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Survival of Deciduomata During Lactation in the Rat.

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Deciduomas may be produced in the lactating rat following irritation of the endometrium until the seventeenth day postpartum.¹ This endometrial sensitivity is possible inasmuch as in the rat ovulation occurs a few hours after parturition with resultant functional corpora lutea. The corpora elaborate progesterin which together with a small quantity of estrin make sensitization to decidual formation possible.² During pregnancy in the rat this sensitization of the endometrium is not prolonged³ even though the corpora are functional until term. Sensitivity persists longer during lactation than during pregnancy.⁴ Probably the estrogen level is considerably lower during lactation than during pregnancy inasmuch as mucification of the vagina is not notable while nursing. Also large quantities of estrogens given soon after ovulation inhibit sensitization.

With these considerations, the purpose of this study is to determine the duration of these growths produced at graded intervals through the lactation period. An understanding of the conditions pertaining to their survival is necessary to aid in the endocrinal interpretation of these and projected studies.

The existence of pregnancy was established in mature albino rats in some instances by finding the sperms in a vaginal smear, in others by abdominal palpation. They were then segregated in individual cages and the date of parturition recorded. The lactating mothers nursed the litters continually through the experimental period. At regular intervals during the lactation period from the fourth to the twenty-second day using ether anesthesia, a single horn of the uterus was perforated with a needle in such a manner as to insure multiple irritations to the endometrium at several levels. From 3 to 8 days following the operative stimulation of the endometrium, anestrus was determined by vaginal smear. The animals were then killed and the entire reproductive tract fixed in Bouin's fluid. Microscopic examination was used to determine the presence of deciduoma in all instances.

¹ Lyon, R. A., and Allen, W. M., *Am. J. Physiol.*, 1938, **122**, 624.

² Weichert, C. K., *Proc. Soc. Exp. Biol. and Med.*, 1928, **25**, 490.

³ Allen, W. M., *Anat. Rec.*, 1931, **48**, 65.

⁴ Long, J. A., and Evans, H. M., *Mem. Univ. Calif.*, 1922.

TABLE I.
Duration of Deciduomata Initiated During Lactation.

No. of Rats	(Postpartum) Day Stimulated	(Postpartum) Day Killed	Survival Time of Deciduomata (Days)
6	5	8-16	9
6	7	10-18	9
5	9	12-20	9
5	11	14-20	8
4	13	16-22	7
5	15	18-22	5
5	17	21-23	4

Results. The period during which deciduomata may be produced by endometrial stimulation in the lactating rat extends from the fifth to the seventeenth postpartum day. The survival periods of the deciduomata, produced at graded intervals, are presented in Table I. In the initial half of lactation, these growths persist for about 9 days. During the latter part of the nursing period they involute sooner. Those produced at the seventeenth day start to involute almost as soon as they are formed.

It is interesting that toward the end of the lactation period, conditions are favorable for the initiation but not for the maintenance of the growths. Thus by the thirteenth day a fifth-day stimulated deciduoma will have involuted whereas the new thirteenth-day stimulation will be productive of a typical growth.

Early lactation period deciduomata disappeared prior to the occurrence of the first estrus by several days. However, the deciduomas produced later in lactation may disappear as a part of the pre-estrual changes. These considerations suggest that the estrogen level is so low that the growths do not obtain enough for continued growth. They are notably smaller than the corresponding pregnancy deciduomas during the presence of which enough estrogen is present to present mucification of the vaginal mucosa. The fact that they can be produced suggests that the minimal quantity of estrogen known to be present is adequate for the production of deciduomas of limited size.

Conclusions. Deciduomata have a limited survival period during lactation in the rat. Their duration tends to be shorter when produced after the eleventh postpartum day.