Measuring electrical activity of the diaphragm on the ICU

No registrations found.

Ethical review	Positive opinion
Status	Recruiting
Health condition type	-
Study type	Observational non invasive

Summary

ID

NL-OMON20779

Source Nationaal Trial Register

Brief title SEDICU

Health condition

patient-ventilator dyssynchrony, prolonged mechanical ventilation, muscle weakness, weaning

Sponsors and support

Primary sponsor: Academic Medical Center, Amsterdam Source(s) of monetary or material Support: Academic Medical Center, Amsterdam

Intervention

Outcome measures

Primary outcome

-Correlation of transcutaneous sEMG of the diaphragm with airway pressure and flow to detect -patient – ventilator dyssynchrony

-Correlation of transcutaneous sEMG of the diaphragm with EAdi signal of NAVA catheter.

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-Changes in sEMG signals during increased physical activity

-Correlation of sEMG fatigue parameters with clinical parameters of fatigue during weaning from mechanical ventilation

Secondary outcome

Feasibility of sEMG on the ICU

Study description

Background summary

Patients on the intensive care unit often need mechanical ventilation. Mechanical ventilation is harmful for the diaphragm. This leads to diaphragmatic dysfunction and weakness. One of the causes is patient-ventilator dyssynchrony (PVD). PVD is a frequent problem on the ICU, but detection demands expertise and time. PVD can lead to prolonged mechanical ventilation and ICU stay.

In patients with diaphragmatic weakness, weaning from mechanical ventilation has to be done carefully. This time-consuming process leads to a prolonged stay on the ICU, which is associated with an increased risk of infections, mortality and increased costs.

Optimized monitoring of diaphragm function might be able to detect patient-ventilator dyssynchrony and might accelerate the weaning process and diminish the length of mechanical ventilation and ICU stay.

The electrical activity of the diaphragm (EAdi) can be detected by three electromyography (EMG) methods: transcutaneous EMG, intramuscular EMG and transesophageal EMG. Transcutaneous electromyography, also called surface electromyography (sEMG), is the least invasive method. In this pilot study we aim to investigate the additional value of sEMG signals of respiratory muscles during ICU admission in adults.

Study objective

-Surface electromyography (sEMG) of the diaphragm can detect patient-ventilator dyssynchrony

-sEMG of the diaphragm correlates with the Eadi signals of a transesophageal EMG catheter

-sEMG changes with increased physical activity on the ICU

-sEMG fatigue parameters correlate with clinical parameters of fatigue during weaning from mechanical ventilation

Study design

Recordings of 15 minutes to maximum 4 hours (depending on research question)

Intervention

Surface electromyography of the diaphragm and intercostal muscles

Contacts

Public

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Eligibility criteria

Inclusion criteria

-Consecutive patients admitted to the ICU of the Academic Medical Center Amsterdam

-Age \geq 18 years

-Expected duration of mechanical ventilation for \geq 48 hours

-Informed consent

Exclusion criteria

-(Suspected) neuromuscular disease (other than ICU-AW) or cervical spinal cord injury

-Known phrenic nerve injury

-Contraindication for electrode placement (e.g. severe skin infection at electrode site)

Study design

Design

Study type:	Observational non invasive
Intervention model:	Other
Masking:	Open (masking not used)
Control:	N/A , unknown

Recruitment

NL	
Recruitment status:	Recruiting
Start date (anticipated):	08-09-2014
Enrollment:	120
Туре:	Anticipated

Ethics review

Positive opinion	
Date:	03-09-2014
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 40797 Bron: ToetsingOnline Titel:

Other (possibly less up-to-date) registrations in this register

No registrations found.

In other registers

Register	ID
NTR-new	NL4615
NTR-old	NTR4766
ССМО	NL50006.018.14
OMON	NL-OMON40797

Study results