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## ⊗ Respiratory Suffering in the ICU: Time for Our Next Great Cause

Dyspnea, or breathlessness, ranks among the worst suffering that a human being can experience. Although it is similar to pain in many ways, dyspnea differs from pain in its terrifying dimension. Having trouble taking a breath in, experiencing an unquenchable thirst for air, or feeling one's chest constricted immediately summons an existential fear, the fear of dying. This makes the relief of dyspnea a primary concern, anchored not only to clinical obligation but also to universal ethical and moral considerations (1, 2).

Relief of dyspnea implies its recognition. When the dyspneic patient can talk, the patient's own report of having difficulty breathing is emphasized in the current operational definition of dyspnea (3). It is straightforward to elicit, if one takes the trouble to do so (4). When verbal communication is impaired for whatever reason, dyspnea-related clinical manifestations can be missed. Dyspnea then remains occult (5), compounding the perception of an existential threat with a sensation of powerlessness. This leads to panic and is a clear recipe for post-traumatic stress disorder (1). Yet there are many nonverbal dyspnea-related signs (neurovegetative, behavioral, and emotional) that allow the identification of breathlessness in noncommunicative patients (6–9).

In this issue of the *Journal*, Gentzler and colleagues (pp. 1377–1384) confirm that dyspnea is as frequent a problem for patients in the ICU as pain (10). In their study, moderate to severe dyspnea was reported by 47% of patients, and 41% of patients reported pain. One of their most striking findings is that the performance of nurses in identifying dyspnea was relatively poor; personal caregivers performed much better. Personal caregivers' ratings of dyspnea agreed well with the patients' own ratings, but this was far from being the case for the nurses' ratings. The poor aptitude of nurses, physiotherapists, and physicians in identifying dyspnea in their patients has been described before (11–13), but this is the first time that a comparison has been conducted with the corresponding

aptitude of personal caregivers, who, notably, never failed to detect dyspnea.

Improving the performance of ICU personnel in identifying dyspnea and evaluating its severity therefore seems necessary. Implementing systematic dyspnea assessments in routine clinical care (as for pain) could be useful (14), and such routine assessments seem readily acceptable to nurses (15). Generalizing the use of observational scales (and particularly their simplified ICU versions [7–9]) could also be useful (16). Specific studies should be designed to determine the potential benefits of such approaches. Electromyographic and electroencephalographic techniques offer the prospect of improving this process by providing surrogate biomarkers of dyspnea (17–19).

But identifying dyspnea is not enough. It is necessary to do something about it. Perhaps the most important finding of the study by Gentzler and colleagues is that nurse detection of moderate-to-severe dyspnea was not associated with any therapeutic action, such as administering bronchodilators or opioids, adjusting ventilator settings, or changing the respiratory device altogether. This stood in contrast to pain, whose detection was significantly associated with opioid treatment. This finding is not completely surprising. A recent survey showed that clinicians confronted with theoretical cases of chronic pain or “chronic breathlessness” (20), or “persistent breathlessness” (21), acted far more on the pain than on the dyspnea (22). The term “invisibility of dyspnea” was coined to describe the lack of response of caregivers to dyspnea, or even their avoidance of it (23, 24). There are several possible reasons for this surprising observation. First, dyspnea, in contrast to pain, is not a universal experience. The shortness of breath that healthy people experience during exertion cannot be compared with pathological breathlessness (25). It is unthreatening—it can even be satisfactory—and it can be controlled by reducing the intensity of exertion. It is thus likely that it is more difficult for a caregiver to identify with the suffering of dyspnea than with the suffering of pain. Second, and also in contrast to pain, there are no firmly established guidelines to manage dyspnea in ICU patients. This can make caregivers feel helpless and, as a reaction, favor avoidance. The nurses in Gentzler and colleagues study emphasized that dyspnea presented a greater challenge to symptom management than pain, yet dyspnea in mechanically ventilated patients

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can be alleviated by simple means, such as adjusting ventilator settings (26), or other simple “pathophysiological” means, such as suctioning an encumbered endotracheal tube, reducing the ventilatory drive through the correction of acidosis or anemia, etc. (26). Furthermore, interventions that are known to relieve chronic breathlessness—be they pharmacological (e.g., opioids) or not (e.g., stimulation of trigeminal receptors by a fan-generated flow of air [27, 28])—should be equally as effective for persistent dyspnea in an ICU setting. Third, observing dyspnea in others can have negative psychological consequences (29). Kentish-Barnes and colleagues (30) observed that the relatives of patients who died in the ICU developed post-traumatic stress disorder more frequently when they had seen their relative have trouble breathing. This phenomenon can drive caregivers away from the patients, all the more so if they do not understand the reason for their uneasiness. All of these factors can be addressed through education, training, and research, as exemplified in a pilot study that evaluated the effects of an educational program on the performance of nurses in identifying dyspnea (31).

Gentzler and colleagues’ study has some clear limitations. The sample size was quite small, and it is possible that a larger study would have found that personal caregivers overdetect dyspnea. The patients’ self-ratings may be questioned, as mental status was not specifically assessed. The potential treatments available to the nurses to relieve dyspnea were not systematically inventoried. Finally, only 65% of the patients were mechanically ventilated, but it is in precisely this population that the detection of dyspnea is most challenging.

Nevertheless, the study by Gentzler and colleagues is an urgent call to action to all those involved in the care of dyspneic patients, whether in the ICU or elsewhere, to make this neglected suffering an absolute priority. Some actions are immediately possible, at no cost and with no risks: we should systematically ask about dyspnea (4), look for its telltale surrogate clinical signs (8), and correct obvious physiological abnormalities (26). Although effectiveness studies of interventions targeting persistent dyspnea in the ICU are awaited, it should easily be possible to provide some relief to dyspneic ICU patients just by addressing the vicious circle of dyspnea leading to anxiety leading to dyspnea. Willingly approaching dyspneic patients with the aim of restoring some degree of control by offering reassurance and empathy is also likely to be effective (1, 32). As Gentzler and colleagues emphasize in their CONCLUSION, measures to combat dyspnea in ICU patients should be as routine as those used for the detection and treatment of pain. The struggle for “respiratory felicity” in our patients (33) is basically also a struggle for a human right (1, 2), and a responsibility that no professional caregiver can evade. ■

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## ⊗ Reduced Lung Function in Midlife and Cognitive Impairment in the Elderly

In recent years, the interpretation of respiratory diseases has shifted from localized entities to single components of systemic multimorbidities (1, 2). Respiratory diseases were first linked to cardiovascular and metabolic diseases (3, 4) and later also to cognitive disorders (5).

In a study presented in this issue of the *Journal*, Lutsey and colleagues (pp. 1385–1396) used a community-based cohort enrolled within the framework of the ARIC (Atherosclerosis Risk in Communities) study (6) to address the association between respiratory and neurological disorders (7). They found that “both restrictive and, to a lesser extent, obstructive lung disease were associated with greater risk of incident dementia and mild cognitive impairment (MCI)” after a 27-year follow-up. Lung function parameters (FEV<sub>1</sub>% predicted and FVC% predicted) were significantly associated with cognitive impairment due to both Alzheimer’s disease and cerebrovascular disease, although the latter association was much stronger than the former (Tables 4 and 5 in Reference 7).

The present results confirm and enlarge the findings of a previous longitudinal ARIC study (5), which found that a restrictive ventilatory pattern, but not an obstructive pattern, was associated with reduced cognitive scores and a higher risk of hospitalization for dementia. The present study, using a longer follow-up and also including patients with stroke or coronary artery diseases, managed to show that a restrictive pattern was associated with cognitive impairment 27 years later, and that an

obstructive pattern also significantly affected cognitive status, although to a lesser extent. Of note, the two studies used different cutoffs to define airways obstruction: a fixed FEV<sub>1</sub>/FVC ratio of 0.70 in the previous study (5), and the lower limit of normal in the present study. Interestingly, the latter classification has been shown to select more severe cases of airways obstruction in the elderly (8).

Both ARIC studies support the notion that a restrictive pattern plays a stronger role than an obstructive pattern in cognitive impairment. In agreement with current literature (9), the restrictive pattern was strongly associated with all of the features of metabolic syndrome in the current study: at baseline, subjects with a restrictive pattern had a mean body mass index of 30.3, 36.2% were treated with antihypertensive medications, and 22.4% had diabetes, and they had lower high-density lipoprotein cholesterol and higher low-density lipoprotein cholesterol than the other subjects. In a multivariable analysis, the association between restrictive impairment and dementia/mild cognitive impairment persisted even after adjustment for 15 well-known cardiovascular risk factors, although the odds ratio (OR) decreased from 1.92 (95% confidence interval [CI], 1.40–2.63) to 1.56 (95% CI, 1.12–2.16) (Table 3 in Reference 7). This suggests that the relation between restrictive pattern and cognitive impairment is partly mediated by metabolic/cardiovascular comorbidities. On the other hand, the strength of the association between obstructive pattern and cognitive impairment was much weaker (OR, 1.30; 95% CI, 1.07–1.60), but remained unchanged when adjusting for the same cardiovascular risk factor (OR, 1.31; 95% CI, 1.06–1.62).

The authors adopted an interesting study design by integrating information from administrative databases with information from an *ad hoc* comprehensive neurocognitive exam. The use of administrative databases allowed the authors to study the

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