Respiratory, hemodynamic and inflammatory effects of induced HypothermiA using NoVAtherm with extra corporeal membrane ventilator iLA-Activve in patients ARDS

No registrations found.

Ethical review	Positive opinion
Status	Pending
Health condition type	-
Study type	Interventional

Summary

ID

NL-OMON26548

Source
Nationaal Trial Register

Brief title
HAVAnA trial

Health condition

Acute respiratory distress syndrome

Sponsors and support

Primary sponsor: Department of Intensive Care, Academic Medical Centre, University of Amsterdam
Source(s) of monetary or material Support: Department of Intensive Care, Academic Medical Centre, University of Amsterdam

Intervention

Outcome measures

Primary outcome

Minute volume ventilation

Secondary outcome

Hemodynamic parameters: intra-arterial systolic and diastolic pressure, cardiac output, right and left ventricular contractile function, parameters of pre-load and after-load and pulmonary arterial pressures

Ventilatory parameters: Pmax, CVD, ScvO2, PaO2, PvO2, (A-a) difference, PCO2, etCO2, tidal volumes, respiratory rate, PEEP level, pressure volume curves, compliance, work of breathing, lung injury score.

Inflammatory parameters: BALF/plasma albumin ratio, BALF and plasma levels of IL-8, TNF, IL-1, IL-6, IL-10, EA complexes, D-dimers, thrombin-antithrombin complex, PAI-1, PAA% (by ELISA).

Metabolic parameters: VO2, VCO2, EE, mitochondrial respiration, mitochondrial enzymes and mitochondrial DNA (isolated from circulating platelets).

Study description

Background summary

Rationale: In ARDS, it is often not possible to adhere to protective ventilation strategies using low tidal volumes and low peak inspiratory pressures. Induced hypothermia to 32-34□C allows for a reduction in minute volume ventilation. By using NovathermTM, cooling of patients can be combined with extracorporeal carbon dioxide removal via the iLA-Activve MinilungTM..

Objective: Does induced hypothermia using NovathermTM in combination with iLA-Activve MinilungTM result in a reduction in minute volume ventilation and work of breathing in patients with ARDS?

Study design: Randomized controlled open label trial

Study population: Mechanically ventilated patients with ARDS admitted to the Intensive Care Unit.

Intervention (if applicable): CO2 removal using iLA-Activve MinilungTM, with or without induced hypothermia to 32-34 ºC, during 12 hours.

Main study parameters/endpoints: Minute Volume Ventilation

Nature and extent of the burden and risks associated with participation, benefit and group relatedness: To connect the iLA-Activve MinilungTM device, a double lumen cannula of 18 French Gauge will be inserted in the jugular or femoral vein under ultrasound guidance. Participants will donate a total 30 ml of blood and will undergo non-invasive measurements, such as calorimetry and echocardiography. Since this patient population with severe acute respiratory distress syndrome will need mechanical ventilation, this study can only be executed at an intensive care unit, with sedated patients. There are clear possible benefits in participation, as the treatment under investigation may improve hemodynamic, respiratory and inflammatory parameters. There is a risk of adverse events, including bleeding or thrombosis.

Study objective

Induced hypothermia to 32-34 degree Celsius using NovathermTM with extracorporeal iLA-Activve MinilungTM allows for a reduction in minute volume ventilation needed for adequate gas exchange in patients with ARDS, with a concomitant decrease in work of breathing and increase in pulmonary compliance, resulting in less lung injury and less time on the ventilator.

We furthermore hypothesize that reducing minute volume ventilation by reducing positive peak inspiratory pressure levels using NovathermTM combined with the iLA-Activve MinilungTM will result in an increase in cardiac output and right ventricular function.

Study design

Before connection to the iLA-Activve MinilungTM, at 2 hours and 24 hours after the initiation of treatment, a two dimensional transthoracic echocardiography (TTE) will be carried out. Cardiac output will be estimated with a combined two dimensional (2D) and Doppler approach, which allows calculation of the stroke volume. Also, E/A ratio will be estimated as well as pulmonary pressures.
At the same time points, energy expenditure will be measured using indirect calorimetry. After completion of the study protocol, a non-directed mini broncho-alveolar lavage (miniBAL) will be performed by instilling 20 cc of normal saline in the lung via the endotracheal tube, after which fluid will be retrieved.

At start of treatment and after 24 hours of start of treatment, blood will be drawn form an intra-arterial catheter which is already in place as part of ICU standard care. In total a maximum of two times 15 ml of blood will be drawn.
Patients receiving hypothermia are sedated and passively rewarmed at 1 degree Celsius per

hour, after the period of hypothermia. Control patients and patients, using the MinilungTM while maintaining normotemperature during at least 12 hours; receive no additional sedation, if not required according to the treating physician.
In control patients receiving standard care, echocardiography, calorimetry, miniBAL and blood drawn will be performed at same time points, after randomization.

Intervention

CO2 removal using iLA-Activve MinilungTM, with or without induced hypothermia to 32-34 ºC, during 12 hours.

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Eligibility criteria

Inclusion criteria

Inclusion criteria

- Suffering of a clinical condition associated with ARDS

- ARDS according to the Berlin definition [11] (P/F < 200 with PEEP > 5 cmH2O; bilateral pulmonary opacities at chest X-ray; respiratory failure not fully explained by cardiac failure or volume overload)

- Mechanical ventilation with maximum inspiratory pressure levels (Pmax) of > 30 cm H2O, while maintaining tidal volume ventilation of 6-8 ml/kg ideal body weight and permissive hypercapnia with an arterial pH < 7.35.

Exclusion criteria

4.3 Exclusion criteria

A potential subject who meets any of the following criteria will be excluded from participation in this study:

- Contra-indication for (low dose of) heparin

- Severe shock, requiring norepinephrin dose of > 25 µg/kg/hour

- Severe hypoxia, requiring referral for extra corporeal membrane oxygenation

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Open (masking not used)
Control:	Active

Recruitment

NL

Recruitment status:	Pending
Start date (anticipated):	04-07-2013
Enrollment:	30
Type:	Anticipated

Ethics review

Positive opinion

Date:	29-11-2013
Application type:	First submission

Study registrations

Followed up by the following (possibly more current) registration

ID: 39735
Bron: ToetsingOnline
Titel:

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

No registrations found.

In other registers

Register	ID
NTR-new	NL4148
NTR-old	NTR4349
CCMO	NL42038.018.12
ISRCTN	ISRCTN wordt niet meer aangevraagd.
OMON	NL-OMON39735

Study results

Summary results
N/A