

Regulation of salt balance by large intestine

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Summary

There is an electrogenic Na absorption in the distal colon, which is activated by aldosterone and inhibited by low concentration of amiloride. We have investigated whether electrogenic Na absorption is regulated by intramural neurons in the guinea pig distal colon in vitro under short-circuit conditions. Carbachol (CCh, 1 mM, serosal side) reduced I_{sc}. This effect of CCh was abolished by atropine (10 mM, serosa). When the component of I_{sc} due to an electrogenic Na absorption was suppressed by amiloride (0.1 mM, mucosal side),

The I_{sc} decrease by CCh was completely abolished. Electrical stimulation of the preparations elicited a transient increase followed by a decrease in I_{sc}. These responses were abolished by tetrodotoxin (0.3 mM, serosal). Mucosal amiloride abolished the decreasing component of the I_{sc} change by electrical stimulation. Both the increase and the decrease in I_{sc} by electrical stimulation was significantly attenuated by atropine. It is concluded that the submucosal cholinergic neurons are involved via muscarinic receptors in the inhibition of electrogenic Na absorption.