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**Title:** Effect of lidocaine and its delivery in chronic cough

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**Body:** Introduction There are no consistently effective treatments for chronic cough. Patients frequently report an urge to cough sensation in the throat. Nebulised Lidocaine has previously been reported to subjectively improve cough but there are no objective data. Aims To compare the effect of lidocaine throat spray, nebulised lidocaine and placebo on subsequent 10-hour ambulatory cough rate (Vitalojak®) and urge to cough visual analogue scores. Methods 26 patients with chronic cough completed a randomised double blind, placebo controlled, three-way crossover study. The different treatments were: · Placebo: nebulised placebo followed by placebo throat spray · Nebulised lidocaine (600 mg): nebulised lidocaine followed by placebo throat spray · Throat spray Lidocaine (100 mg): nebulised placebo followed by lidocaine throat spray Data were analysed using generalised estimating equation models. Results 26 patients completed (22 female, mean age 53.5 yrs, median cough duration 10 yrs). Median 10 hour cough rate (n=25) (coughs/hr; IQR) was nebulised lidocaine 34.4 (13.5–57) vs lidocaine throat spray 23.9 (12–55.8) vs placebo 32.7 (19–56.1). For the natural log transformed cough rate, there was significant difference between placebo and lidocaine throat spray (p= 0.02), but not nebulised lidocaine (p = 0.8), with most of the effect in the first 3hrs. Compared with placebo, both nebulised (p=0.01) and throat spray lidocaine (p=0.02) substantially reduced the urge to cough, but with no difference between them (p=0.6). Conclusion Unlike nebulised lidocaine, throat spray significantly reduced the 10-hour cough rate compared with placebo. This suggests that local treatment targeting the pharynx may be an effective anti-tussive in chronic cough patients.