termediate periods of ES. The material substrate of oliguria is related to prolonged micropinocytosis, which causes long-term reabsorption in the distal part of the nephron.

After 3 days, at the late stage of endotoxemia, numerous neurosecretory granules are seen in the posterior lobe of the pituitary gland (Fig. 3, *a*). There are no ultrastructural features of the endothelium pointing to a state of high permeability for ADH. Such neurosecretory events are in agreement with the ultrastructural state of the renal epithelium. There are no micropinocytic vesicles, and consequently the process of transepithelial pinocytosis is leveled (Fig. 3, *b, c*).

Thus, the ultrastructural changes developing during endotoxemia reveal the reciprocal relationships in the hypothalamo-hypophyseal-renal system. Renal function is dependent on the state of the higher regulatory centers. In the process of ES, distal reabsorption is reduced and neurosecretion is affected according to the feedback principle. The appearance of numerous pinocytic vesicles in the initial and intermediate periods of ES points to a marked increase of facultative reabsorption and is an element of acute renal insufficiency. The disappearance of the vesicles in late endotoxemia is evidence of the restoration of water homeostasis.

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Morphofunctional Features of an Ovary Left after Unilateral Oophorectomy in Various Cycle Phases and in Pregnancy

B. Ya. Ryzhavskii, V. M. Karatun, and N. B. Murzina

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It was previously shown that the progeny of unilaterally oophorectomized rats have increased brain mass at the age of 5 days [4] and later differ from the control in the parameters of the sex and lymphoid organs [5,6]. One may suppose that changes in the ovary left after removal of the paired organ contribute to the origin of these deviations, the endocrine functions of the ovary being an important factor de-

Histology Department of the Central Research Laboratory, Khabarovsk Medical Institute. (Presented by M. T. Lutsenko, Member of the Russian Academy of Medical Sciences)

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TABLE 1. Effect of Unilateral Oophorectomy on Morphometric Characteristics of Remaining Ovary, Nimber of Fetuses, and Fetal and Placental Mass ($M \pm m$)

Group		Ovarian mass, mg	Corpora lutea mass, mg	Follicular mass, mg	Atratic body mass, mg	Number of fetuses	Fetal mass, g	Placental mass, mg
Diestrus	Experiment	47.5±3.1 (130.6)*	19.7±2.6*	4.8±1.3	2.8±0.5	–	–	–
	Control	36.3±3.9	10.1±2.7	3.6±0.8	2.7±0.5	–	–	–
Estrus	Experiment	61±4.4 (155.6)*	16.5±3.7	8.7±1.6*	2.9±1.0	–	–	–
	Control	39.2±2.9*	15.2±1.9	2.4±0.4	2.1±0.4	–	–	–
Gestation day 8	Experiment	52.8±3.1 (184.6)*	23.3±3.8*	9.0±2.3	3.3±0.6*	8.7±2.2	–	–
	Control	28.6±1.5	12.4±0.6	4.1±0.9	1.7±0.4	12.4±0.7	–	–
Gestation day 20	Experiment	86.7±2.4 (171.3)*	58.7±3.1*	3.9±1.0	1.8±0.5	9.1±0.4*	3.1±0.1	611±28.9*
	Control	50.6±5.5	31.3±3.9	2.6±0.7	1.3±0.1	12.3±0.1	3.1±0.1	522±31.5

Note: in parentheses % vs. control; asterisk shows values with $p<0.05$ vs. control.

termining the embryogenesis conditions of the progeny and their postnatal development pattern. Studies of ovarian morphology after unilateral oophorectomy have focused on the time course of compensatory hypertrophy and signs of accelerated aging of the remaining organ [3]. At the same time, we failed to detect specific morphofunctional features of the ovaries of hemioophorectomized rats during pregnancy, that is, during the realization of the most important function of the ovary, namely participation in the hormonal regulation of the embryonal development of the progeny.

We studied the ovaries from rats killed 1.5 months after unilateral oophorectomy. Such a period was chosen because theprogeny of animals mated 1.5 months after surgery differed from the controls as mentioned above.

MATERIALS AND METHODS

Outbred female white rats unilaterally oophorectomized at the age of 3 months were used in the experiments [2]. The ovaries of 68 rats decapitated 1.5-2 months after unilateral oophorectomy during diestrus, estrus, and on days 8 and 20 of gestation were examined. The ovaries of 52 intact rats decapitated in the same cycle phases and pregnancy terms were examined as controls simultaneously with the experimental animals. Ovarian mass was measured in all animals, and in the pregnant animals placental mass and the nimber and weight of fetuses were estimated. The activity of 3β-ol-steroid dehydrogenase (StDH) was measured in central sections [8]. The intensity of the reaction in the corpora lutea, cavitary follicle theca, atretic bodies, and interstitial tissue was measured cytophotometrically. The volumetric densities of the above steroid-producing structures were determined and their mass per ovary extimated [1]. The plasma progesterone concentrations were radioimmunoassayed.

RESULTS

The ovary left after unilateral oophorectomy was found to be enlarged during all periods of examination; this enlargement was greatest on gestation day 8 (184.6% vs. the control) (Table 1). The experimental animals' corpora lutea counts were higher than in the controls, almost twofold higher during diestrus and pregnancy; that is, the mass of these structures, which play a particularly important role in pregnancy, approached the values of two gonads of intact rats. The total mass of the cavitary follicles of unilaterally oophorectomized rats during diestrus was much higher than that of the controls, this corresponding to other workers' data on elevated concentrations of follicle-stimulationg hormone (FSH) after the removal of a single ovary or of both ovaries [10,11].

Differences in follicular mass during diestrus may be explained by the folllowing: in health increased estradiol production during this phase leads to a reduction of cavitary nondominant follicle gonadotropic stimulation [7], whereas in experimental animals it is in diestrus that more than a twofold reduction of StDH activity is found in the estrogen-secreting structures - follicles and atretic bodies (Table 2); this may result in a compensatory increase of FSH secretion [10] and the detected increase of cavitary follicle mass increment characteristic of unilaterally oophorectomized animals.

TABLE 2. StDH Activity in Ovarian Structures (in Conventional Units) and Blood Progesterone Concentration (in nM) of Oophorectomized and Intact Rats ($M \pm m$)

Group		Corpus luteus		Follicular theca	Atretic bodies	Interstitial tissue	Progesterone content
		periphery	center				
Diestrus	Experiment	285.3±23.9*	289.3±33.3	76.3±19.3	150.0±38.8	80.7±19.8	37.7±4.4
	Control	203.6±15.1	205.5±31.7	64.2±27.6	144.3±50.0	106.3±32.8	45.8±7.6
Estrus	Experiment	247.9±18.2	240.5±22.1	62.8±16.0*	70.9±11.8*	76.4±20.2	33.8±2.8
	Control	303.8±33.2	295.4±29.1	130.1±18.2	182.2±24.1	120.6±16.5	35.7±5.9
Gestation day 8	Experiment	273.0±29.8	286.7±28.3	83.0±19.2	134.0±18.0	125.0±24.5	68.7±5.1
	Control	267.7±42.6	299.7±40.4	57.0±20.4	128.2±27.9	96.2±35.4	79.9±13.3
Gestation day 20	Experiment	306.0±43.0*	315.9±43.4*	156.3±52.9	132.5±17.6	168.0±32.6	82.7±7.5
	Control	482.5±27.1	466.3±31.7	122.0±18.7	180.1±32.4	156.9±20.9	104.7±12.7

During diestrus the intensity of the reaction was hogher in the experimental animals' corpora lutea than in the controls, whereas on gestation day 20 it was lowered as against the controls (63.4% of the control value at the periphery and 67.7% at the center). During other periods examined no differences were detected in ovarian StDH activity of thecocytes, luteocytes, or atretic body cells of the compared groups. No reliable intergroup differences were found in the interstitial tissue reaction intensity during any of the tested periods (Table 2). It may be assumed that since each of the examined steroid-producing structures secretes mainly certain sex hormines [7,9], a nonuniform pattern of changes in steroidogenesis key enzyme activity in these hormones indicates a changed ratio of the hormones produced by the organism, which differ during various cycle phases and different pregnancy terms.

The progesterone concentrations were highest in rats of both groups on gestation day 20; they were somewhat lower in the experimental animals in comparison with the controls, but these differences were negligible (Table 2). The absence of significant shifts in these concentrations, despite the reduced ovarian tissue and corpora lutea mass and changed StDH activity, may be explained by a relationship between hormone level and not only the rate of its ovarian synthesis but also the rate of disintegration, elimination, and placental production [9].

This study of the reproductive function of unilaterally oophorectomized rats has shown the development of fetuses in only ine uterine horn, on the side where the ovary was left, the nimber of fetuses constituting approximately 75% of that in controls. The reproductive "load" of the single ovary and single uterine horn was therefore 1.5 times higher than that of intact animals. the mass of 20-day-old fetuses was the same in the compared groups, and the placental mass of the experimental animals was 17% higher than that of the controls.

Hence, morphological and functional changes develop in the ovaries 1.5-2 months after unilateral oophorectomy; these changes are detectable in pregnancy as well. They may be regarded as factors which may influence fetal and placental development and indirectly the postnatal development of the organism, causing deviations detectable in the progeny of unilaterally oophorectomized rats [4-6].

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