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## New clinical and experimental aspects of intestinal magnesium transport.

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### Abstract

Mg transport across various segments of the rat small and large bowel was measured in the absence of electrochemical gradients and using the voltage clamp technique. In the mucosa-to-serosa (ms) Mg flux across the duodenum, ileum, and colon a cellular part is involved, amounting to 40-70% of the total ms Mg flux measured across the short-circuited tissue. However, serosa-to-mucosa (sm) Mg flux is purely passive, suggesting that net Mg transport is largely determined by convectively driven Mg flux across the paracellular pathway. Mg is absorbed across the colon and ileum but in the duodenum paracellularly it is secreted due to an 'anomalous solvent drag effect'. Mg in the caecum decreases cellular ms Ca transport but in the other segments only passive ms Ca flux is reduced by a decrease of the paracellular permeability for Ca, or by a Mg-induced decrease in water absorption. Mg transport across all segments is insensitive to 1,25(OH)<sub>2</sub>D<sub>3</sub>. Dexamethasone abolishes cellular Ca transport but stimulates paracellular ms Mg flux in the duodenum. It is concluded that in the rat (a) Mg and Ca are transported by distinct cellular and paracellular mechanisms; (b) Mg transport is largely confined to the paracellular pathway; (c) the ileum and the colon are the major sites for the gut regulation of Mg homeostasis.

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