Evolution of diaphragm and abdominal muscle thickness in ventilated COVID-19 patients

No registrations found.

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

Summary

ID

NL-OMON21961

Source
Nationaal Trial Register

Brief title
DIACOV

Health condition

COVID-19

Sponsors and support

Primary sponsor: none
Source(s) of monetary or material Support: none

Intervention

Outcome measures

Primary outcome

Diaphragm and abdominal muscle thickness assessed by ultrasound

Secondary outcome

Duration of mechanical ventilation, reintubation rate, mortality

Study description

Background summary

Inspiratory muscle weakness develops rapidly in ventilated critically ill patients and is associated with adverse outcome, including prolonged duration of mechanical ventilation and mortality. Surprisingly, the effects of critical illness on expiratory muscle function have not been studied.
The main expiratory muscles are the abdominal wall muscles, including the external oblique (EO), internal oblique (IO) and transversus abdominis muscles (TRA). These muscles are activated when respiratory drive or load increases, which can be during e.g. exercise, diaphragm fatigue inc,reased airway resistance, or positive airway pressure ventilation.The abdominal wall muscles are also critical for protective reflexes, such as coughing. Reduced abdominal muscles strength may lead to decreased cough function and thus inadequate airway clearance. This will lead to secretion pooling in the lower airways, atelectasis, and ventilator associated pneumonia (VAP). Studies have shown that decreased cough function is a risk for weaning failure and (re)hospitalization for respiratory complications. Further, high mortality was found in patients with low peak expiratory flow.
Considering the importance of a proper expiratory muscle function in critically ill patients, it is surprising that the prevalence, causes, and functional impact of changes in expiratory abdominal muscles thickness during mechanical ventilation (MV) for critically ill patients are still unknown.
Ultrasound is increasingly used in the ICU for the visualization of respiratory muscles. In a recent pilot study we confirmed the feasibility and reliability of using of ultrasound to evaluate both diaphragm and expiratory abdominal muscle thickness in ventilated critically ill patients (manuscript in preparation). From recent data, we already acquired this information in a large cohort of ICU patients. However, little is known about the effects of COVID 19 on these muscles. Recently, a histological post mortem analysis of COVID-19 positive patients, demonstrated a high viral load in the muscle and a high degree of fibrosis and inflammation. Accordingly, the primary aim of the present study is to evaluate the evolution of diaphragm and abdominal expiratory muscle thickness during MV in adult critically ill patients and compare this data to the already analysed non-COVID 19 patients.

Study objective

In patients, ventilated for >72 hours, bigger changes in diaphragm thickness will be seen over time due to fibrosis and inflammation in patients tested positive for SARS-Corona virus 2 in comparison to those who are not infected

Study design

Daily ultrasound from Day 1 of intubation

Contacts

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Eligibility criteria

Inclusion criteria

Patients tested positive for SARS Corona Virus 2 and ventilated for >72 hours

Exclusion criteria

Extubation within 72 hours of intubation, Diaphragm paralysis, Spinal cord injury

Study design

Design

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

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	09-11-2020
Enrollment:	40
Type:	Anticipated

IPD sharing statement

Plan to share IPD: Yes

Plan description
With fellow researcher upon reasonable request

Ethics review

Positive opinion

Date:	17-11-2020
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

No registrations found.

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

No registrations found.

In other registers

Register	ID
NTR-new	NL9053
Other	METC VUMC : 2017.056

Study results