CYtosorb modulation of surgiCal infLammatiON during LVAD insErtion (CYCLONE-LVAD)

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Ethical review	Approved WMO
Status	Recruiting
Health condition type	Heart failures
Study type	Interventional

Summary

ID

NL-OMON56723

Source
ToetsingOnline

Brief title
CYCLONE-LVAD

Condition

- Heart failures
- Cardiac therapeutic procedures

Synonym
Heart failure

Research involving
Human

Sponsors and support

Primary sponsor: Imperial College London
Source(s) of monetary or material Support: ABBOTT via Vrienden van het UMCU

Intervention

Keyword: cytokines, Haemadsorption, LVAD, SIRS

Outcome measures

Primary outcome

The main study parameter is the change in plasma IL-6 concentration from the start of surgery, end of cardiopulmonary bypass procedure, at skin closure and at 6, 12, 24, 48 and 72 hours postoperatively.

Secondary outcome

Secondary endpoints:

• Assessment of serious device related adverse events (Time Frame: from time of enrolment through ICU discharge)

• Feasibility measures: efficacy of screening, recruitment, randomization, willingness of surgeons and anaesthetists/intensivists to participate, perfusionist experience

• Incidence and progression of vasoplegia up to 3 days after surgery

• Incidence and progression of RV dysfunction until hospital discharge

• Incidence and progression of liver dysfunction until ICU discharge

• Incidence and progression of AKI until ICU discharge

• Duration of invasive mechanical ventilation

• Length of ICU stay and hospitalisation

• 30 day mortality

• Adverse event rates

• Vital signs

• Safety laboratory assessments

Mechanistic Biobank and Physiology endpoints

• Perioperative plasma and urine pro-and anti-inflammatory cytokine response

• Activation of coagulation, fibrinolysis and the complement cascade

• Perioperative leukocyte activation, degranulation

• Perioperative endothelial dysfunction and degradation of glycocalix

• Global metabolic phenotypic alterations

• Assessment of microcirculation

Study description

Background summary

Mechanical circulatory support, specifically implantable continuous flow left ventricular assist device (CF-LVAD) therapy has been established as a viable treatment for rapidly deteriorating patients suffering from end stage heart failure either as bridge or alternative to heart transplantation. However, a large proportion of these patients experience severe complications in the early postoperative period including right ventricular failure or multi organ failure leading to increased mortality. The leading theory explaining these complications involves exaggerated systemic inflammatory response prior to, during and early after CF-LVAD insertion. Among the cytokines IL-6 appears to play a major role. There is increasing demonstration of the efficacy of a cytokine haemoadsorption (HA) technology in attenuating cytokine response and particularly IL-6 in various inflammatory states and emerging data on the safety of the Cytosorb® device in routine and complex cardiac surgery.
We hypothesize that Cytosorb® treatment is feasible and safe in heart failure patients undergoing LVAD insertion and that it is effective in attenuating IL-6 secretion with benefit in the wider inflammatory and metabolic response to this high-risk surgery.

Study objective

The four principle objectives of this study are:
1. To investigate the efficacy of Cytosorb® treatment in attenuating perioperative changes in IL-6 during CF-LVAD implantation
2. To investigate the feasibility, and safety of Cytosorb® treatment during CF-LVAD implantation.
3. To pilot the effect of Cytosorb® treatment on vasoplegia and organ

dysfunction with specific focus on right ventricle failure, liver failure and acute kidney injury (AKI).
4. To establish a collaborative biobank of patient*s biological samples to allow extensive characterisation of patient phenotype prior to CF-LVAD implantation and their individual inflammatory and metabolic responses to surgery and perioperative management.

Study design

A prospective randomised, two-arm, patient-blinded feasibility clinical study.

Intervention

Subjects will be randomized in a 1:1 ratio to either standard of care (SOC) alone or standard of care and treatment with the Cytosorb® device. The haemadsorption treatment will be instituted during cardiopulmonary bypass.

Study burden and risks

The burden and risks associated with participation in this trial are limited. Multiple studies have been performed with the haemoabsorption device and thus far, no serious adverse events associated with Cytosorb ® have been reported. This remains, however, a safety and feasibility experiment, since Cytosorb ® has never been tested during the implantation of CF-LVAD. Patients will be asked to participate in this study during their scheduled out-patient appointment and follow-up lasts for 30 days or up until discharge (if discharge happens earlier than 30 days postoperatively). No additional visits to the hospital for the purpose of this trial are required. Diagnostic tests including laboratory studies are mostly already part of the standard of care. For the biobank repository part of this study, patient blood and urine will be collected at several time-points (start of surgery, end of cardiopulmonary bypass, at skin closure, and 6, 12, 24, 48 and 72 hours after operation), and processed for storage in the study biobank. In order to minimise the burden to the participating patients, material will be collected from suitable access points that are already in place (e.a. arterial or central venous lines). Ten ml blood will be processed in EDTA and heparin containing test tubes, and the supernatant plasma samples will be stored in 1 ml aliquots for subsequent biobanking and analysis.

Contacts

Public
Imperial College London

Norfolk Place -
London W21PG
GB
Scientific
Imperial College London

Norfolk Place -
London W21PG
GB

Trial sites

Listed location countries

Netherlands

Eligibility criteria

Age
Adults (18-64 years)
Elderly (65 years and older)

Inclusion criteria

Adult patients (>=18 years), but <=70 years;
Scheduled for elective CF-LVAD implantation with the use of cardiopulmonary bypass;
Written informed consent for participation.

Exclusion criteria

- Poor spoken and/or written language comprehension
- Declined or missing informed consent
- LVAD implant planned without use of CPB
- Total Artificial Heart implantation
- Planned CPB temperature*<*32 °C
- AIDS with a CD4 count of*<*200/µL
- Severe thrombocytopenia (PLT <50000/microliter)
- Application of contrast medium on the day of surgery
- Immunosuppressive therapy or long-term therapy with corticosteroids
- Contraindication to anticoagulation with heparin

- Patients receiving anticonvulsive therapy, including carbamazepine, lamotrigine, oxcarbazepine, phenytoin, quetiapine and valproat
• Participation in another clinical intervention trial

Study design

Design

Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)

Primary purpose: Treatment

Recruitment

NL

Recruitment status:	Recruiting
Start date (anticipated):	05-12-2024
Enrollment:	30
Type:	Actual

Medical products/devices used

Generic name:	Cytosorb
Registration:	Yes - CE intended use

Ethics review

Approved WMO Date:	17-04-2024
Application type:	First submission
Review commission:	METC NedMec
Approved WMO Date:	24-10-2024
Application type:	Amendment
Review commission:	METC NedMec

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
ClinicalTrials.gov	NCT04596813
CCMO	NL78501.041.21