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JIRAPORN OUSINGSAWAT : ACUTE EFFECT OF PROLACTIN ON CALCIUM TRANSPORT IN THE COLON OF RATS. THESIS ADVISORS : NATEETIP KRISHNAMRA, Ph.D., LIANGCHAI LIMLOMWONGSE, Ph.D., CHUMPOL PHOLPRAMOOL, Ph.D., SURAT KOMINDR, M.D. 126p. ISBN 974-661-856-3.

The present study aimed to investigate colonic handling of calcium and water under normal conditions and after acute administration of prolactin in mature female Wistar rats. The study was performed by perfusing test solution containing 20 mM  $^{45}\text{Ca}$  labeled  $\text{CaCl}_2$  for measuring calcium fluxes and sodium ferrocyanide for volume change through 8 cm *in situ* colonic segment for 30 minutes at zero perfusion rate and for 60 minutes at perfusion rates of 0.5, 1.0 or 2.0 ml/min. Results showed that increase in perfusion rates from zero to 0.5 and 1.0 ml/min led to increase in plasma to lumen calcium flux from  $0.04 \pm 0.01$  to  $-0.04 \pm 0.04$  and  $-0.09 \pm 0.02$  mmole/g dry weight/hr, respectively without altering net water absorption. However, calcium fluxes did not change at perfusion rate of 2.0 ml/min. There was no direct correlation between calcium and water transport though the latter decreased with a reduction in luminal sodium concentration.

The acute effect of intraperitoneally administered 0.4, 0.6 and 1.0 mg prolactin/kg body weight on calcium and water transport was investigated at perfusion rate of 1 ml/min. Although none of the doses of prolactin given at the start of perfusion had effect on calcium fluxes, 0.4 mg prolactin/kg body weight decreased net water absorption from  $3.86 \pm 0.90$  to  $0.88 \pm 0.64$  ml/g dry weight/hr ( $p < 0.001$ ), while 0.6 and 1.0 mg prolactin/kg body weight reversed net water absorption to secretion of  $2.20 \pm 0.63$  and  $2.33 \pm 0.89$  ml/g dry weight/hr, respectively ( $p < 0.001$ ). This action of prolactin was abolished when luminal sodium concentration was reduced from 180 to 80 mM. When prolactin action was investigated at zero perfusion rate, prolactin was found to have no action either on calcium fluxes or water transport.

It can be concluded that, unlike in the small intestine, calcium fluxes in the colon are not related to water transport and do not respond to prolactin. Water transport, on the other hand, reverses from net absorption to net secretion at higher doses of prolactin. It is proposed that prolactin-induced water secretion is mediated by recycling of luminal sodium through the cell into the intercellular space and across the tight junction into lumen followed by the osmotic flow of water.