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Different sensitivity of miniature endplate currents in rat external and internal intercostal muscles to the acetylcholinesterase inhibitor C-547 as compared with diaphragm and extensor digitorum longus

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Abstract

Derivative of 6-methyluracil, selective cholinesterase inhibitor C-547 potentiates miniature endplate currents (MEPCs) in rat external intercostal muscles (external ICM) more effectively than in internal intercostal muscles (internal ICM). Effect of the C-547 on intercostal muscles was compared with those on extensor digitorum longus (EDL) and diaphragm muscles. Half-effective concentrations for τ of MEPC decay arranged in increasing order were as follows: EDL, locomotor muscle, most sensitive = 1.3 nM, external ICM, inspiration muscle = 6.8 nM, diaphragm, main inspiration muscle = 28 nM, internal ICM, expiration muscle = 71 nM. External ICM might therefore be inhibited, similarly as the limb muscles, by nanomolar concentrations of the drug and do not participate in inspiration in the presence of the C-547. Moreover, internal ICM inhibition can hinder the expiration during exercise-induced fast breathing of C-547- treated experimental animals. © 2009 by the Institute of Physiology, Czech Academy of Sciences.

Keywords

Acetylcholinesterase, Anticholin-esterase, Miniature endplate current, Skeletal muscle