

Thesis Title THE SIGNIFICANCE OF VARIOUS INTESTINAL
SEGMENTS IN THE REGULATION OF PLASMA CALCIUM
CONCENTRATION

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ABSTRACT

Different segments of the intestine have different absorptive and secretory rates of Ca which may change according to physiological conditions. It was interesting to evaluate possible role of the intestine in acute regulation of plasma Ca level by observing changes in Ca transport after functional resection of certain intestinal segments.

For absorption study, absorbed Ca was calculated from the difference between administered ^{45}Ca and final luminal ^{45}Ca content. Calcium secretion was represented by luminal ^{45}Ca contents 60 min after iv injection of $^{45}\text{CaCl}_2$. Results showed that with luminal Ca of 0.3 or 10 mM, resection of duodenum or duodenum+proximal jejunum or colon or distal ileum+caecum+colon did not affect total Ca absorption. In contrast, Ca secretion was

significantly reduced with intestinal resection. Ca absorption was found to increase during hypercalcaemia and thyroparathyroidectomy-induced hypocalcaemia. Ca secretion, on the other hand, was directly related to plasma Ca concentration. It was further demonstrated that during hypercalcaemia, the proximal colon was partly responsible for increase in Ca secretion.

It could be concluded that (i) the intestine exhibited redundancy in Ca absorption and (ii) that the apparent increase in Ca absorption and reduced secretion during hypocalcaemia and increased secretion during hypercalcaemia may help to normalize or prevent further change in plasma Ca concentration.