

## Asthma, hypersensitivity pneumonitis and cough

0070

### Effect of codeine microinjections in the solitary tract nucleus on cough in cats

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Bilateral microinjections of codeine (3.3 or 33 mM) in the solitary tract nucleus rostral to the obex (rNTS) targeting the ventrolateral subnucleus and caudal to the obex (cNTS) targeting the commissural subnucleus were performed on 12 anesthetized spontaneously breathing cats. Tracheobronchial cough was elicited by mechanical stimulation of the intrathoracic airways with soft polyethylene catheter. The electromyograms (EMGs) of the diaphragm (DIA), abdominal muscles (ABD), and esophageal pressure (EP) at thoracic level were recorded. The results are expressed as means  $\pm$  SE.

Microinjections of 3.3 mM codeine in the rNTS ( $68 \pm 4$  nl for both microinjections, the total dose  $0.22 \pm 0.02$  nmol, 6 cats) resulted in reduced cough number, expiratory amplitudes of ABD EMG and EP and amplitudes of DIA EMG during cough. There was no significant change in the duration of cough phases in response to microinjection of codeine into the rNTS. The only altered cough related time interval was the prolongation of the period between the peak activity of DIA and ABD.

Codeine microinjections into the cNTS ( $108 \pm 33$  nl for both microinjections, total dose  $1.56 \pm 0.58$  nmol, 3 cats with 3.3 mM and 3 cats with 33 mM codeine) had no significant effect on tracheobronchial cough (all  $p > 0.1$ ).

The major findings of this study are that: 1) codeine microinjected into the NTS rostral to the obex in cats suppressed the cough reflex induced by mechanical stimulation of the tracheobronchial airways. 2) similar microinjections into the NTS caudal to obex had no effect on cough.

Unlike the cNTS, the rNTS contains complex codeine sensitive neuronal circuits involved in control of cough reflex in the cat with limited role in the temporal shaping of cough motor output.

**Figure 1.:** Representative examples of coughing changes induced by microinjections of codeine into the caudal NTS (cNTS) and the rostral NTS (rNTS).

]: moving average; DIA: the diaphragm EMG, ABD: the abdominal muscles EMG; EP: esophageal pressure; BP: arterial blood pressure. No significant cough changes were induced by microinjections of codeine into the cNTS. Microinjections of codeine in the rNTS resulted in reduction of expiratory and inspiratory cough efforts. Microinjections of codeine into the rNTS also decreased number of coughs.

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**Figure 1**

