

Antitussive effect of codeine in the pontine respiratory group in cats

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The pontine respiratory group (PRG), including the Kölliker-Fuse nuclei and parabrachial complex, is composed of heterogeneous population of respiratory neurons with a key role in regulation of respiratory rate, pattern, and rhythm. This regulation is accomplished through the functional connections of PRG neurons with respiratory nuclei in other parts of the brainstem. The involvement of PRG neurons in the antitussive activity of codeine was not yet analyzed.

This study investigated the effects of unilateral 3.3 mM codeine microinjections into the PRG on mechanically induced tracheobronchial cough in anesthetized cats. Electromyograms (EMGs) of the diaphragm (DIA) and abdominal muscles (ABD) and esophageal pressures (EP) were recorded and analyzed during cough.

Codeine microinjections in 8 cats did not significantly reduce the number of coughs or alter temporal parameters, but did decrease the amplitudes of cough expiratory ABD EMG and expiratory EP and less also cough DIA EMG amplitudes. Control microinjections of artificial cerebrospinal fluid in 6 cats had no significant effect on cough data compared to those after codeine microinjections.

These findings suggest that codeine suppresses the excitatory drives of PRG neurons to other brainstem regions that are involved in coughing.

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