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ORIGINAL ARTICLE

Contributors to fatigue in patients receiving mechanical ventilatory support: A descriptive correlational study

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Summary
Objectives: To describe levels of fatigue and explore clinical factors that might contribute to fatigue in critically ill patients receiving mechanical ventilation.
Research methodology/design: Descriptive, correlational design. Sample was a sub-set of patients enrolled in a randomised clinical trial testing patient-directed music for anxiety self-management. Clinical factors included age, gender, length of ICU stay, length of ventilatory support, illness severity (APACHE III), and sedative exposure (sedation intensity and frequency). Descriptive statistics and mixed models were used to address the study objectives.
Setting: Medical and surgical intensive care units in the Midwestern United States.
Main outcome measures: Fatigue was measured daily via a 100-mm Visual Analogue Scale, up to 25 days.
Results: A sample of 80 patients (50% female) receiving ventilatory support for a median 7.9 days (range 1—46) with a mean age of 61.2 years (*SD* 14.8) provided daily fatigue ratings. ICU admission APACHE III was 61.5 (*SD* 19.8). Baseline mean fatigue ratings were 60.7 (*SD* 27.9), with fluctuations over time indicating a general trend upward. Mixed models analysis implicated illness severity ($\beta(\text{se}(\beta)) = .27(.12)$) and sedation frequency ($\beta(\text{se}(\beta)) = 1.2(.52)$) as significant contributors to fatigue ratings.
Conclusion: Illness severity and more frequent sedative administration were related to higher fatigue ratings in these mechanically ventilated patients.

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Implications for Clinical Practice

- Patients receiving prolonged periods of mechanical ventilatory support report moderate levels of fatigue.
- Illness severity and frequent receipt of sedative medications are clinical factors that contribute to fatigue.
- Interventions need to be designed and tested that target clinical factors amenable to treatment to manage fatigue.
- It is not known if fatigue ratings influence salient patient outcomes.

Introduction

Fatigue can be defined as a general overall feeling of tiredness and/or decreased energy level, but not necessarily sleepy (http://www.npcrc.org/files/news/edmonton_symptom_assessment_scale.pdf). The symptom of fatigue and its contributors are well documented in persons with cancer, as are interventions to assist these patients with management of this common and debilitating symptom (Delgado-Guay et al., 2009; Henry et al., 2008; Poirier, 2013). Fatigue in cancer patients is subjective and multidimensional, related to the disease itself as well as the side-effects from medications and treatments. In addition, pain, emotional distress, and anaemia contribute to fatigue in cancer patients (Poirier, 2013). In patients who are critically ill, the literature documents that these patients often report feeling ''tired'' (Matthews, 2011; Puntillo et al., 2010), however, little is known about the self-rating of fatigue and its potential clinical contributors, particularly in those ICU patients receiving mechanical ventilation. Sleep disturbances and fatigue can be intertwined in ICU patients, and fatigue can impact a patient's ability to participate in one's care (Matthews, 2011). One of the few studies reporting symptom assessment in critically ill patients revealed that 75% of participants reported being tired (Puntillo et al., 2010). This descriptive study did not aim to determine the source of fatigue or any clinical covariates that might be associated with this symptom. Fatigue, conceptualised as tiredness, was the most frequently occurring, intense, and distressful symptom reported by the study participants (Puntillo et al., 2010). However, a majority of the participants (65%) were not receiving mechanical ventilatory support. Screening, evaluation, and management of fatigue are thought to be suboptimal in the critical care setting (Matthews, 2011), with little information specifically in patients receiving the common supportive modality of mechanical ventilation. A description of fatigue and potential clinical factors that contribute to this vague, yet common symptom in critically ill patients is needed before interventions can be designed and tested to manage this common symptom. Thus, the following study was undertaken to begin to fill this knowledge gap by describing fatigue ratings and determining if any clinical variables are related to fatigue in critically ill patients receiving mechanical ventilatory support.

Methods

Aims/design

The aims of this descriptive, correlational study were to: (1) describe levels of fatigue over the course of mechanical ventilatory support, and (2) explore if selected clinical factors contribute to fatigue ratings in a sample of critically ill patients receiving mechanical ventilation. Participants in this study consisted of a subset of patients enrolled in a randomised clinical trial testing patient-directed music for anxiety self-management and sedative exposure reduction in patients receiving mechanical ventilatory support. Patients were randomised to one of three conditions: (1) experimental self-initiated music listening with preferred music whenever desired for as long as desired each day enrolled on protocol; (2) active control of noise-cancelling headphones that patients wore whenever quiet time was desired as frequently and for as long each day enrolled on protocol; and, (3) usual care for the respective ICU. Details on the findings from the parent study are reported elsewhere (Chlan et al., 2013).

Setting

Patients receiving mechanical ventilatory support for a pulmonary indication were enrolled from one of 12 ICUs in the urban Midwest of the United States. These ICUs were a mix of medical and medical-surgical ICUs where patient care was delivered by specially trained nurses in a one nurse to two patient ratio.

Ethical approval

Approval for the use of human subjects in research was obtained from the parent study's institutional review board and from the participating sites human subjects' committees. Trained research nurses obtained all informed consent and collected all study data.

Participants

To be eligible for the parent study, patients receiving acute mechanical ventilatory support on the participating ICUs had to be alert, interacting appropriately with ICU nursing staff, and provide their own informed consent. Patients who were receiving aggressive ventilatory support, were haemodynamically unstable, or had documented mental incompetence (Alzheimer's disease) were not approached for study participation. Participants remained enrolled on protocol in the parent study as long as they were receiving ventilatory support, up to 30 days, or until extubated, chose to withdraw, were transferred from the ICU, or died.