Title:
Meta-Analysis of the Effects of Early Mobilization on Mechanically Ventilated Patients

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Session Title:
Health Promotion in the ICU
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Keywords:
ICU, Mobilization and Ventilator

References:


**Abstract Summary:**
So far, there is no meta-analysis for early mobilization intervention of mechanically ventilated patients in the ICU setting has done. This provided the statistic synthesis for this intervention. This meta-analysis highlight the gap in the literature regarding this population.

**Learning Activity:**

<table>
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<tr>
<th>LEARNING OBJECTIVES</th>
<th>EXPANDED CONTENT OUTLINE</th>
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<tr>
<td>The learner will be able to illustrate the overall effect of early mobilization intervention of</td>
<td>This content would be covered through explaining the Meta-analysis synthesis and result</td>
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mechanically ventilated patients on different outcomes.

The learner will be able to highlight the gap in the literature regarding early mobilization intervention for the mechanically ventilated patients.

Abstract Text:

Background

Patients in the intensive care unit (ICU) can become inactive because they are either on mechanical ventilators (MV) or on different pharmacology agents, such as vasopressors, corticosteroids, muscle relaxants, or antibiotics. Muscle wasting occurs quickly in the ICU setting and has the highest chance of occurrence during the first 2 or 3 weeks of patients’ ICU stays. Muscle atrophy is associated with a long duration on MVs and long ICU stay (LOS). It increases patients’ mortality rates and decreases their physical condition and quality of life (QoL). Recently, early mobilization and rehabilitation have been advocated as techniques to prevent muscle atrophy. Several studies have focused on the effects of early mobilization on mechanically ventilated patients.

Purpose

The purpose of this paper is to analyze the effects of early mobilization on outcomes of mechanically ventilated patients in medical and surgical ICU settings. I focus on the duration of mechanical ventilation, the number of ventilator-free days, ICU and hospital LOS, QoL, muscle strength, physical function.

Method: a comprehensive electronic search of the PubMed, CINAHL, and EMBASE databases using “early physical therapy,” “early mobilization,” “early ambulation,” “mechanical ventilation,” “acute respiratory failure,” and “critically ill patients” as MeSH terms or as terms within article titles and abstracts. I also used “OR” and “AND” in my article search. The publication years I chose were those between 1983 and 2017.

Inclusion and Exclusion Criteria: the search criteria was limited to include only randomized controlled trials written in English. The inclusion criteria for the meta-analysis were studies that delivered early mobilization (EM) or early physical therapy for mechanically ventilated patients between ages 18 and 65 in either medical or surgical ICU settings in North America, Europe, and Australia. The exclusion criteria were studies that investigated passive therapy or functional electrical muscle stimulation as patients’ sole rehabilitation sources, and studies that combined the intervention of mobilization with cognitive therapy and compared them as standards of care.

Analysis: the comprehensive meta-analysis program Version 3 was used to deliver the meta-analysis. The random effect model was used because there were large variations in the type, duration, frequency, and intensity of the articles’ EM interventions.

Results: Eight studies fulfilled the inclusion and exclusion criteria. The total sample size for all eight studies was n = 1064 (Intervention = 522, Standard of care = 519), and it ranged from 50 to 300. The overall mean age for the trials for intervention vs. standard of care was 59.8 vs. 57.6 years, respectively. The overall percentage of females for all the EM vs. SCG studies was 44% vs. 42.6%. Three trials recruited patients from mixed ICU, two from general ICUs, two from medical ICUs, and one from surgical ICU. The trials were conducted in different countries: three in the United States, two in Australia, and one in Belgium. Two trials were conducted in multiple countries. EM had a significant effect on the patients’ ICU and hospital LOS ([pooled Hedges g = -0.19, 95 percent CI -0.35, -0.04, P = 0.015] and [pooled...)}
Hedges $g = -0.21$, 95% CI $-0.35$, $-0.07$, $P = 0.003$, respectively. Also, EM produced a significant effect on patients’ QoL at 6 months after their discharge from the hospital (pooled Hedges $g = 7.29$, 95 percent CI $-11.99$, $-2.59$, $P = 0.002$). On the other hand, the meta-analysis did not show any significant effect on MV duration, the number of ventilator-free days, vasopressors, sedation, delirium, patients’ physical function, or patients’ QoL at the hospital discharge or 3 months after the discharge.

**Conclusion:** Mobilizing mechanically ventilated patients reduces the ICU and hospital LOS, and it appears to produce significant benefits for patients on MVs in ICUs. However, we need more RCTs to show the effect of this intervention on the rest of the outcomes, especially patients’ muscle strength and QoL.