

# THE MECHANISM OF TERMINATION OF PREGNANCY BY ASCORBIC ACID

E. P. Samborskaya and T. D. Ferdman

UDC 618.39-085.3:577.164.2-092

One of the authors has previously shown [1-3] that large doses of ascorbic acid (AA) cause sexual disorders in guinea pigs, rats, and mice, which may result in the termination of pregnancy and in stillbirth. Termination of pregnancy by large doses of AA has also been observed in women.

The object of the present investigation was to study the mechanisms responsible for the sexual disturbances caused by AA and, in particular, to examine the role of the sex hormones in the termination of pregnancy.

## EXPERIMENTAL METHOD

Two series of investigations were carried out. In series I, the cytological picture of vaginal smears of albino rats was studied after the animals had received estrogens and large doses of AA to terminate pregnancy.

In series II the excretion of estrogens, pregnandiol, and 17-ketosteroids was determined in women taking large doses of AA in order to terminate pregnancy.

The experiments were carried out on sexually mature female albino rats with a mean weight of 180 g. An ordinary diet was given. Smears were stained by Papanicolaou's method. The animals were divided into three groups: the rats of group 1 (13) received an injection of folliculin in a dose of 25 i.u. per animal, dissolved in vegetable oil. The animals of group 2 (14) received AA, after preliminary neutralization, in a dose of 150 mg per animal. Both preparations were injected subcutaneously daily until the expected date of parturition or until the termination of pregnancy. The rats of group 3 (control, 17 animals) received subcutaneous injections of physiological saline.

To determine the effect of AA on the excretion of sex hormones in women, the compound was given in doses of 6 g daily for 3 days. The hormones in the urine were determined twice: once before administration of AA and again after the 3-day course. The excretion of the hormones was determined over a period of 24 h. The total estrogens were determined by Ingle's method, the pregnandiol by the method of Astwood and Johnson, as modified by Ordynets, and the 17-ketosteroids by Callow's method.

## EXPERIMENTAL RESULTS

Of the 13 animals receiving folliculin (group 1), pregnancy was interrupted in 11 (on 8th-11th day of pregnancy). Two females gave birth to normal offspring at full term. Of the 14 animals receiving AA (group 2), pregnancy was terminated in 3 (on the 13th-15th day of pregnancy). Of the 17 females of the control group (group 3), normal offspring were born at full term, and two females were not pregnant.

At postmortem examination of the animals with interrupted pregnancy, either dead fetuses or signs of abortion were found in the uterus.

The cytological picture of the vaginal smears of the animals of the two experimental groups was more or less identical. Smears from females receiving folliculin showed an abundance of cells, mainly squamous epithelial cells with acidophilic staining properties, nucleated cells which were partly basophilic and partly acidophilic, and numerous leukocytes. In the smears from the animals receiving AA, the cell composition was the same as in those of the animals of group 1, except that fewer leukocytes were found. Before the interruption of pregnancy, the number of epithelial cells in the smears from the animals of groups 1 and 2 rose sharply, and the whole smear showed acidophilic staining properties. The smears from the animals of the control group contained very few cells. Among them were isolated nucleated cells and leukocytes. No epithelial cells were found. The staining of the films was basophilic.

---

P. M. Buiko Ukrainian Institute of Maternal and Child Welfare, Kiev. (Presented by Active Member of the Academy of Medical Sciences of the USSR A. P. Nikolaev.) Translated from *Byulleten' Éksperimental'noi Biologii i Meditsiny*, Vol. 62, No. 8, pp. 96-98, August, 1966. Original article submitted December 1, 1964.

Presumably the uniformity of the cytological picture of the vaginal smears of the rats receiving folliculin and AA may be interpreted as evidence of an increase in the estrogen background resulting from administration of AA.

Observations were made on twenty women aged from 20 to 40 years, seeking medical advice for termination of pregnancy in the case of a delay of 10-15 days in menstruation. Observations were made by the obstetrician-gynecologist L. I. Ivanyuta.

In 16 of the 20 women examined, bleeding of normal menstrual type appeared 1-3 days after a course of AA. In 4 women, bleeding did not take place. The excretion of estrogens after taking AA was increased in 12 of the 16 women examined (mean before taking AA 284  $\mu$ g, after taking AA 360.4  $\mu$ g). The excretion of pregnandiol and 17-ketosteroids remained practically unchanged after the course of AA.

It may be concluded from the results of these investigations that if large doses of AA are administered, the estrogen background is raised, and this may be a possible cause of the termination of pregnancy after taking large doses of AA.

#### LITERATURE CITED

1. E. P. Samborskaya, Byull. éksp. biol., 10, 110 (1962).
2. E. P. Samborskaya, Byull. éksp. biol., 4, 105 (1964).
3. E. P. Samborskaya, Pediat. Akush. i Ginek., 2, 62 (1964).

---

All abbreviations of periodicals in the above bibliography are letter-by-letter transliterations of the abbreviations as given in the original Russian journal. *Some or all of this periodical literature may well be available in English translation.* A complete list of the cover-to-cover English translations appears at the back of the first issue of this year.

---