EFFECT OF VASOTOCIN AND OXYTOCIN ON INTRAUTERINE PRESSURE IN THE HEN

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(Received 1st October 1970)

Summary. In anaesthetized hens, intravenous injections of vasotocin and oxytocin increased the intrauterine pressure. The response to vasotocin was much more intensive than to oxytocin.

In the hen, injection of either vasotocin or oxytocin caused expulsion of the egg 1 to 20 hr prematurely (Rzaśa & Ewy, 1970). The effect of these hormones on pressure within the uterus (shell gland) is reported.

Fifteen New Hampshire, laying hens (no egg *in utero*) were used. Hens were anaesthetized with sodium phenobarbitone (160 mg/kg) injected i.m. Intrauterine pressure was recorded on a kymograph from a water manometer connected to polyethylene tubing and a latex balloon of 30-ml capacity. After the balloon had been introduced into the uterus through the cloaca, it was

TABLE 1
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IN THE HEN

Drug used	n	Dose ($\mu\text{g/kg}$ i.v.)	Intrauterine pressure (mm H ₂ O) (Means $\pm$ S.E.)		Duration of response (min)
			Before injection	Maximum response after injection	
Vasotocin	6	0.1	137.0 $\pm$ 3.1	164.0 $\pm$ 6.2**	22.0
Vasotocin	6	0.2	141.2 $\pm$ 5.4	205.2 $\pm$ 13.4**	39.5
Vasotocin	6	0.4	144.0 $\pm$ 5.0	241.2 $\pm$ 19.1***	71.0
Oxytocin	6	1.0	135.6 $\pm$ 4.0	153.5 $\pm$ 6.0*	8.0
Oxytocin	6	2.0	136.3 $\pm$ 3.7	161.2 $\pm$ 8.1*	13.5
Oxytocin	6	4.0	140.0 $\pm$ 5.1	190.0 $\pm$ 13.0**	23.0

n—number of observations.

Significance of differences between values before and after treatment:

* $P < 0.05$, ** $P < 0.01$, *** $P < 0.001$.

filled with air and its position was subsequently verified *post mortem*. Synthetic oxytocin (450 oxytocic units/mg; Syntocinon, Sandoz) and synthetic vasotocin (250 pressor units/mg; Arginin Vasotocin, Sandoz) were used. The hormones were administered in doses effective in producing premature oviposition. All the injections were made into a wing vein in a volume of 0.2 to 0.4 ml. A statistical comparison of the results was made by Student's *t* test.

The changes in intrauterine pressure induced by vasotocin and oxytocin are presented in Table 1 and Text-fig. 1. The doses of vasotocin, ranging from 0.1 to 0.4 $\mu\text{g/kg}$ body weight, caused a marked increase in the pressure in relation to the initial pressure (19.1 to 67.3%, respectively). The increase was maintained for 22 to 71 min depending upon the dose. Doses of oxytocin, ranging from 1.0 to 4.0 $\mu\text{g/kg}$, also induced a significant rise in intrauterine pressure in relation to the initial pressure (13.9 to 35.7%, respectively), the increase being maintained on average from 8 to 23 min.

TEXT-FIG. 1. The intrauterine pressure changes after i.v. injections of vasotocin (○: 0.2 $\mu\text{g/kg}$) and oxytocin (●: 2.0 $\mu\text{g/kg}$). Each point represents the mean of six experiments. For clarity, standard errors are indicated for only three points.

In view of the present experiments and the evidence indicating a release of neurohypophysial hormone at about oviposition (Tanaka & Nakajo, 1962, 1963; Sturkie & Lin, 1966; Opel, 1966) it seems reasonable to assume that vasotocin is involved in expulsion of the egg.

The synthetic vasotocin and oxytocin used in this study were kindly supplied by Sandoz Ltd, Basle, Switzerland.

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