THE EFFECT OF DRUGS ON IMPLANTATION IN RATS WITH AN INTRAUTERINE DEVICE IN ONE HORN OF THE UTERUS

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The mechanism of the antifertility effect of the IUD has not been clearly elucidated. Recent experimental results suggest that prostaglandins released by such a device could inhibit implantation (Chaudhuri, 1971; Saksena, Lau & Castracane, 1974), either by expelling the blastocyst through uterine contractions or by exerting a luteolytic effect.

This hypothesis has been tested by administering acetyl salicylic acid and indomethacin, at dose levels known to prevent formation of prostaglandins, to rats with an IUD in one horn of the uterus. Similar experiments were carried out on rats treated with progesterone, LH or LH+prolactin which are known to counteract the luteolytic effect of prostaglandins (Fuchs & Mok, 1973).

A silk thread suture was inserted into the lumen of one horn of the uterus as described by Tarak & Chaudhury (1965) and the rats (150 to 200 g) were allowed to mate 14 days after insertion of the suture. The day spermatozoa were detected in the early morning vaginal smear was termed Day 1 of pregnancy. A laparotomy was performed on Day 10 of pregnancy to determine the number of implantation sites in the control horn and in the horn with the suture.

The doses used, the route and time of administration of the drugs, and the number of implantation sites observed in the rats are shown in Table 1.

The results indicate that, in rats, the IUD does not appear to act by releasing prostaglandins from the endometrium of the uterus since there were no implantation sites in the horn with the IUD in animals in which indomethacin or acetyl salicylic acid would have prevented the synthesis of prostaglandins. These results confirm the findings of Chaudhuri (1973) with indomethacin.

It is interesting to note that LH at a dose level of 250 $\mu\text{g/kg}$ twice a day inhibited implantation in the control horns of all seven rats. If this effect can be demonstrated in other species, including women, administration of LH or LH-RF might provide an additional method of contraception.

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Table 1. Effect of different drugs administered on different days of pregnancy on implantation as seen on Day 10 of pregnancy in rats with an IUD in one horn

Group	No. of rats/group	Drug	Dose	Route of administration	Day of administration	No. of implantation sites at Day 10 of pregnancy	
						Control horn	Horn with IUD
1	5	Indomethacin	3 mg/kg	Subcutaneous	1, 2, 3, 4	6, 5, 6, 5, 1	0, 0, 0, 0, 0
2	5	Indomethacin	6 mg/kg	Oral	2, 3, 4	4, 3, 3	0, 0*
3	5	Acetyl salicylic acid	10 mg/kg	Oral	1, 2, 3, 4	5, 1, 0, 3, 3	0, 0, 0, 0, 0
4	6	Progesterone	20 mg/kg	Subcutaneous	1, 2, 3, 4	4, 3, 2, 6, 4, 5	0, 0, 0, 0, 0, 0
5	7	LH	250 µg/kg	Intramuscular	2, 3, 4	0, 0, 0, 0, 0, 0, 0	0, 0, 0, 0, 0, 0, 0
6	3	LH	25 µg/kg	Intramuscular	2, 3, 4	2, 4, 5	0, 0, 0
7	5	LH	5 µg/kg	Intramuscular	2, 3, 4	0, 6, 3, 6, 5	0, 0, 0, 0, 0
8	5	LH + prolactin	10 µg/kg	Intramuscular	2, 3, 4, 5	5, 7, 1, 0, 0	0, 0, 0, 0, 0, 0

* Three rats died before reaching Day 10 of pregnancy.

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