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Pre- and post-synaptic modulation of neuromuscular transmission in smooth muscles by thiazole analogs of vitamin B1

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Abstract

The effects of structural analogs of vitamin B1, thiazole derivatives with alkyloxycarbonylmethyl substituents at position 3, on neuromuscular transmission were studied in the smooth muscles of the guinea pig gastrointestinal tract. In the smooth muscles of the stomach, the studied compounds depressed excitatory cholinergic neuromuscular transmission. In the case of 3-hexyl-, 3-decyl-, and 3-dodecyloxycarbonylmethyl-4-methyl-5-(2-hydroxyethyl)-thiazole chlorides this effect was due to their presynaptic action, while in the case of 3-menthyloxycarbonylmethyl-4-methyl-5-(2-hydroxyethyl)thiazole chloride it was due to the block of muscarinic acetylcholine receptors in smooth muscle fibers. In the circular smooth muscles of the distal colon, 3-decyloxycarbonylmethyl-4-methyl-5-(2-hydroxyethyl)thiazole chloride blocked non-adrenergic inhibitory synaptic potentials (ISP) apparently through interaction with the ATP-sensitive acetylcholine receptors. In contrast, 3-hexyloxycarbonylmethyl-4-methyl-5-(2-hydroxyethyl)thlazole chloride enhanced postinhibitory excitation, without changing the ISP amplitude. Possible ways of pre- and post-synaptic modulations of neuromuscular transmission by thiazole derivatives are discussed. It has been suggested that the effects of these compounds are due to similarity of their structures to the structure of vitamin B1.

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About this article

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* **Acetylcholine Receptor**
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