

# **Dopamine intervention in induction of polycystic ovary by morphine in the VMH of female rat**

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**Introduction:** Morphine significantly reduces the chance of pregnancy in rat and causes infertility. The occurrence of irregular menstrual cycles in humans has been reported by morphine. Also level of estradiol decreases in ovary after injection of morphine in rat. In the mechanism of morphine action, it is believed that the drug stimulates three types of opioid receptors mu, delta and kappa. Stimulation of these receptors decrease input of calcium into the cell, increase output of potassium from the cell and decrease cAMP in the cell. The release of norepinephrine is an important factor in the hypothalamus –pituitary gonad axis. The effects of opioids on the release of dopamine in the ventromedial hypothalamus (VMH) has not been yet investigated which is our goal.

**Materials & Methods:** Female rats (220-300 g) kept under standard conditions. Using a stereotactic device, they were surgically coordinated: Anterior-posterior: -1/92, ventral: 9, lateral: 0.5. After a week recovery they were microinjected morphine (0.1, 0.2, 0.4 µg/rat, once intra-VMH). To investigate the dopamine intervention with the morphine sulphiride (0.1, 0.2, 0.4, µg/rat once intra-VMH) was injected intra-VMH prior to morphine to inhibit the dopamine D2 receptor. The control group received physiological saline (1 µL/rat, intra-VMH). Three days after the experiment, the uterus, the ovary and the brain samples were collected in %10 formalin and studied histopathologically using hematoxylin & eosin.

**Results:** The ovaries in group in which morphine was injected intra-VMH showed polycystic features as compared to the control group. With the presence of sulphiride prior to morphine intra-VMH the polycystic ovary was decreased.

Discussion & conclusion: These results indicate that morphine disrupts fertility. This effect is most probably is resolved by dopamine D2 receptor signaling blocking.

**Key words: Dopamine, Morphine, polycystic ovary, ventromedial hypothalamus, female rat**