BRIEF COMMUNICATION

THE EFFECT OF SEVERAL RELAXIN PREPARATIONS ON THE HYSTERECTOMIZED GUINEA-PIG

GEORGIANA JAGIELLO*

Department of Medicine, University of Illinois, Chicago, Illinois, U.S.A.

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Summary. It has been demonstrated that, with widely divergent doses of seven preparations of relaxin, vaginal opening and ovulation can be induced in the hysterectomized guinea-pig. This result was independent of total dose as assessed by relaxin assays. It is suggested that such preparations contain a compound which can influence the activity of the corpus luteum.

Since relaxin has been shown to be produced by the guinea-pig uterus in response to injections of progesterone (Hisaw, Zarrow, Money, Talmage & Abramowitz, 1944) it seemed reasonable to investigate this compound as a regulator of the activity of the corpus luteum in the hysterectomized animal.

Sixty-three mature virgin female guinea-pigs of initial weight 375 to 590 g and genetically heterogeneous were used. Oestrous cycles (vaginal openings) were observed for 64 days and only those animals which exhibited a regular 16-day cycle were used for the experiments. Seven to 9 days after the first day of vaginal opening, animals were anaesthetized with intraperitoneal sodium pentobarbital and the uterus totally removed through a mid-ventral abdominal incision. At autopsy the completeness of hysterectomy was checked and no remnants were detected.

The seven relaxin preparations studied (Table 1) were prepared from pregnant sow ovaries, although method of extraction varied (Frieden & Hisaw, 1950; Doczi, personal communication; Frieden, Stone & Layman, 1960). Relaxin potencies were assayed by the method of Hisaw (1926) and the method of Steinetz, Beach, Kroc, Stasilli, Nussbaum, Nemith & Dun (1960). All preparations were given intramuscularly in 5% beeswax in sesame oil. They were kept in a desiccator at 4° C until the day of use when they were added to the prepared beeswax and oil, heated to 60° C and injected (Kliman & Greep, 1958). These preparations were given 28 to 42 days after hysterectomy over 4 days in total doses of 420 to 14,000 guinea-pig units (GPU). Daily examinations for vaginal opening were made. Checks for ovulation points in the ovaries were carried out on Day 2 of vaginal opening in the experiment with a total test dose of 420 GPU. In subsequent experiments the oviducts were flushed for

* Present address: Paediatric Research Unit, Guy's Hospital, London, S.E.1.

ova, or serial sections of the oviducts and ovaries were made on the 3rd or 4th day of vaginal opening. Corpora lutea diameters were assessed by measuring the largest section occurring in 10 μ serial sections with a micrometer eyepiece.

The results were variable. Of the sixty-three animals tested, thirty-seven exhibited vaginal opening and twenty-five of these had ovulated. Each vaginal opening lasted 4 to 5 days and in those animals where ovulation occurred, two to four ova or rupture points were observed. When vaginal opening occurred it always began late on the last day of treatment or was present the next morning. Examination of Table 1 will reveal that both vaginal opening and ovulation were independent of the dose of relaxin as ordinarily assayed. The average diameters of old hysterectomy corpora lutea in the animals which ovulated (1.6 mm) was similar to that found in females which were treated but did not ovulate (1.9 mm).

TABLE 1
RESPONSE TO DIVIDED DOSES OF SEVERAL RELAXIN PREPARATIONS

<i>Relaxin preparation</i>	<i>Total dose-(GPU)*</i>	<i>Vaginal openings/ Total No. pigs†</i>	<i>Interval between hysterectomy and relaxin (days)</i>
152-1	420 (21)	4/4 (4)	37
150-1	420 (8)	5/6 (4)	37
176-1	420 (4)	5/5 (5)	42
181-1	420 (5.1)	3/6	42
181-1	820 (10)	3/3 (1)	38
W1164-A (Lot 66)	820 (5.5)	1/4 (1)	38
1279-7	1430 (0.8)	2/7 (2)	28
W1164-A (Lot 8360)	1430 (12)	3/3 (1)	37
1279-7	3500 (1.8)	1/11 (1)	28
W1164 (Lot 8360)	6680 (56)	4/4 (1)	28
1279-7	7560 (4.0)	3/6 (3)	28
1279-7	14,000 (7.4)	3/4 (2)	34

* Milligrams of preparation given in parentheses.

† Proven ovulations given in parentheses.

It would appear that relaxin preparations can affect the function of the corpus luteum and permit ovulation to occur. Spies, Gier & Wheat (1964) observed luteal regression in some of their relaxin-treated hysterectomized and cycling guinea-pigs. The effects they noted were inconsistent and dose-independent as were those in the present experiments. Such data would be explicable if one of the fractions of the very heterogeneous relaxin preparations was the most active factor in inducing vaginal opening and ovulation, and was present in widely varying amounts depending on the method of extraction.

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