

Nebulized Lidocaine for Intractable Cough Near the End of Life

Cough is troublesome in many disease states and conditions. In one series of 240 cancer patients,¹ cough was reported in 33%, and 18% of patients suffered severe distress from cough. In lung cancer, cough is one of the most common symptoms; however, due to the presence of other concomitant symptoms, its impact may not be easily recognized.² Coughing can adversely affect quality of life by impairing communication and interfering with sleep.³ The high pressures, rapid airflow, and energy associated with effective cough can cause problems, including arrhythmias, hypotension, pneumothorax, rib fractures, hernias, urinary incontinence, syncope, and headaches.⁴

Topical spray or nebulized lidocaine is routinely used as an antitussive before bronchoscopy⁵ and has been shown to be safe and effective for the treatment of asthma⁶ and cough due to chronic obstructive pulmonary disease.⁷ Nebulized lidocaine is referenced as a potential treatment for intractable cough in a major palliative care textbook,² but there are no recent clinical data describing its use in the palliative care or advanced cancer setting. We attempted to establish whether nebulized lidocaine caused any demonstrable effect on the clinical course of patients who received it near the end of life to deter-

mine if there was sufficient impact to pursue a more rigorous clinical trial.

We reviewed the charts of four patients who received nebulized lidocaine for intractable cough as part of usual care while on the Thomas Palliative Care Unit, Richmond, Virginia. The study was granted an exemption by the institutional review board at Virginia Commonwealth University; all patients had died by the time of the data analysis.

Patients were given 5 mL of 2% lidocaine solution (100 mg) with 4–6 L/min oxygen until completion of the nebulized therapy, typically 3–5 minutes. Patients were required to maintain head elevation for at least 30 minutes post treatment and to refrain from eating or drinking for 40 minutes after the treatment completed. Patients were evaluated for cough severity using the Edmonton Symptom Assessment System index (none, mild, moderate, severe) before and after treatment. Because this was not a research study, but was done in usual care, there was not uniform collection of data. Although past studies have shown lidocaine-induced bronchoconstriction,⁸ we did not give a beta agonist along with the lidocaine, as more recent studies using lower dosages of lidocaine have failed to reproduce this effect.^{6,7} Patient char-

acteristics are reported in Table 1.

Results and Discussion

Improvement in cough was seen in two of our four patients. The lidocaine nebulized treatments were well tolerated with only transient topical side effects, including oropharyngeal numbness and bitter taste. Each of the patients died from their underlying illness within the following weeks.

Therapy for cough relies upon identifying the underlying cause and is usually successful if the cause is established. Exacerbating factors should be identified and treated when possible, such as drainage of pleural effusion, dilation of esophageal stricture to prevent aspiration, treatment of underlying lung disease with bronchodilators and steroids, initiation of diuretics to relieve cough due to pulmonary congestion from heart failure, starting nasal decongestants with post nasal drip, and initiating histamine-2 blockers or proton pump inhibitors to relieve cough due to gastroesophageal reflux disease. Nonspecific antitussive therapy is indicated when the etiology of the cough cannot be identified or cannot be controlled with specific therapy.²

Opioids such as morphine, codeine, and hydrocodone act on the central cough center and can be very effective for most coughs. Oral local anesthet-

Table 1

Patient Demographics and Results

PATIENT (AGE, SEX)	DIAGNOSIS	PRIOR TREATMENTS FOR COUGH	PRE-LIDOCAINE ASSESSMENT (NONE, MILD, MODERATE, SEVERE)	POST-LIDOCAINE ASSESSMENT
75 yo, Male	End-stage CHF and pulmonary HTN	Nebulized fentanyl	Moderate	Moderate, slight improvement
69 yo, Female	Anaplastic thyroid carcinoma	None	Severe	Insufficient data to comment
53 yo, Male	Esophageal squamous cell carcinoma, stage IV	Versed Dilaudid	Severe	Flow sheet: "Patient asked for more nebs because it helps."
35 yo, Female	Small cell carcinoma of the lung, stage IV	None	Severe	D/C summary: "lidocaine nebulizers for cough did help."

Abbreviations: CHF = congestive heart failure; HTN = hypertension; D/C = discharge

ics, such as benzonate, can be useful and are thought to work by inhibition of lung stretch receptors. Theophyllines and beta-agonists stimulate mucociliary clearance. Steroids are effective in obstructive processes such as asthma, chronic obstructive pulmonary disease, endobronchial tumors, and lymphangitic carcinomatosis. Antimuscarinic agents, such as ipratropium, hyoscine, and glycopyrronium, help thicken excessive secretions to promote clearance.

Nebulized local anesthetics, such as lidocaine and bupivacaine, have also been used to prevent or eliminate cough.² Most antitussives have significant side effects, such as sedation from opioids and antihistamines, tremor and arrhythmias from decongestants, and hallucinations and dysphoria from antimuscarinics, which adds to the load of an already highly symptom-burdened population.

Nebulized lidocaine appears to be well tolerated and effective in the treat-

ment of intractable cough near the end of life. One advantage to nebulized lidocaine is the lack of significant side effects. Although our pilot study population was small, we feel that our results do show possible benefit from nebulized lidocaine and justify proceeding to a larger randomized trial comparing lidocaine to placebo.

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