

Estrogen Content of the Blood at Four-Hour Intervals.*

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Several investigators have demonstrated that there is a periodic variation in the estrogen content of the blood of women at different stages of the menstrual cycle (Frank and Goldberger, Siebke, Mazer and Goldstein, Fluhmann and others). The methods of bioassay used by these authors, however, require such large amounts of blood that it has not been possible to use them for determining whether or not the concentration of the hormone remains constant during the course of each day.

The test employed in this study requires only a few cubic centimeters of whole blood and is based on the intravaginal application method first suggested by Berger¹ and Lyons and Templeton.^{2, ‡} Complete details of the procedure are reserved for a future communication, but it consists essentially of the introduction of small compressed pellets (40 to 80 mg) of whole blood, previously dried by dialysis,³ into the vagina of standardized adult spayed rats. Three animals were used for each dose level and the results were judged from vaginal smears made at 48 and 60 hours following the introduction of the pellets. The results are given in terms of biologic rat units.

This report is based on 4 subjects, one of whom was examined at 2 different stages of the menstrual cycle. Two were normal women, one complained of polymenorrhea, and the fourth had been operated upon 11 days before for an ectopic gestation. In each instance 5 specimens of blood were obtained at 4-hour intervals during the course of a 24-hour period and the estrogenic hormone content determined.

The results are given in Table I, and it is seen that although the

*Supported in part by the Rockefeller Fluid Research Fund of Stanford University School of Medicine.

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¹ Berger, M., *Klin. Wchnschr.*, 1935, **14**, 1601.

² Lyons, W. R., and Templeton, H. J., *PROC. SOC. EXP. BIOL. AND MED.*, 1936, **33**, 587.

‡ In our hands this method has proved sufficiently delicate to respond to one-tenth of the international standard of estrone dissolved in sesame oil.

³ Thalheimer, W., *PROC. SOC. EXP. BIOL. AND MED.*, 1938, **37**, 639.

TABLE I.

Patient	Day of cycle	Blood estrogen in rat units per 100 cc whole blood				
		8 a.m.	12 m.	4 p.m.	8 p.m.	Midnight
G	26	350	500	320	500	300
A	23	250	250	250	300	250
K	1	250	250	250	250	250
"	16	350	300	300	300	300
S	*	300	300	300	350	300

*Eleven days after operation for ectopic gestation.

amount of estrogen varied during the course of the day in 4 out of 5 cases, the difference may be considered as significant (over 150 rat units per 100 cc of whole blood) in only one instance. A difference of 50 units was observed on 3 occasions but it is doubtful that this change is of importance. There was no consistency in the time of day or night at which the rises occurred.

Summary. The estrogenic hormone content of the blood of women was determined at 4-hour intervals during the course of one day in 5 instances. A significant diurnal rise was noted once, a minor increase in 3 cases, and a constant level was found in one case.

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Concentration of Estrogenic Hormones in Blood Serum and Blood Cells.*

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Since the work of Kemp and Bjergaard¹ it has been accepted that the estrogens in the blood of pregnant women are about equally divided between the plasma and the cells. These assays, however, were conducted following chemical extraction, and a very different result has been found in non-pregnant individuals by using dried blood for direct examination.

In this study the serum and blood cells were separated by centrifugation and then dried by placing in cellophane tubes on which an

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¹ Kemp, T., and Bjergaard, K. P., *Compt. rend. Soc. de Biol.*, 1932, **111**, 329.