keywords: Laparoscopic artificial insemination, biochemical parameters, oxidative stress, Sheep.