



Action of progesterone, estradiol and oxytocin on contractile activity of isolated gastric strips in rats

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Author contributions: All authors contributed equally to the work.

Original title: *China National Journal of New Gastroenterology* (1995-1997) renamed *World Journal of Gastroenterology* (1998-).

Received: October 12, 1995

Revised: April 22, 1996

Accepted: May 13, 1996

Published online: September 15, 1996

Abstract

AIM: Nausea and vomiting in early pregnancy are extremely common, and the effects of pregnancy and female steroid hormones on the gastrointestinal motility are followed with interest. We studied the effects of progesterone, estradiol and oxytocin on the contractile activity of longitudinal muscle (LM) of fundus, LM and circular muscle (CM) of body and antrum, and CM of pylorus in rats *in vitro*.

METHODS: Each strip was suspended in a tissue chamber containing Krebs solution, constantly warmed by water jacked and supplied with 95% O₂ and 5% CO₂. The contractile response was measured isometrically on the polygraph. After 1 h of equilibration with 1 g tension, drugs were added in the tissue chamber.

RESULTS: (1) Progesterone significantly decreased the resting tension of fundic and body LM, the mean contractile amplitude of body and antral LM and CM, and the motility index of pyloric CM. (2) The progesterone inhibition of the mean contractile amplitude

could be partially blocked by phentolamine in CM of body, and by phentolamine or indomethacin in LM of body. Hexamethonium, propranolol and L-NNA (an inhibitor of actin in LM of body). Hexamethonium, propranolol and L-NNA (an inhibitor of NO synthase) did not block the action of progesterone. (3) Estradiol significantly decreased the resting tension of fundic LM and body LM and CM, the mean contractile amplitude of body and antral LM and SM, and the motility index of pyloric CM. (4) Phentolamine, indomethacin, hexamethonium, propranolol and L-NNA could not block the action of estradiol. (5) Oxytocin significantly increased the resting tension of LM and CM of body and LM of antrum, the mean contractile amplitude of LM and CM of body antrum, and the motility index of CM of pylorus. (6) Atropine and hexamethonium could not block the action of oxytocin.

CONCLUSION: (1) Progesterone and estradiol inhibited the contractile delaying gastric emptying *in vivo*. (2) Oxytocin stimulated the contractile activity of strips, and it was consistent in prokinetic action *in vivo*. (3) The mechanism of these hormones on stomach muscle strips seems to be a direct one except that the action of progesterone on body was partly mediated *via* prostaglandin and adrenergic α -receptors.

Key words: Progesterone; Estradiol; Oxytocin; Contractile activity; Isolated gastric strips

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Qu SY, Wang F, Zheng TZ, Li W, He DY. Action of progesterone, estradiol and oxytocin on contractile activity of isolated gastric strips in rats. *World J Gastroenterol* 1996; 2(Suppl1): 38 Available from: URL: <http://www.wjgnet.com/1007-9327/full/v2/iSuppl1/38.htm> DOI: <http://dx.doi.org/10.3748/wjg.v2.iSuppl1.38>

E- Editor: Liu WX



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