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## Effect of Oxytocin on Adrenocortical Activity in Man. (22400)

ROGER K. MCDONALD AND VIRGINIA K. WEISE.

*National Institute of Mental Health,* Bethesda, Md.*

In evaluation of the effect of hypothalamic neurohormones on ACTH release in man, it has been shown that intravenous administration of commercial vasopressin (Pitressin) causes a significant rise in plasma 17-hydroxycorticosteroid concentration(1). In view of the fact that both oxytocin and vasopressin are present in the hypothalamus as well as in the posterior pituitary gland(2-5), we have extended our initial observation to evaluate the effect of the intravenous administration of oxytocin on the plasma 17-hydroxycorticosteroid concentrations. In the present study, both commercial oxytocin (Pitocin)† and a highly purified preparation of oxytocin‡ have been employed.

*Methods.* Four male and 4 female, normal subjects, ranging from 18 to 21 years of age, were studied. The general procedure and laboratory analyses have been previously described(1). Saline was the control infusion for the Pitocin study and saline plus oxytocin diluent was the control infusion for the oxytocin study. All infusions were given from 8 A. M. to 10 A. M.

*Results. Effect of Pitocin.* Fig. 1 shows the mean change in the plasma 17-hydroxycorticosteroid concentration associated with the infusions of Pitocin and the control solution. There is no significant difference between the 2 curves. Pitocin was without effect on the 12-hour urinary excretion of 17-hydroxycorticosteroids and on the number of circulating eosinophils. Pulse and blood pressure recorded hourly for the 8-hour period showed no difference between the days of Pitocin and saline infusions.

*Effect of Highly Purified Oxytocin.* Since Pitocin has only 50-70% of the purity of du Vigneaud's highly purified oxytocin(6), it was deemed necessary to test the latter preparation. Four individuals were infused with 9 units of highly purified oxytocin in saline on one day and with a comparable volume of the control solution on another day. No significant difference between plasma 17-hydroxycorticosteroid levels during the 2 tests was noted (Fig. 2).

In another series of observations, 6 subjects were infused with an increased amount

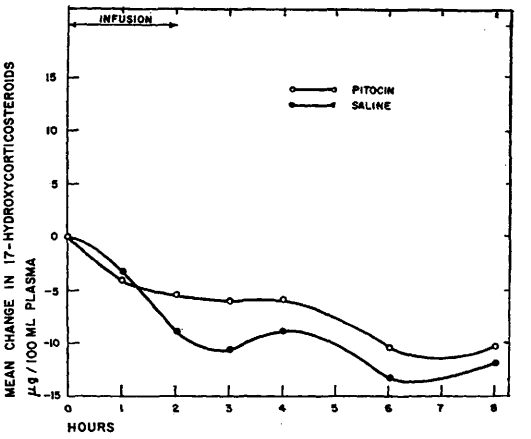


FIG. 1. Effect of Pitocin on plasma 17-hydroxycorticosteroid concentration. Individual points represent mean values for group of 7 young, normal subjects receiving between 22.6 and 34.6 units of Pitocin in a 2-hr intravenous infusion.

* NIH, Public Health Service, U. S. Dept. of Health, Education, and Welfare.

† Parke, Davis & Co., lot nos. S-1970 and M-307M.

‡ Dr. Vincent du Vigneaud, Cornell University Medical College, kindly supplied us with this preparation of oxytocin.

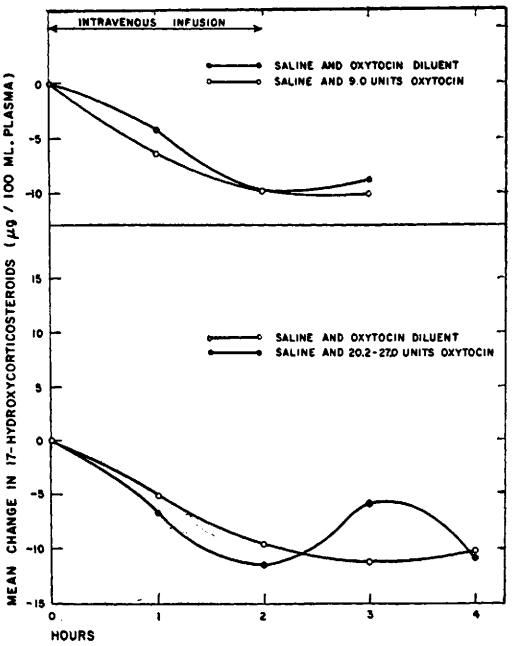


FIG. 2. Effect of infusion of highly purified oxytocin in saline on plasma 17-hydroxycorticosteroid concentration. Upper graph represents mean values of 4 young, normal subjects given 9 units of highly purified oxytocin in saline infusion and saline infusion containing oxytocin diluent. All infusions were administered at 1 ml/min. for 2 hr. Lower graph represents mean values of 6 young, normal subjects given 21.7 to 27 units of highly purified oxytocin in saline infusion and saline infusion containing oxytocin diluent. All infusions administered at approximately 3 ml/min. for 2 hr.

of oxytocin (20.2 - 27 units). Again, the control data were obtained using a comparable volume of saline plus oxytocin diluent. Infusion of the larger amount of oxytocin had no significant effect on the plasma 17-hydroxycorticosteroid levels (Fig. 2). The secondary rise in plasma 17-hydroxycorticosteroids that occurred during the hour following the termination of the oxytocin infusion is not significant ($P<0.2$). The 12-hour urinary excretion of 17-hydroxycorticosteroids and the fall in eosinophils were not significantly different during this oxytocin test and the control test.

*Comments.* It is apparent that neither Pitocin nor highly purified oxytocin has any stimulatory effect on ACTH production in this experimental situation. This is of interest in view of the structural similarity of oxytocin and vasopressin and the fact that there is some degree of overlap in their physiologic effects(4).

In initial observations on the effect of intravenous administration of oxytocin on ACTH release, it appeared that there was a secondary rise in plasma 17-hydroxycorticosteroid concentration an hour after the infusion had been terminated. However, this secondary rise was shown convincingly by only 3 of the 6 individuals and, therefore, was not statistically significant.

*Conclusions.* Intravenous infusion of either Pitocin or highly purified oxytocin is not associated with increased plasma concentrations or urinary excretion of 17-hydroxycorticosteroids.

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