

OVARIAN MASS, SIZE AND NUMBER OF FOLLICLES IN POSTPARTURIENT EWES

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Abstract

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The aim of this study was to follow in more detail changes of the ovaries during physiological puerperium in ewes. Twenty Slovak Merino ewes aged 3-5 yr and lambed in February were included in the experiment. The groups of animals were slaughtered ($n = 5$) on d 1, 7, 17 and 24 postpartum. Their reproductive apparatus was excised immediately after slaughter, their ovaries were identified as ipsilateral at the pregnant uterine horn, and contralateral at the non-pregnant horn. All ovaries were weighed, and size and numbers of follicles were evaluated on the ovarian surface. Mass of contralateral ovaries ranged from 0.686 ± 0.24 to 0.985 ± 0.32 g and mass of ipsilateral ones from 0.935 ± 0.21 to 1.025 ± 0.45 g. However, none of the changes in ovarian mass were significant. Only small structures were observed on d 1 and 7 postpartum when evaluating follicle size. Highest number of follicles in both ovaries was found on d 17 after parturition. These data provide further information on postparturient involutinal and reparative processes of the reproductive apparatus in ewes.

Involution, postpartum, ovary, mass follicle

The ovaries are the primary target organ of reproduction apparatus in the gonadotropic hypothalamo-hypophyseal regulation of the reproductive cycle. Their morphological changes are dependent on the number of developing follicles with subsequent development of individual stages of the corpus luteum at the time of reproductive cycle, pregnancy, puerperium and lactation. The weight range for the sheep ovary reported by Hafez (1974), McDonald (1980) is very variable and depends on the age of animals, breed, season, application of hormonal preparations (Kudláč and Vlček 1970; Whyman and Moore 1980; Krajničáková et al. 1992) and other factors acting during the whole reproductive cycle.

Literary studies about changes in the ovarian mass in postpartum of sheep are only sporadic. A decrease in the ovarian mass by 26 % was recorded by Burou (1982) on d 7 after lambing. A non-significant decrease in mass of ovaries up to d 7 postpartum was reported by Krajničáková et al. (1990) and Krajničáková et al. (1991) on d 7 postpartum. However, the mass of the ipsilateral ovary tended to surpass that of the contralateral ovary during the experimental period.

Observation concerning the inhibitory effect on the follicle growth from d 140 of pregnancy to d 5 postpartum showed that the corpus luteum of the late pregnancy has a stimulating effect on development of the ovarian follicles during this period (Alguory and Martinet 1986).

Based upon the above-mentioned facts, the aim of our work was to determine the ovarian mass, size and number of follicles in ewes during observed intervals postpartum (p.p.).

Materials and Methods

Twenty sheep aged 3-5 yr were used in the experiment. All animals lambed in February. They were slaughtered on d 1, 7, 17 and 24 postpartum (n=5). The reproductive organs were excised immediately after slaughter, and the mass of ovaries was determined using an analytical balance. Before evaluation, the ovaries were divided into the ipsilateral at the pregnant uterine horn, and contralateral ones at the non-pregnant horn. The size of follicles was measured using a micrometer dial calliper. After the mass of ovaries, size and number of follicles were determined, the ovaries were fixed for further histological examination. Statistical significance of ovarian mass was compared to that found on d 1 postpartum. Student's t-test was used for calculation.

Results

The results of our study are shown in Table 1. The mass of ipsilateral ovaries on d 1 and 7 postpartum ranged from 0.935 ± 0.21 to 0.958 ± 0.15 g. In the remaining days of the experiment it slightly increased.

The mean mass of contralateral ovaries was lower in comparison with that of ipsilateral ones and it ranged from 0.686 ± 0.24 to 0.669 ± 0.16 g on d 1 and 7 post partum.

The observed mean mass, i.e. 0.985 ± 0.32 g on d 17 postpartum was similar to mean mass of ipsilateral ovaries on d 7 postpartum.

Numbers and sizes of follicles are presented in Table 1, too. Follicles were divided into three groups with 2 mm, 4 mm and 5 mm in diameter. A certain stagnation of follicle growth was observed on d 1 and 7 postpartum. In addition, small structures and remains of corpus luteum were observed on the ovarian surface on the same days.

Evaluating the number and size of follicles on d 17 postpartum, 7 follicles were found on each ovary. On the ipsilateral ovary, 4 follicles were 2 mm in diameter, and 3 follicles had 4 mm. On contralateral ovary 3 follicles attained the size of 2 mm, 1 follicle 4 mm and 3 follicles was 5 mm in size.

On d 24 postpartum, 4 follicles were observed on the ipsilateral ovary. Three of them were 2 mm in diameter, and 1 follicle attained 5 mm. Three follicles were present on the contralateral ovary, 2 of them were 2 mm large and 1 was 5 mm. Neither ovulation occurred nor corpus luteum was detected during the whole period of experiment. None of the changes in ovarian mass were significant at any of the postpartal days studied.

Table 1
The ovarian mass, size and number of follicles in postparturient ewes

Day after parturition	Number of animals	Ovaries mass (g)	Ipsilateral number of follicles			SS
			(2mm)	(4mm)	(5mm)	
1	5	0.935 ± 0.21	-	-	-	14
7	5	0.958 ± 0.15	-	-	-	28
17	5	1.025 ± 0.45	4	3	-	22
24	5	1.024 ± 0.28	3	-	1	15
		Ovaries mass (g)	Contralateral number of follicles			SS
			(2mm)	(4mm)	(5mm)	
		0.686 ± 0.24	-	-	-	16
		0.669 ± 0.16	-	-	-	23
		0.985 ± 0.32	3	1	3	20
		0.890 ± 0.20	-	2	1	14

SS - small structures

Discussion

The mass of the contralateral ovary was found to be non-significantly lower compared to that of the ipsilateral one after lambing. A decrease in the mass of the contralateral ovaries up to d 7 after lambing is comparable with the data by Burov (1982) who reported a 26 % decrease in the weight on the same day. If we consider that this variable is influenced by the number and size of follicles present on the ovary, then the ovarian mass found on d 17 and 24 postpartum supports this conclusion.

Changes in the ovarian mass at the intervals employed in our study support indirectly the findings on the lowest concentrations of progesterone in the blood serum of sheep (Greyling and Van Derwesthuysen 1979; Krajničáková et al. 1994, 1995) as well as on higher levels of 17-beta estradiol and androgens, which are the symptoms of the follicular growth.

In the postparturient period, the follicles develop and grow to maturity, reaching the ovulation stage, or they become atretic, and disappear. Our results showed that during the first days after lambing the follicular growth was rather slow. Similar results obtained at the beginning of puerperium were reported by Dufour and Roy (1983). The interval from parturition to d 7 postpartum is short and insufficient for the growth and development of preantral follicles. This may be connected with the previous pregnancy as reported by Algubory and Martinet (1986). The number of follicles found on d 17 and 24 of our observation (Table 1) is comparable with findings of Dailey et al. (1982).

The results of our study extend the observation period for postparturient ovarian and follicular changes to the first month during which the involutinal and reparative changes of the reproductive apparatus take place.

Hmotnosť vaječníkov, počet a veľkosť folikulov u oviec po pôrode

Cieľom tejto práce bolo rozšíriť sledovanie hmotnosti vaječníkov, počet a veľkosť povrchových folikulov oviec pri fyziologickom priebehu puerpéria. Do experimentu bolo zaradených 20 bahníc plemena Slovenské merino vo veku 3-5 rokov, ktoré sa obahnili vo februári. Zvieratá sme odporážali ($n = 5$) v 1., 7., 17. a 24. deň po pôrode. Bezprostredne po vykrvení sme ovciam excidovali pohlavný aparát a zisťovali hmotnosť vaječníkov. Vaječníky sme pred posúdením rozdelili na ipsi- a kontralaterálne. Na povrchu vaječníkov sme posudzovali veľkosť i počty folikulov. Hmotnosť kontralaterálnych vaječníkov sa pohybovala v sledovanom období od $0,686 \pm 0,24$ do $0,985 \pm 0,32$ g a hmotnosť ipsilaterálnych od $0,935 \pm 0,21$ do $1,025 \pm 0,45$ g. Pri hodnotení veľkosti folikulov, rozdelených do 3 skupín, sme v 1. a 7. dni po pôrode zaznamenali iba drobné štruktúry. V 17. dni sme pozorovali 7 folikulov na obidvoch vaječníkoch. Naše výsledky rozširujú poznatky o involučných a reparačných procesoch na ováriách oviec v prvom mesiaci po pôrode.

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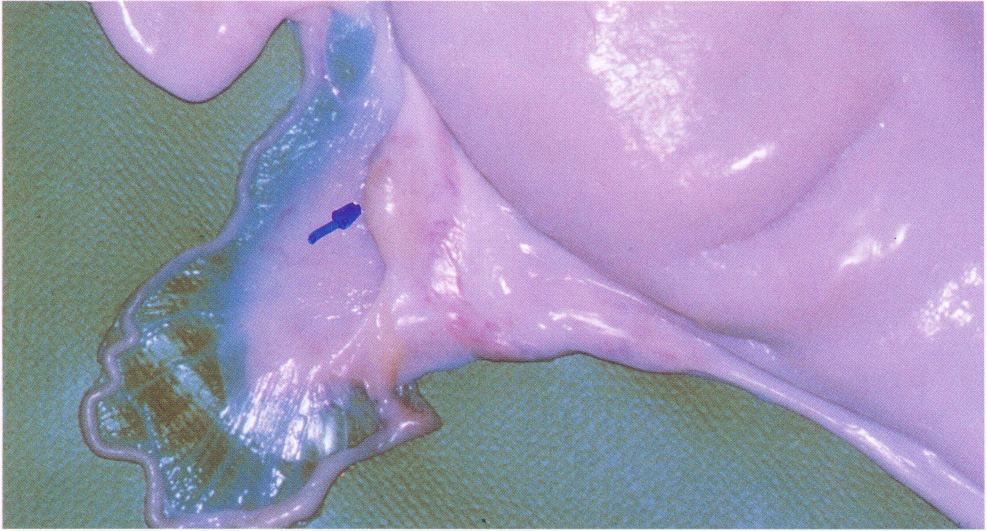


Fig. 1. The ovary of the ewe on d 7 p. p. There are small structures of pinhead size on its surface.

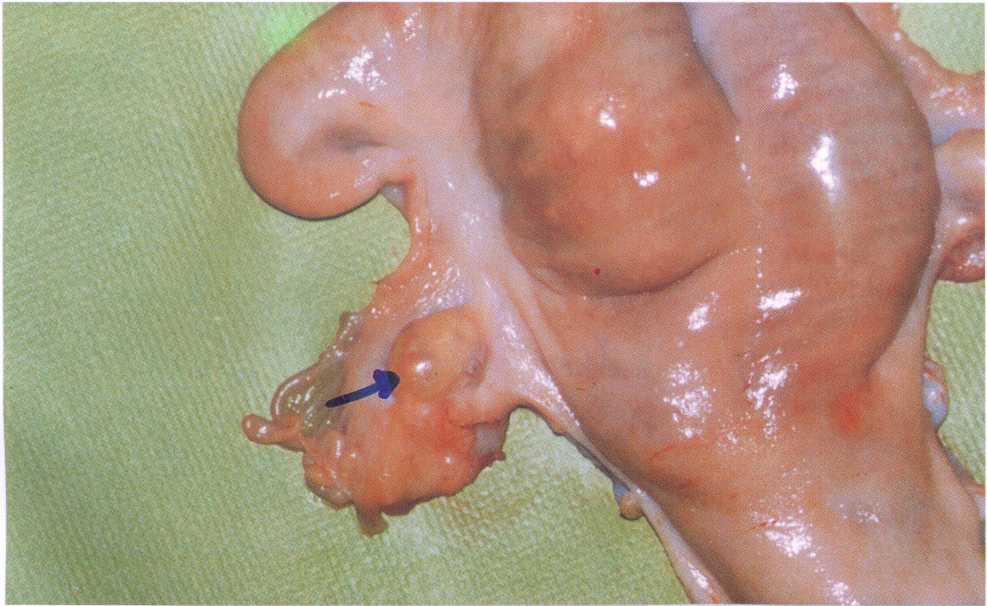


Fig. 2. The ipsilateral ovary of the hazelnut shape with occurrence of follicles larger than 4 and 2 mm on d 17 p. p.