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Brief Communication

EFFECT OF PROSTAGLANDIN $F_{2\alpha}$ ON SPERM TRANSPORT IN THE REPRODUCTIVE TRACT OF THE EWE

Cervical deposition of frozen-thawed ram semen has yielded unsatisfactory pregnancy results for reasons not well understood. However, normal fertilization rate was obtained when frozen-thawed semen was deposited directly into the uterus (e.g. *Andersen et al.* 1973) which suggests that insufficient sperm transport might be an important factor.

In the rabbit and the monkey prostaglandins promote sperm transport to the oviducts (*Mandl* 1972, *Jaszczak & Moghissi* 1974). Fresh ram semen is rich in prostaglandins (e.g. *Eliasson* 1959, *Bygdeman & Holmberg* 1966) and therefore it seemed useful to study the effect of prostaglandin on the distribution of frozen-thawed spermatozoa in the genital tract of ewes. In a preliminary investigation it was demonstrated that $PGF_{2\alpha}$*, administered intramuscularly, stimulated the contractibility of the genital tract of ewes in vivo (*Edqvist et al.*, to be published). Moreover studies recently performed at the University of Minnesota (*Crabo et al.*, to be published) showed that $PGF_{2\alpha}$ could be added to ram semen before freezing or after thawing in relatively high concentrations without any detrimental effect on sperm survival or sperm morphology.

Twenty-four adult ewes of Swedish Landrace Breed were used. About 24 hrs. after the onset of their second or third heat the ewes were inseminated with 0.25 ml frozen-thawed semen containing 300×10^6 spermatozoa. The semen derived from one ram, and the method of split ejaculate was used. The extender was $TesNaK_2$ (*Graham et al.* 1972) containing 20 % egg yolk and 5 % isotonic glucose solution and 5 % glycerol. The semen was diluted 1:3, cooled and frozen to pellets. To one third of the ejaculate was added 300 µg $PGF_{2\alpha}$ per ml diluted semen about 5 min. before freezing. Thawing was done on a warm plate (40°C) just prior to insemination. Eight ewes were inseminated with

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* The prostaglandin $F_{2\alpha}$ was kindly supplied by the Upjohn Company, Kalamazoo, USA.

Table 1. The number of spermatozoa ($\times 10^3$) recovered from the reproductive tract of ewes 24 hrs. after insemination.

Controls					$PGF_{2\alpha}$ added to the semen					$PGF_{2\alpha}$ i.m.				
Ewe no.	Number of spermatozoa				Ewe no.	Number of spermatozoa				Ewe no.	Number of spermatozoa			
	oviducts	UTJ	uterus	cervix		oviducts	UTJ	uterus	cervix		oviducts	UTJ	uterus	cervix
1	1.6	0.4	0	0	9	97.0	14.4	17.0	17.7	17	51.1	3.5	185.1	20.7
2	0.5	0	8.3	0	10	4.0	1.5	2.7	18.8	18	8.0	0.7	1.1	9.9
3	0.4	3.2	7.6	6.8	11	3.3	4.0	1.6	0	19	6.9	2.1	0	0.7
4	0.3	0.5	0	0	12	3.2	0.2	4.0	0	20	4.5	0	6.6	3.5
5	0.2	0.2	0	0	13	2.6	0.4	14.2	24.3	21	3.2	0.5	2.1	0
6	0	0.4	0	0	14	0.6	0	4.9	0	22	2.6	0.3	58.9	5.9
7	0	0.3	0	0	15	0.2	0.4	0	0	23	1.9	0.3	10.8	34.4
8	0	0	0	45.1	16	0.1	0	7.0	0	24	1.8	0.2	3.1	4.9
Mean	0.4	0.6	2.0	6.5	Mean	13.9	2.6	6.4	7.6	Mean	10.0	1.0	33.5	10.0

semen to which $PGF_{2\alpha}$ had been added, eight ewes received 2.5 mg $PGF_{2\alpha}$ i.m. 10 min. after the insemination with unsupplemented semen. The remaining eight ewes served as controls. The frozen-thawed semen was deposited in posterior cervix in all ewes. Twenty-four hrs. after insemination the ewes were slaughtered and the reproductive tracts removed. Clamps were placed dividing the tubular tract into cervix, uterine horns, uterotubal junction (UTJ) and oviducts. Each segment of the tract was flushed with saline solution and the number of spermatozoa in the flushings was counted in a haemocytometer.

As can be seen from Table 1 the average number of spermatozoa recovered from uterus and from the oviducts was considerably higher in the test groups than in the control group. The sperm number recovered from the oviducts of the control group agrees rather well with corresponding figures for deep frozen semen reported by *Lightfoot & Salamon* (1970). The number recovered from the oviducts of the test groups are of the same magnitude as those reported by *Lightfoot & Salamon* 24 hrs. after insemination with fresh semen. The wide variation of the number of recovered spermatozoa from the oviducts in the group inseminated with $PGF_{2\alpha}$ supplemented semen is difficult to interpret but could be related to the low dose of $PGF_{2\alpha}$. In conclusion the present results showed that $PGF_{2\alpha}$ remarkably increased the transport of frozen-thawed spermatozoa from posterior cervix to the oviducts. One prerequisite for a normal fertilization rate has therefore been achieved.

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