

# EFFECT OF INTRAUTERINE INTRODUCTION OF A POLYMER ON UTERINE CONTRACTIONS

L. L. Libenzon and N. S. Masyutina

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Introduction of a foreign body into the uterine cornu of a female rabbit caused a prolonged increase in its contractile activity. In this way conditions unfavorable to fertilization and implantation of the ovum were produced.

The mechanism of action of intrauterine contraceptive devices has not been adequately explained [5, 6, 9, 10]. Some workers consider that it is based on hyperperistalsis of the uterus and fallopian tubes, preventing implantation of the blastocyte or disturbing the process of fertilization, while others, notably Karr (see [8]) observed no effects of intrauterine contraceptive devices either on the contractile activity of the myometrium in rabbits or on the intrauterine pressure in women [9, 10]. An increase in the contractile activity of the uterus in women was observed only during the first 2-3 months after introduction of the contraceptive, and mainly before menstruation.

The object of the present investigation was to study the contractile activity of the uterus in a long-term experiment after introduction of a foreign body into the uterine cornu.

## EXPERIMENTAL METHOD AND RESULTS

Recording the biopotentials of the myometrium is an objective method of assessing the functional state of the uterus [1-4]. Uterine potentials have been recorded by means of electrodes implanted into one of the uterine cornua [2].

Laparotomy was performed with sterile precautions under thiopental anesthesia, the uterine cornu mobilized, and electrodes implanted into it with atraumatic needles. The abdomen was closed with sutures, and the ends of the leads from the electrodes brought out under the skin in the occipital region.

On the 15th day after the operation of implantation of the electrodes a second laparotomy was performed, the uterine cornu (in which the electrodes were implanted) was again mobilized, and the polymer was introduced into it in a proximal direction. The polymer consisted of a segment of a standard Lipp's loop made of brand 2020-T neutral polyethylene measuring  $4 \times 1$  mm.

The experiments were performed on 30 sexually mature chinchilla rabbits weighing 3,500-4,500 g, 15 of which formed the experimental group (polymer introduced) and 15 the control group (no polymer introduced).

The uterine electrical activity (UEA) was recorded on an ÉGS-3 electrogastrograph (frequency specification from 0.02 to 0.2 Hz, recording speed 10 mm/min).

In both groups the potentials were recorded 24 h after the operation of implantation of the electrodes, and again on the 4th-5th, 7th-9th, and 13th-15th days. In the experimental group the UEA was also recorded at the same time after introduction of the polymer into the uterine cornu.

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Quantitative analysis of the UEA was carried out by the method suggested by Lisovskaya [3]. The values obtained were expressed in conventional units (c.u.).

The UEA 24 h after implantation of the electrodes was ( $M \pm m$ )  $15.1 \pm 0.81$  c.u. During the next 4-5 days it reached  $25.2 \pm 1.26$  u.c., but by the 7th-9th day it had fallen to  $15.2 \pm 0.89$  c.u., and by the 13th-15th day to  $9.9 \pm 0.51$  c.u. The UEA 24 h after the operation of implanting the polymer was  $20.6 \pm 1.62$  c.u., on the 4th-5th day it was  $30.2 \pm 1.80$  c.u., on the 7th-9th day  $33.0 \pm 2.08$  c.u., and on the 13th-15th day  $9.5 \pm 0.66$  c.u.

Introduction of the foreign body (polymer) into the uterine cornu of the experimental animal thus caused a prolonged and progressive increase in its contractile activity, which considerably exceeded the contractile activity of the cornu after implantation of the electrodes into it.

The results suggest that one of the mechanisms of the contraceptive effect may be a prolonged increase in the contractile activity of the uterus in response to introduction of the foreign body into its cavity, thereby preventing the process of fertilization or implantation of the blastocyte.

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