

Thesis Title The Possible Involvement of Prolactin on
 the Gastrointestinal Handling of Calcium
 in Wistar Rats.

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Date of Graduation 25 August B.E. 2532 (1989)

ABSTRACT

Possible influence of exogenous ovine prolactin (PRL) on the in vivo intestinal calcium (Ca) absorption was investigated in non-pregnant, pregnant, and lactating female Wistar rats. Solution containing 5.0 mM CaCl₂ and 0.1 uCi ⁴⁵Ca was given intragastrically to the control animals and prolactin-treated animals which received intraperitoneal administration of 0.01 or 0.02 mg PRL/100 g BW immediately, or 1 hr before the experiment, and subcutaneous administration of 0.1 or 0.2 mg PRL/100 g BW 24 hr before the experiment. Subsequent plasma ⁴⁵Ca contents were used as index of intestinal calcium absorption. In the non-pregnant females, the most appropriate dose of prolactin was an intraperitoneal administration of 0.02 mg PRL/100 g BW 1 hr before the experiment. The plasma ⁴⁵Ca contents of control versus PRL-treated rats were 2.09±0.28 VS 4.39±0.61 (p<0.05),

2.52±0.14 VS 5.62±0.49 (p<0.001), 3.14±0.16 VS 6.54±0.51 (p<0.001), 3.54±0.23 VS 6.22±0.41 (p<0.001) and 2.98±0.30 VS 5.43±0.33% administered dose (p<0.001) at 5,10,15,30 and 60 min respectively. The intestinal mucosa ⁴⁵Ca contents of the PRL-treated rats were significantly decreased in the duodenum and increased in the distal jejunum and ileum. Although female rats showed more responsiveness to prolactin than males, intraperitoneal injection of 0.02 mg PRL/100 g BW 1 hr prior the intragastric administration of test solution also led to a significant increase in calcium absorption in the male rats.

The physiological significance of endogenous PRL in the regulation of the intestinal calcium absorption was demonstrated in the pregnant (day 20 of pregnancy) and lactating rats (day 5 of lactation). The experimental groups were given two doses of 3 mg/kg BW of bromocriptine, an inhibitor of prolactin secretion, at 17 hr and 1 hr before the experiment. Bromocriptine treatment significantly decreased the calcium absorption in lactating rats, but not in pregnant rats. The reduced calcium absorption in the former was partially restored by the concurrent administration of exogenous prolactin.

The in situ intestinal loop experiments were performed to find out whether the duodenal active transport and the jejunal passive transport of calcium were altered during lactation as compared with nonlactating rats. It was found that the duodenal active