

INCREASE IN THE RNA CONCENTRATION IN RED BLOOD CELLS OF WOMEN DURING OVULATION

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The RNA concentration is increased (on the average by 58%) in the red blood cells of women during ovulation. A change in the RNA concentration in the red blood cells can be used as a test for ovulation.

KEY WORDS: RNA; red blood cells; ovulation.

Sex hormones have a considerable effect on RNA metabolism in man and animals. It was therefore decided to study the RNA concentration in the red blood cells of women at different stages of the menstrual cycle.

EXPERIMENTAL METHOD

Tests were carried out on 10 clinically healthy women aged 20-36 years with regular menstrual periods (24-32 days) and with a history of childbirth and abortion. The proliferative phase of the menstrual cycle was identified from the estrogen concentration in the blood plasma, the karyopycnotic index (60-80%), the pupil phenomenon, and the sign of stringiness of the mucus of the cervical canal. Normality of the lutein phase was established from the basal temperature and the plasma progesterone level. The occurrence of ovulation was judged from the peak of secretion of lutenizing hormone. Blood samples taken from the orbital vein were centrifuged and the red cells were twice washed with 10 volumes of 0.15 M NaCl with 1.5 mM

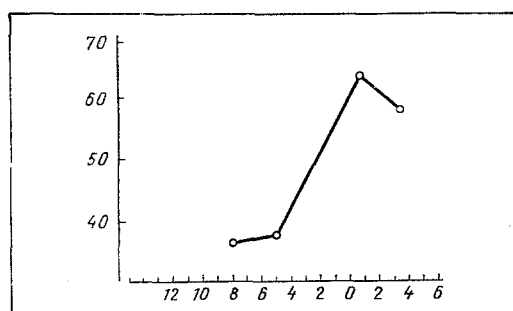


Fig. 1. RNA concentration in red blood cells of women during the menstrual cycle. Abscissa, days of menstrual cycle (0, day of ovulation); ordinate, RNA concentration (in mg/million cells).

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MgCl₂, pH 7.4; an equal volume of the same solution was added to the residue. The number of cells was counted (in millions/ μ l) in the suspension of red cells by the usual methods and the RNA concentration was determined [1]. The RNA content was calculated by the equation

$$C = \frac{3264 \cdot \Delta E_{270-290}}{n} \text{ mg/million}$$

where ΔE is the difference between optical densities at the corresponding wavelengths; n the number of red cells.

EXPERIMENTAL RESULTS

During the sixth to ninth and third to fifth days before ovulation the RNA concentration in the red blood cells of the women was 42.8 ± 2.2 and 39.0 ± 1.7 mg/million cells, respectively. During the period of ovulation it increased on average by 58% to reach 61.5 ± 1.2 mg/million cells (Fig. 1). The number of red cells was virtually unchanged at different phases of the cycle. The mechanism of the increase in RNA concentration in the red cells during ovulation remains unexplained, but this phenomenon can nevertheless be used as a test of the time of ovulation.

LITERATURE CITED

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