Body weight-supported bedside treadmill training facilitates ambulation in ICU patients
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Body weight-supported bedside treadmill training facilitates ambulation in ICU patients: An interventional proof of concept study

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Background

- Intensive Care Unit-acquired weakness (ICU-AW) is associated with short- and long- term physical impairments and impaired functional status.
- Early mobilisation and ambulation of patients admitted to the ICU improve functional recovery.
- Severe weakness in combination with tubes, lines and machinery are practical barriers for the implementation of ambulation of critically ill patients.

Objective

- To explore the feasibility of Body Weight-Supported Treadmill Training (BWSTT) at the bedside in the ICU.

Methods

- Single centre interventional study
- Tertiary 34-bed mixed medical-surgical ICU of the Academic Medical Center, University of Amsterdam, the Netherlands

Inclusion criteria:
- Adult ICU-patients, mechanically ventilated for ≥ 48 hours
- No contra-indication for mobilisation or activation
- Able to follow instructions
- Muscle strength m. quadriceps MRC ≥ 2
- Independent sitting balance

Measurement

- Feasibility was evaluated according to:
  - Eligibility
  - Successful number of BWSTT
  - Number of staff needed
  - Adverse events
  - Number of patients that could not have walked without BWSTT
  - Patient satisfaction and anxiety

Intervention

- The BWSTT enables ambulation at the bedside within the range of ventilator tubes, lines and monitoring equipment.
- In patients with insufficient motor control or muscle strength for ambulation, a harness is used in combination with a weight bearing construction.

Results

Patients characteristics at the first time of BWSTT

<table>
<thead>
<tr>
<th>Characteristics of ICU treatment devices during BWSTT</th>
</tr>
</thead>
<tbody>
<tr>
<td>Continuous monitoring</td>
</tr>
<tr>
<td>20 (100%)</td>
</tr>
<tr>
<td>Patients with mechanical ventilation</td>
</tr>
<tr>
<td>4 (20%)</td>
</tr>
<tr>
<td>Patients with tracheostomy</td>
</tr>
<tr>
<td>8 (40%)</td>
</tr>
<tr>
<td>Surgical wounds</td>
</tr>
<tr>
<td>- Sternotomy</td>
</tr>
<tr>
<td>11 (55%)</td>
</tr>
<tr>
<td>- Abdominal</td>
</tr>
<tr>
<td>6 (55%)</td>
</tr>
<tr>
<td>- Neck</td>
</tr>
<tr>
<td>3 (27%)</td>
</tr>
<tr>
<td>- Infusion lines or drains</td>
</tr>
<tr>
<td>20 (100%)</td>
</tr>
</tbody>
</table>

Results

- BWSTT was performed in:
  - 20 patients and 54 sessions
  - 53 sessions were successfully performed
- Two numbers off staff needed
- BWSTT is feasible and safe:
  - Median treatment time 25 minutes
  - No adverse events
  - Patients are not anxious
  - Patients are very satisfied
  - All patients were not able to walk or would have walked shorter distance without the BWSTT

Conclusion

- BWSTT is feasible and safe and facilitates early ambulation with critically ill patients in the ICU.
- To perform BWSTT less staff is needed compared to ambulation without BWSTT.

References

- Sommers J, Clinical Rehabilitation. 2015; DOI: 10.1177/0269215514567196

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