EFFECT OF PREGNANCY AND LACTATION ON GASTROINTESTINAL MOTILITY IN RATS

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Summary : Gastrointestinal motility was studied by barium meal technique in pregnant and lactating rats. Gastric emptying and intestinal transit were found to be significantly reduced during pregnancy but no appreciable change was observed during lactation.

Key words : pregnancy, lactation, gastric emptying, barium sulphate, intestinal transit

INTRODUCTION

The gastrointestinal tract in rat has been known to undergo remarkable adaptive morphological changes during pregnancy and lactation (1, 2, 4). There are some reports on intestinal absorption during pregnancy and lactation in rat showing contradictory results (1, 2, 6). However, the effect of reproduction on gastrointestinal motility in rat has not been studied as yet. Hence the present study was undertaken.

MATERIAL AND METHODS

Inbred female virgin, pregnant (20th day) and lactating (immediate post-weaning) rats of Charles-Foster Strain weighing about 180–200 g were used. The animals were fasted for 18–20 hr before starting the experiment and were allowed free access to water during the fasting period.

The animal was given just sufficient ether, so that it submitted passively to intubation with a human infant feeding tube and 3 ml of barium sulphate suspension in isotonic saline (0.9% w/v) containing 100% w/v barium sulphate was introduced into the stomach by a 5 *ml* syringe. After an interval of 15 minutes the animal was killed by cervical dislocation; the abdomen was opened by a midline incision and ligatures

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were rapidly applied at the gastro-oesophageal junction, gastro-duodenal junction, ileo-caecal junction and at the head of the barium column which could be seen through the thin wall of the intestine (5). The stomach and the small intestine were removed from the abdomen.

The stomach was cut open and washed for its luminal contents into a beaker with normal saline. The stomach washings were centrifuged at 3000 rpm for 5 min in a clinical centrifuge. The sediments were dried in a hot-air oven (100-110°C) to a constant weight.

RESULTS AND DISCUSSION

Table I shows the effects of pregnancy and lactation on gastric emptying and intestinal transit. Compared with the controls, the gastric emptying and the intestinal transit were significantly reduced in the pregnant rats, though there was no significant change in the lactating animals.

TABLE I :

	Gastric emptying in 15 min - percent release (Mean±S.E.M.)	*Intestinal transit in 15 min - percent travelled (Mean±S.E.M.)*
Virgin	76.99±1.11(7)	65.52±2.49 (7)
Pregnancy	50.21±1.12 (6)*	44.19±1.94 (7)*
Lactation	75.05±1.70 (6)	64.55±2.21 (10)

*Denotes significance at $P<0.001$. The number in parentheses is the respective number of animals.

The intestinal transit and the gastric emptying were calculated on the basis of the methods described earlier (5, 7).

This preliminary study indicates that pregnancy influences the motor activity of the gastrointestinal tract. During pregnancy the rate of gastric emptying and the passage of test meal through the small bowel is reduced in rat. This reduced rate of passage could be due to generalised non-specific relaxation of gastrointestinal tone during pregnancy due to the hormones of pregnancy (3).

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