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SUPEROVULATION AND NON-SURGICAL EMBRYO FLUSHING IN INDIAN CAMEL (*Camelus dromedarius*)

S.Vyas, A.K. Singh, P.Goswami, U.K. Bissa, A.K. Rai and N.D. Khanna
National Research Centre on Camel, P.O. Bag No. 07, Bikaner- 334 001, India

Abstract
The embryo transfer technology which offers rapid exploitation of genetic potential of superior female has not been standardized in the Indian dromedary. Preliminary trials were conducted for developing embryo transfer technology in Indian camels. The donor she camels were examined by ultrasound for the presence of dominant follicle in ovaries. Various protocols were attempted for superovulation. The two-way long Foley's catheter (26", 18 Fr, 30 C>C.) was used for embryo flushing. The air bulb of catheter was fixed just inside the uterine body to flush both horns simultaneously. DPBS (1.5-2 litres) was used for flushing in about 12 to 14 releases. The media recovered was filtered through EmCon filter and filtrate was searched under stereozoom microscope for embryos. A total of seven embryos were collected out of eight superovulatory treatments. One good quality morula was transferred in recipient.

Introduction

The use of embryo transfer technology to improve the reproductive efficiency in camel has been emphasized by Yagil and Creveld (1990) and has been attempted in Arabian camel (Annouassi et al., 1990; Skidmore et al., 1992; Mckinon and Tinson, 1992). This paper presents the results of preliminary experiments designed to develop embryo transfer technology in Indian Camel.

Materials and Methods

A total of 14 adult she camels (aged 8-12 yr.) belonging to herd of National Research Centre on Camel, Bikaner were utilized in the present study. These animals were divided into four groups as under:

Group 1: eCG with progesterone priming (two donors) 100 mg progesterone in oil (Duraprogen, Unichem Laboratories, Bombay) was injected daily to the donors for 7 days. It was followed by 3000 i.u. eCG (Trophovet), Indian Immunologicals, Hydrabad, India) on 8^{th} day. The ovaries were scanned by endovaginal sector probe (5 MHz) of Scanner-200 (Pie-medicals, Netherland). The donors were mated when follicles attained diameter between 1.5-2.0 cm.

Group 2: Mating without progesterone priming (two donors). Donors having follicle of 1.5-2.0 cm were mated without progesterone priming.

Group 3: eCG without progesterone priming (two donors). Donors were given 3000 i.u. of eCG without considering the presence of follicle in ovaries.

Group 4: Induced luteal phase prior to superovulatory treatment (eight donors). Donors were scanned for presence of follicle measuring 1.0-2.0 cm and administered hCG (Profasi, Serono India) 3000i.u. for ovulation. Then on day 8-9 FSH-P 50 mg (Schering-

Plough Animal Health Corporation, USA) was administered in decreasing twice daily divided doses for a period of 4-5 days. The ovaries were scanned for dominant follicle and then mated with a known reproductive efficient male. The experimental female was injected hCG 3000 i.u. after mating.

Management of recipients: The recipient she camels after assessing the presence of follicle I1.5-2.0 cm) were given inj. hCG 3000 i.u. one day after the mating of donor.

Embryo collection: Embryo collection and embryo recovery in Indian camel was attempted by non-surgical method. The donor camels were restrained after adminstration of xylazine 100-140 mg i.v. in sitting posture on an inclined plane ($20\text{-}30^0$) so that hind quarters were on lower side. After evacuation of rectum, 6 ml of 2% Xylocaine was administered in scrococcygeal joint for epidural anesthesia. The two-way long Foley's catheter (26', 18Fr, 30 c.c.) was used for embryo flushing. The uterine horns in camels are almost T-shaped, therefore both horns were flushed simultaneously by fixing the airbulb just inside the uterine body. One to 1.5 litres of modified DPBS (GIBCO-BRL, USA) was used for flushing in about 15-20 releases depending on the size of the uterine horns. About 90-95 % of the infused media was recovered and passed through the Em Con embryo filter (Immunosystems Inc. Wisconsin, USA). The filtrate was searched under a stereozoom microscope (SMZ-U, Nikkon, Japan).

Embryo transfer: The embryos were transferred non-surgically. Good quality embryo was loaded into a 0.25 ml embryo straw (I.M.V, France) as described by Elsdein and Seidel (1990). The straws were loaded into special Embryo transfer gun and sheath (I.M.V. France). After covering a protective sleeve the gun was entered in the vagina of the recipient camel and guided by right hand of the operator up to the external os of the cervix through the posterior folds of the vaginal mucosa. Then the protective sheath was withdrawn and the catheter was guided with the left hand of the operator (inside the rectum) into the left horn.

Results and Discussion

Group1: The response to superovulatory treatment as assessed by presence of multiple follicles in ovaries was good. But the fluid recovered through uterine flushing was highly turbid and opaque rendering embryo searching under stereozoom microscope very non-pathogenic. Similar findings were reported by Anouassi and Ali (1990),but not by McKinon and Tinson (1992) who used the same protocol.

Group 2: It was felt that high levels of progesterone may be the cause of turbidity in uterine fluid. So the donors in group-2 were mated without progesterone priming. The fluid recovered from uterine flushing was transparent and devoid of turbidity.

Group 3: In this group, the eCG was administered without progesterone priming. The ovarian response was poor. Only one follicle of mature size (1.8 cm) was present in one animal. The fluid recovered after flushing was free from turbidity. However, no embryo could be found.

Group 4: In this group the progesterone released by the C.L. formed after the induced ovulation primed the ovary for growth and maturation of multiple follicles. This protocol was used in eight she camels. A total of seven embryos were recovered and good quality morula was transferred in a synchronized recipient she camel. The recipient camels were monitored regularly and it was observed that although embryos were successfully

transferred, it did not result in full term pregnancy. Further work on perfecting the embryo transfer technology is in progress.

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References

Annouassi, A. and Ali, A. (1970). Embryo transfer in the camel (Camel dromedarius). Is it possible to improve reproductive performance of the camel?" Proc. UCDEC Workshop, Paris.

Elsdein, R.P. and Seidel, G.E. (1990). Procedures for recovery, bisection, freezing and transfer of bovine embryo. Animal Reproduction and Biotechnology, laboratory Bulletin No. 2, Colorado State University.

Mckinnon, A.O. and Tinson, A.H. (1992). Embryo transfer in dromedary camels. Proc. 1st International camel Conference, Dubai pp. 137-142.

Skidmore, J.A., Allen, W.R., Cooper, M.J., Chaudhary, M.A. and billah, A.M., 1992. The recovery and transfer of embryos in the dromedary camel: results of preliminary experiments. In: Allen, W.R., Higgins, A.J., Mayhew, I.J., Snow, D. and Wade, JF (eds) Proceedings of 1st International Camel conference, Dubai. (R&W Publications, Newmarket, UK), 137-142.

Yagil, R. and Von Creveld C. (1990). Embryo transfer technology in camels (Camelus dromedaries). Why and how? Is it possible to improve the reproductive eprformance of the camel? Proc. UCDEC Workshop, Paris.