Gaseous oxygen enrichment before implantation as a means of improving organ function in liver transplantation

Submission date	Recruitment status No longer recruiting	[X] Prospectively registered		
14/06/2011		[X] Protocol		
Registration date	Overall study status	Statistical analysis plan		
12/07/2011	Completed	[X] Results		
Last Edited	Condition category	[] Individual participant data		
19/08/2019	Surgery			

Plain English summary of protocol

Background and study aims

A major and increasing problem in liver transplantation is the shortage of donor livers, which forces the use of lower quality organs for transplantation (e.g. donor's age over 65). New techniques are therefore needed to preserve donor livers before implantation. Treating the organs with oxygen gas (oxygenation) not only maintains the cell structures of the treated organ but also enables the repair of damaged structures. The aim of this study is to assess the effectiveness of short-term oxygenation (performed for 2 hours immediately before transplantation) in liver preservation to improve organ function especially during the critical first three days after transplantation.

Who can participate?

Patients over 18 years of age scheduled for their first liver transplantation

What does the study involve?

Participants are randomly allocated to one of two groups. For one group the donor liver is oxygenated for two hours before implantation. The other group receive standard care (cold storage of the donor liver without further treatment before implantation). Blood samples are taken daily for the first six days following surgery, at the day of discharge from the hospital and at each follow-up visit (every three months for up to three years). Complications reported by the participant are recorded at the day of discharge and at each follow-up visit. To assess the effectiveness of the treatment we measure blood values reflecting the quality of liver function, the duration of intensive care needed after surgery, and the rate of further transplants and deaths during the three months following transplantation.

What are the possible benefits and risks of participating? Not provided at time of registration

Where is the study run from? University Hospital of Essen (Germany)

When is the study starting and how long is it expected to run for? August 2011 to September 2013

Who is funding the study? Deutsche Forschungsgemeinschaft (German Research Community) (Germany)

Who is the main contact? Prof. Dr. med. Andreas Paul andreas.paul@uk-essen.de

Contact information

Type(s)

Scientific

Contact name

Prof Andreas Paul

Contact details

University of Duisburg-Essen Hufelandstrasse 55 Essen Germany 45122

andreas.paul@uk-essen.de

Additional identifiers

Protocol serial number N/A

Study information

Scientific Title

Randomized controlled clinical trial to investigate oxygen persufflation as adjunct in liver preservation

Acronym

OPAL

Study objectives

Vascular oxygen persufflation of liver grafts in hypothermic condition performed for 2 hours prior to implantation maintains cell and organ integrity and function and also enables to some extend the repair of damaged structures and restoration of cellular ion and signal homeostasis. Thus the rate and severity of early graft dysfunction events can be lowered and the viability of marginal quality grafts increased. The aforementioned effects have been shown in a large animal model. The safety of the procedure and its applicability to the human situation has already been demonstrated as well. This trial is designed as a final proof-of-concept study aiming to establish oxygen persufflation as valuable adjunct in clinical liver preservation.

Ethics approval required

Old ethics approval format

Ethics approval(s)

Ethics Committee, Medical Faculty, University of Duisburg-Essen (Ethik-Kommission der Medizinischen Fakultät der Universität Duisburg-Essen), 10/01/2011, ref: 09-4281

Study design

Single-center randomized controlled single-blind clinical proof-of-concept study with two parallel arms

Primary study design

Interventional

Study type(s)

Treatment

Health condition(s) or problem(s) studied

Preservation and implantation of liver grafts

Interventions

In the treatment group donor livers will be subjected to 2 hours of venous systemic oxygen persufflation prior to implantation, while still being stored in ice cold preservation solution.

In the control group the standard preservation method will be applied (hypothermic storage without oxygen persufflation)

Intervention Type

Procedure/Surgery

Phase

Not Applicable

Primary outcome(s)

Serum peak value of systemic aspartate aminotransferase during the first three days after transplantation

Key secondary outcome(s))

- 1. Death
- 2. Retransplantation within 3 months after implantation
- 3. Time of stay in intensive-care-unit
- 4. Hepatic tissue perfusion one hour after revascularization
- 5. Early onset of graft dysfunction (based on Quick's value as well as the use of a refined scoring-system for initial graft function based on a multi-parameter [aspartate transaminase (AST), alanine aminotransferase (ALT), Quick and bilirubin] score according to Heise and co-workers

Completion date

30/09/2013

Eligibility

Key inclusion criteria

Patients:

- 1. Men and women beyond 18 years of age
- 2. Resident in Germany
- 3. Scheduled for first liver transplantation and graft already available
- 4. Patient is willing and able to attend regular follow up examinations
- 5. Written informed consent

Donor organs:

- 1. Donor grafts that are offered to the local transplant clinic for implantation, i.e. organ rescue offers
- 2. Donor age above 65

Participant type(s)

Patient

Healthy volunteers allowed

No

Age group

Adult

Lower age limit

18 years

Sex

All

Key exclusion criteria

- 1. Listed as high urgency (HU)
- 2. Participation in this study at an earlier time
- 3. Simultaneous participation in other clinical trial
- 4. Present alcohol or drug abuse
- 5. Positive test for human immunodeficiency virus (HIV)
- 6. Pregnant or nursing

Date of first enrolment

01/08/2011

Date of final enrolment

30/09/2013

Locations

Countries of recruitment

Germany

Study participating centre University of Duisburg-Essen Essen Germany 45122

Sponsor information

Organisation

University Hospital Duisburg-Essen (Germany)

ROR

https://ror.org/04mz5ra38

Funder(s)

Funder type

Research organisation

Funder Name

Deutsche Forschungsgemeinschaft (MI 470/14-2)

Alternative Name(s)

German Research Association, German Research Foundation, Deutsche Forschungsgemeinschaft (DFG), DFG

Funding Body Type

Government organisation

Funding Body Subtype

National government

Location

Germany

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	16/08/2019	19/08/2019	Yes	No
Protocol article	protocol	28/10/2011		Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes