The effect on blood loss of topical and intravenous tranexamic acid in cardiac surgery patients: a randomized placebo-controlled trial

Published: 20-03-2013
Last updated: 25-04-2024

Primary Objective: the objective of this study is to determine whether the application topical TA into the pericardial cavity just before sternal closure reduces the 12 hours post-operative blood loss by 25% after cardiac surgery patients on...

Ethical review	Approved WMO
Status	Recruitment stopped
Health condition type	Cardiac therapeutic procedures
Study type	Interventional

Summary

ID

NL-OMON38995

Source
ToetsingOnline

Brief title
Topical tranexamic acid in cardiac surgery patients

Condition

- Cardiac therapeutic procedures

Synonym
post-operative blood loss

Research involving
Human

Sponsors and support

Primary sponsor: Amphia Ziekenhuis

Source(s) of monetary or material Support: Amphia Ziekenhuis;wetenschapsbudget

Intervention

Keyword: antifibrinolytica, blood loss, cardiac surgery, tranexamic acid

Outcome measures

Primary outcome

The primary study parameter is 12 hours post-operative blood loss and is assessed by 12 hours post-operative chest tube production. post-operative chest tube production 12 hours after surgical procedure

Secondary outcome

The secondary study parameters which are assessed:

* total amount of blood component transfusion (operation room, until discharge intensive care unit, total)

o packed red blood cells

o fibrinogen concentrates (haemocomplettan® CSL Behring)

o fresh frozen plasma (Octoplas®)

o Platelet concentrate

o Factor II, VII, IX en X concentrates (Cofact®)

o Transfusion exposure (=total amount of transfusion of packed red blood cells, fresh frozen plasma, platelet concentrate, cofact, fibrinogen) expressed in IU throughout Hospital stay)

o Transfusion free patients (Number of patients with)

* Routine coagulation tests (one day before surgery, post-operative at arrival at ICU and one day after surgery)

o INR

o aPTT

o number of platelets

o fibrinogen level

o Hct/ Hb

o Nadir Hb, Hct during postoperative intensive care & hospital stay

o Nadir Fibronogen during postoperative intensive care & hospital stay

* Trombo-embolische events

* Chirurgische re-explorations

Study description

Background summary

Antifibrinolytic drugs are used to reduce blood loss and exposure to transfusion in patients undergoing cardiac surgery. Tranexamic acid is indicated for blood conservation, to reduce total blood loss and decrease the number of patients who require blood transfusion during cardiac surgery procedures (class 1A evidence: recommendation that procedure or treatment is useful/effective, sufficient evidence from multiple randomized trials or meta-analyses). In our department (Amphia Hospital, Breda, the Netherlands), during cardiac surgery 2 gr TA are administrated intravenously after induction of anesthesia and 2 gr TA post cardiopulmonary bypass.
Patients with an increased incidence of thromboembolic events have an increased risc of side effects by administration of topical TA. Patients with increased or decreased bleeding tedency (see exclusion criteria), will not be included
In addition to systemic TA, a number of randomized studies have shown that topical application of TA resulted in reduction in blood loss and blood component transfusion. However, only one randomized controlled trial combined intravenous TA with topical TA. Spegar et al. showed no difference in post-operative blood loss, although, their patients required less fresh frozen plasma, concluding that larger studies are needed.
The study by Bonis et al have shown that there is no systemic absortion of tranexamic acid by topical administration.
The aim of this study is to determine whether the application of TA reduces the12 hours post-operative blood loss by 25% after cardiac surgery on cardiopulmonary bypass, whereby intravenous TA is administrated.

Study objective

Primary Objective: the objective of this study is to determine whether the application topical TA into the pericardial cavity just before sternal closure reduces the 12 hours post-operative blood loss by 25% after cardiac surgery patients on cardiopulmonary bypass, whereby intravenous TA is administrated.

Secondary Objective(s): in addition, this study is designed to compare the amount of blood component transfusion (packed red blood cells, platelet concentrate, Octoplas®, haemocomplettan®, cofact®), routine coagulation tests variables (INR, aPTT, number of platelets, fibrinogen level, Hb/Ht) between the three groups.
Furthermore the risk of thrombo-embolic events will be monitored between the topical administration of TA with placebo. In addition, the secondary objective of this study is to determine whether pericardial lavage with NaCl gives an improvement in haemostasis, compared with no pericardial lavage, resulting in a reduction of surgical re-explorations en post-operative 12-hour blood loss.

Study design

Design of the study is a randomized placebo-controlled trial. According to the anaesthetic protocol, 2 gr of intravenous TA is given pre- and post cardiopulmonary bypass in cardiac surgery patients. The dose range of topical TA that has been administrated in earlier studies, is between 1 and 2.5 gr diluted in 100 to 250 ml of saline. By means of a computer-generator 1:1:1 randomization table, one group receives pericardial lavage with 2 gr TA in 200 ml normothermic saline solution (NaCl 0.9%), the second group receives pericardial lavage with 200 ml normothermic saline solution without TA and the third group (control group) receives no pericardial lavage. The study solution is for 1 minute administrated into the pericardial cavity and spread over mediastinal tissues, to which it is then removed by the waste sucker.

Intervention

By means of randomisation, subjects are divided into three groups:one group receives pericardial lavage with 2 gr TA in 200 ml normothermic saline solution (NaCl 0.9%), the second group receives pericardial lavage with 200 ml normothermic saline solution without TA and the third group (control group) receives no pericardial lavage. Study solution is topically applied after surgical hemostasis, and just before closure metallic sternal suturing. The study solution is for 1 minute administrated into the pericardial cavity and spread over mediastinal tissues, to which it is then removed by the waste sucker. The mediastinal and pleural tubes are suctioned at -15 cmH2O.

Study burden and risks

The burden and risks associated with participation on the study are none.
Patients with an increased incidence of thromboembolic events have an increased risc of side effects by administration of topical TA. Patients with increased or decreased bleeding tedency (see exclusion criteria), will not be included.
The study by Bonis et al have shown that there is no systemic absortion of tranexamic acid by topical administration.
The number of blood samples, the number of site visits and other examinations are equal in all groups. No additional tests will be performed as in standard care.

Contacts

Public
Amphia Ziekenhuis

Locatie molengracht 21
Breda 4818 CK
NL
Scientific
Amphia Ziekenhuis

Locatie molengracht 21
Breda 4818 CK
NL

Trial sites

Listed location countries

Netherlands

Eligibility criteria

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

Inclusion criteria

* Gender; male/ female

* Age: * 18 year
* Elective cardiac surgical patients
o Coronary artery bypass graft (CABG) (conventional, E.CCO)
o Aortic valve replacement (AVR) (conventional)
o Mitral valve replacement/ Mitral valve repair (MVR/MPL) (conventional)
o Tricuspid valve replacement/ Tricuspid valve repair (TVR/ TPL)
o Bentall
o Combined procedure (e.g. CABG/ AVR, MVR/AVR, AVR/MAZE)

Exclusion criteria

* MVR/ MPL (minimal invasive)
* Maze (minimal invasive)
* AVR (minimal invasive)
* off-pump procedures
* Acute patients
* patient with increased or decreased bleeding tedency (FV leiden, prot C, S deficiency, anti-thrombin deficiency, prothrombinmutation)

Study design

Design

Study phase:	4
Study type:	Interventional
Intervention model:	Parallel
Allocation:	Randomized controlled trial
Masking:	Single blinded (masking used)
Control:	Placebo
Primary purpose:	Treatment

Recruitment

NL

Recruitment status:	Recruitment stopped
Start date (anticipated):	12-11-2013
Enrollment:	750
Type:	Actual

Medical products/devices used

Product type:	Medicine
Brand name:	cyklokapron
Generic name:	tranexamic acid
Registration:	Yes - NL intended use

Ethics review

Approved WMO Date:	20-03-2013
Application type:	First submission
Review commission:	METC Maxima Medisch Centrum (Veldhoven)
Approved WMO Date:	24-04-2013
Application type:	First submission
Review commission:	METC Maxima Medisch Centrum (Veldhoven)

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
EudraCT	EUCTR2013-000774-30-NL
CCMO	NL43697.015.13