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Effects of HeartWare on vWF profiles

Submission date 07/07/2016	**Recruitment status** No longer recruiting	[_] Prospectively registered [_] Protocol [_] Statistical analysis plan [X] Results [_] Individual participant data
Registration date 18/07/2016	**Overall study status** Completed	
Last Edited 09/08/2019	**Condition category** Circulatory System	

Plain English summary of protocol

Background and study aims
Heart failure is a life-threatening health condition caused by the heart not being able to pump enough blood around the body at the right pressure usually as a result of the heart muscle becoming too weak or stuff to work properly. Symptoms include feeling breathless and tired, and ankle swelling (oedema). Patients can live with heart failure for a long time, with symptoms being controlled via lifestyle changes and medications. However, in the most severe cases, a heart transplant may be the only option. However, the wait for a new heart can be a long one and implanting a device called a left ventricular assist device (LVAD) can be lifesaving and buy more time for the patient. A LVAD is an artificial heart pump that supports the left ventricle of the heart (the chamber that pumps blood out the heart to travel around the body) . Blood flows from this chamber to the LVAD. The device then pumps put the blood into the aorta (the large artery leading from the heart) from where is flows to the rest of the body. Although LVAD improves the life of many people with severe heart failure, it can cause bleeding to occur, particularly in the digestive system. It may also lead to the development of acquired von Willebrand disease (a bleeding disorder that stops the blood from clotting properly). Sheer stress on blood components (such as platelets, small parts of blood cells that help with blood clotting) as they are transported though the LVAD can also play a part in internal bleeding. The aim of the study was to see how new generation LVADs (HeartWare) effects on Von Willebrand factor (vWF) metabolism and activity, acquired von Willebrand syndrome, platelet function and bleeding events in patients implanted with third generation LVADs.

Who can participate?
Men with heart failure, half of which with a LVAD implant.

What does the study involve?
Researchers look at how the small blood vessels in the body are functioning (microcirculation) in each participant using a device called a laser Doppler imager. Blood samples are also taken from all participants so that the researchers can compare vWF profiles, platelet function and bleeding complications between the two groups.

What are the possible benefits and risks of participating?
The potential benefits included gaining a better understanding of the possible side effects of LVADs. There was no risk for participants.

Where is the study run from?
Erasme Hospital (Belgium)

When is the study starting and how long is it expected to run for?
March 2013 to November 2013

Who is funding the study?
Erasme Hospital (Belgium)

Who is the main contact?
Dr Fetemeh Esmaeilzadeh

Contact information

Type(s)
Scientific

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Additional identifiers

Protocol serial number
CCB: B406201317038. Registered April 8, 2013

Study information

Scientific Title
Effects of HeartWare Ventricular Assist Device on the von Willebrand Factor: Results of an academic Belgian center

Study objectives
The aim is to characterize AvWS, platelet function and bleeding events in LVAD (HeartWare) supported patients

Ethics approval required
Old ethics approval format

Ethics approval(s)
Ethical Committee of the Erasme University Hospital, 08/04/2013, ref: CCB: B406201317038

Study design
Single centre case-control study

Primary study design
Observational

Study type(s)
Other

Health condition(s) or problem(s) studied
Heart failure

Interventions
15 LVAD recipients (HeartWare®, Framingham, MA, USA) were compared to 12 HF patients, matched for age and body mass index.

This study contained 2 parts. For part 1, researchers evaluated microvascular endothelial function and nitric oxide bioavailability of the LVAD/HF patients, using the laser Doppler imager. This non-invasive technique used iontophoresis of vasoactive substances as acetylcholine or sodium nitroprusside, coupled to the hyperemic reactions, to assess endothelium-dependent and –independent vasodilation. For part 2, blood samples were taken in order to measure the vWF and coagulation factors using hemostasis analyzers.

Statistical analyses were performed using SPSS. Data are expressed as mean±SEM. All data analyses were performed in a blinded fashion in regard to the presence or absence of a LVAD. One-way analysis of variance (ANOVA) models were used in order to determine the differences in descriptive characteristics and blood measurements among the study groups. Categorical variables were summarized by frequencies and percentages, and were analyzed by using Chi-square tests. Student t tests for independent samples were used to determine differences in normally distributed data. Correlation analyses using the Pearson correlation coefficient were also performed. A p value < 0.05 was considered statistically significant.

The patients that participated in this study were followed up by their own doctors after study end.

Intervention Type
Other

Primary outcome(s)
1. vWF profile - measuring vWF antigen and vWF activity via an immuno-turbidimetric assay, using a fully automated hemostasis analyser (BCS XP system, Innovance Siemens® Healthcare, USA). HMWM-vWF were studied by Western Blot analysis (GE, Healthcare, Germany), using SDS-agarose gel electrophoresis
2. ADAMTS13 activity - assessed by a chromogenic ELISA method (Technozym, Technoclone, Austria), based on its activity on a synthetic peptide of vWF
3. Factor VIII (% activity of normal plasma) and coagulant fibrinogen (mg/dL) were determined by chronometric techniques by means of fully automated hemostasis analyzers (BCS XP system, Siemens® Healthcare, USA; Multifibren U, Siemens® Healthcare, USA; respectively). Prothrombin time (PT, % time of normal plasma), international normalized ratio (INR), activated Partial Thromboplastin Time (aPTT, sec) were also assessed by chronometric techniques
4. Platelet aggregation , tested at physiological calcium condition by the Multiplate™ analyser

(Dynabyte, Munich, Germany), using agonists of thrombin receptor activating peptide-6 (TRAP-6), arachidonic acid (ASPI), adenosine diphosphate (ADP), a collagen binding activity assay (COL), and ristocetin. Ristocetin-induced platelet aggregation was determined at concentrations of 1 mg/mL
5. Bleeding events: The major bleeding consisted on the spontaneous rupture of a hemangioma in the inferior pole of spleen 93 days after LVAD implantation. He received 2 packed cell units and 4 units of fresh frozen plasma (FFP). This event occurred 65 days prior participation to this study. The 4 minor bleeds consisted in 3 transient nose bleedings and 1 hemorrhoid bleeding.

All blood samples were transported immediately to the hematology laboratory in order to measure the blood components.

Key secondary outcome(s))
1. Incidence of minor bleeding (blood loss without transfusion): We observed 4 minor bleeding
2. Incidence of major bleeding (need for transfusion >7 days after implantation, death after a bleeding, the need for re-operation, or any transfusion of packed red blood cells 7 days after implantation): 1 major bleeding
3. Incidence of thrombosis, defined as the formation of a blood clot within one of the VAD components, or any systemic thrombo-embolic event: 1 thrombotic event

All taken from medical history, retrieved from the patients' medical records.

Completion date
29/11/2013

Eligibility

Key inclusion criteria
1. Male
2. LVAD-supported patients
3. HF patients matched for age and body mass index to LVAD-supported patients

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Adult

Sex
All

Total final enrolment
27

Key exclusion criteria
Participants not fulfilling inclusion criteria

Date of first enrolment
15/04/2013

Date of final enrolment
15/06/2013

Locations

Countries of recruitment
Belgium

Study participating centre
Department of Cardiology, Laboratory of Haemostasis
Erasme Hospital
Université Libre de Bruxelles (ULB), Belgium
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Sponsor information

Organisation
Erasme Hospital

ROR
https://ror.org/05j1gs298

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
ULB Erasme Hospital, Brussels, Belgium

Results and Publications

Individual participant data (IPD) sharing plan

IPD sharing plan summary

Stored in repository

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	01/12/2016	09/08/2019	Yes	No
Participant information sheet	Participant information sheet	13/07/2016	26/07/2016	No	Yes
Participant information sheet		11/11/2025	11/11/2025	No	Yes