

Preliminary Results on the Effects of Vasectomy on Alkaline Phosphatase Levels in Seminal Plasma of Male Alpacas (*Vicuna Pacos*)

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Azoospermia is a common syndrome in male infertility in alpacas and is primarily due to spermatogenic arrest or bilateral epididymal blockage (congenital segmental aplasia or acquired sperm granuloma). In several species, alkaline phosphatase (AP) levels in seminal plasma have been used to differentiate azoospermia due to lack of spermatogenesis from bilateral epididymal blockage. The objective of this study was to determine if the only sources of AP in the alpaca ejaculate are the testes and epididymides. The hypothesis was that if only the testis and epididymis contribute AP to the ejaculate then samples collected by electroejaculation after vasectomy would contain significantly less AP than pre-vasectomy samples. Eight adult (2.5 to 7 year old) male alpacas were induced with ketamine HCl (4.0 mg/kg; IM), xylazine HCl (0.4 mg/kg; IM) and butorphanol tartrate (0.04 mg/kg; IM) and anesthesia was maintained with isoflurane in oxygen. Semen was collected by electroejaculation, after which bilateral vasectomy was performed. A 2 cm incision was made caudolateral to the prepuce over each ductus deferens, which was bluntly dissected, transected, and ligated. Animals received a dose of long-acting ceftiofur (6.6 mg/kg; SQ) (Excede®, Pfizer Animal Health, Charles City, IA, USA) and flunixin meglumine (1.1 mg/kg; SQ). Five weeks after vasectomy, electroejaculation under anesthesia was repeated. Seminal plasma AP concentration pre- and post-vasectomy were compared using the Statistix 8.0 software package (Analytical Software, Tallahassee, FL, USA) using a paired t-test with significance set at $p < 0.05$. The mean levels \pm SEM of AP in pre-vasectomy seminal plasma was 377.5 ± 213.3 U/L (range 20 to 1450); post-vasectomy was 82.75 ± 49.9 U/L (range 0 to 410). Six of the 8 males (75%) showed decreased AP concentration (0 to 30% of pre-vasectomy levels) in the ejaculate. The pre- and post-vasectomy AP mean \pm SEM for these 6 males was 467.7 ± 277.5 U/L and 23.7 ± 19.3 U/L, respectively. Urine contamination was present in 12.5% of pre-vasectomy ejaculates and 50% of post-vasectomy samples. Urine-contaminated samples contained semen as verified by phase-contrast microscopy. Although these preliminary results did not show a statistical difference, the data indicated that alpacas, like other species, produce AP from the testes and epididymides and that bilateral obstruction or aplasia results in lowers AP levels. The large variation in AP amongst males may be due to the technique of electroejaculation which produces variable degrees of stimulation. Another possible source of variation may be the interval between surgery and collection. Collection by artificial vagina or increasing the number of males and increasing the interval from vasectomy to collection could help better define these parameters.

Key words: Camelid; Andrology; Semen evaluation; Azoospermia