CLINICAL Q&A

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The Use of Nebulized Fentanyl for the Management of Dyspnea

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Question: I have heard about the use of nebulized fentanyl for the management of dyspnea in patients with cancer but have not found anything in the literature about this topic. Could you please discuss this topic and provide some references?

Answer: Dyspnea (breathlessness), an unpleasant awareness of breathing, is a subjective experience. This symptom is all too common, with reports of more than 70% of patients with advanced cancer experiencing this symptom (Ripamonti, 1999). Unfortunately, the mechanisms that lead to dyspnea are not well understood. Patients' self-report of dyspnea is the best indicator of its presence and level of distress. Respiratory rate and oxygenation saturation level are not reliable indicators of the presence of dyspnea. Patients tend to experience a chronic course, punctuated by episodes of acute shortness of breath. Dyspnea has physical and affective components, which may worsen anxiety and frighten patients. When dyspnea persists, patients often decrease their daily activities. Social isolation, dependence on others, and physiologic, psychological, social, and spiritual exhaustion may result (Coyne, Lyne, & Watson, 2002).

Patients' previous experiences with dyspnea influence their perception of breathlessness. Some patients have described dyspnea as "breathing through a straw." Healthcare providers sometimes underrecognize the impact of this symptom because of its subjective nature.

Concurrent treatments, including nonpharmacologic and pharmacologic therapies, should be initiated on a case-by-case basis. Oxygen therapy is recommended for dyspneic patients at the end stage of disease (Bruera, deStoutz, Valasco-Leiva, Schoeller, & Hanson, 1993). Other nonpharmacologic treatments for dyspnea include positioning for comfort. Propping patients up on pillows in a forward sitting position may improve air exchange. Cool air blown by fans or air from an open window or air conditioner also may be helpful. The presence of calm and reassuring family members and caregivers as well as the use of soothing, relaxing music and pursed-lip breathing can reduce anxiety, slow respiratory rate, and reduce dyspnea. Guided imagery and meditation, massage, and prayer are other therapies that can promote comfort and relaxation (American Association of Colleges of Nursing [AACN] & City of Hope Medical Center [COH], 2002).

Pharmacologic treatment of dyspnea includes the use of combinations of opioids, anxiolytics, sedatives, tranquilizers, and anticholinergic medications (AACN & COH, 2002; Newshan & Sherman, 1999). However, traditional bronchodilators, mucolytic agents, and anxiolytics often are suboptimal in treating dyspnea related to malignancy. In addition, adrenergic agonists and theophylline may cause increased anxiety and agitation and worsen patients' breathing status (Storey, 1994).

Opioids have been used effectively for more than a century to relieve breathlessness, but their mechanism is not clearly understood (Coyne, Viswanathan, & Smith, 2002). Starting opioids early in treatment will facilitate development of tolerance to respiratory effects and allow titration to comfort levels that will reduce anxiety and distress (Twycross, 1994). Nebulizer opioids using morphine, although a promising concept, has shown no benefit in controlled trials (Davis, Penn, A'Hern, Daniels, & Slevin, 1996; Runo & Ely, 2001). Nebulizer furosemide has been shown to protect against bronchospasms, which may be an etiology of dyspnea (Bianco, Vaghi, Robuschi, & Pasargiklian, 1998). Early pilot studies utilizing nebulizer fentanyl appear promising, perhaps because of this opioid's lipophilic properties (Coyne, Viswanathan, et al.). Research regarding this intervention presently is ongoing. Because as much as 70% of the opioid is not absorbed systemically, few, if any, side effects are seen (Coyne, Viswanathan, et al.).

In the Medical College of Virginia Hospitals and Virginia Commonwealth University, nebulizer fentanyl is an intervention used with any patient experiencing ongoing dyspnea regardless of its etiology. The standard dose used in this facility is 25 mcg of fentanyl with 2 ml of normal saline administered every two to three hours as needed. The nursing staff, rather than respiratory therapists, administers the medication because fentanyl is a controlled substance. Nurses using this intervention should evaluate patients for subjective and objective improvements in dyspnea. The only known contraindication to nebulized fentanyl is an allergy to fentanyl.

The treatment of dyspnea remains a problem for many patients. Research clearly is needed to improve the current interventions. With regard to the management of dyspnea with nebulized fentanyl, healthcare providers need to determine the half-life of nebulized fentanyl, whether it is safe when given more frequently than every two to three hours, and whether this treatment can be used in the homecare setting and administered by family and caregivers. Patients experiencing dyspnea require ongoing support and thorough assessment to ensure maximum comfort is achieved and maintained.

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