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The influence of the continuous administration of a stimulants (ephedrine or phenylephrine) into a vein on the stability of the blood flow through the heart and blood vessels after the local anesthetic is injected around the spinal cord in the senior adults

Submission date	**Recruitment status**	[_] Prospectively registered
15/06/2017	No longer recruiting	[_] Protocol
Registration date	**Overall study status**	[_] Statistical analysis plan
20/09/2017	Completed	[X] Results
Last Edited	**Condition category**	[_] Individual participant data
15/11/2019	Surgery	

Plain English summary of protocol

Background and study aims.
Spinal (subarachnoidal) anaesthesia is a an alternative to general anesthesia (being put to sleep for surgery), which involves an injection of a local anaesthetic (numbing agent) into a space in the spine to numb the lower part of the body. Although this technique is very effective, it can lead to a drop in blood pressure and cardiac output (the amount of blood the heart pumps in one minute). Vasopressors are group of drugs that are given to patients to raise blood pressure. The most commonly used vasopressors are ephedrine and phenylephrine. When vasopressors are given, fluids (such as ringer solution) are often given at the same time to increase the amount of circulating blood in the body. Currently, there are no studies showing whether continuously delivering ephedrine and phenylephrine through a drip is an effective way of preventing decrease in blood pressure and cardiac output after spinal anesthesia in adults or elderly patients. The aim of this study is to investigate the effects of ringer solution combined with continuous infusion of vasopressors (ephedrine or phenylephrine) blood pressure and cardiac output in surgical patients.

Who can participate?
Adult patients aged 50 years and over undergoing leg surgery.

What does the study involve?
Patients are randomly allocated into three groups. All participants receive spinal anaesthesia, which involves injection of a local anaesthetic into the subarachnoid space (space in the spine), an receive 100ml ringer solution over 30 minutes through a drip to help regulate their bodily processes. Those in the first group receive an infusion of saline (salt water) through a drip at the same time as receiving the Ringer solution. Those in the second group receive an infusion of

ephedrine through a drip. Those in the third group receive a an infusion of phenylephrine through a drip. Heart rate and blood pressure are measured using a specialised device 5 minutes before and 30 minutes after the spinal anaesthesia is given in all groups.

What are the possible benefits and risks of participating?
Patients in all groups benefit from being closely monitored with advanced circulation monitoring system. There are no notable risks involved with participating.

Where is the study run from?
University Medical Centre Maribor (Slovenia)

When is study starting and how long is it expected to run for?
July 2017 to January 2018

Who is funding the study?
University Medical Centre Maribor (Slovenia)

Who is the main contact?
Dr Miodrag Žunić

Contact information

Type(s)
Scientific

Contact name
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Additional identifiers

Protocol serial number
National Medical Ethics Committee of Slovenia number: 0120-8/2017-3, KME 21/01/17-bis

Study information

Scientific Title
The influence of the infusion of ephedrine and phenilephrine on the stability of the circulation after subarachnoidal anesthesia in senior adults

Study objectives

1. The blood pressure and the cardiac output in the elderly patients, older than 50 years, who are going to have lower extremity surgery after subarachnoidal anesthesia, is more stable if they have continuous infusion of ephedrine or phenilephrine in addition to Ringer lactate infusion in comparison with the group treating only with Ringer lactate infusion
2. Ephedrine will increase cardiac output and systemic vascular resistance, while phenilephrine will predominately increase systemic vascular resistance

Ethics approval required
Old ethics approval format

Ethics approval(s)
National Medical Ethics Committee, 26/01/2017, ref: 0120-8/2017-3, KME 21/01/17-bis

Study design
Single-centre double-blind prospective randomised controlled trial

Primary study design
Interventional

Study type(s)
Treatment

Health condition(s) or problem(s) studied
Subarachnoidal anesthesia

Interventions
In the operating theatre, participants are randomised to one of three groups using closed envelope randomisation.

Group 1: Participants receive 1000 ml of Ringer solution infusion in 30 minutes after subarachnoidal anesthesia. At the same time a 30 ml infusion of 0,9% NaCl via continued infusion over 30 minutes is started.

Group 2: Participants receive 1000 ml of Ringer solution infusion in 30 minutes after subarachnoidal anesthesia. At the same time a 30 ml infusion of 0,9% NaCl with 250 mcg of phenylephrine via continued infusion over 30 minutes is started.

Group 3: Participants receive 1000 ml of Ringer solution infusion in 30 minutes after subarachnoidal anesthesia. At the same time a 30 ml infusion of 0,9% NaCl with 20mg of ephedrine via continued infusion over 30 minutes is started.

Participants in all groups undergo rescue measurements in case of haemodynamic instability:
1. Hypotension (decrease of systolic aortic pressure of more than 30% of the basic measurements before subarachnoidal anesthesia, or if the value of the systolic aortic pressure is less than 90 mmHg): additional ephedrine boluses of 5 mg repeated every three minutes with additional infusion of Ringer solution.
2. Bradycardia (<55 beats per minute): bolus of atropine 0,5 mg, repeated every one minute until heart rate frequency is more than 55 beats per minute or overall amount of 2 mg atropine is reached.

Participants have their blood pressure taken every 5 minutes, their cardiac output and heart rate frequency measured using thoracic electrical bioimpedancy using a AESCULON, OSYPCA MEDICAL, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia.

Intervention Type
Procedure/Surgery

Primary outcome(s)
1. Blood pressure is measured using oscylometric measurement with an Aesculon, Osypca Medical, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia
2. Cardiac output is measured using thoracic electrical bioimpedancy using an Aesculon, Osypca Medical, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia
3. Heart rate frequency is measured using thoracic electrical bioimpedancy using an Aesculon, Osypca Medical, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia

Key secondary outcome(s))
1. Systemic Vascular Resistance (SSVR) is measured using thoracic electrical bioimpedancy using an Aesculon, Osypca Medical, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia
2. Left Cardiac work (LCSW) is measured using thoracic electrical bioimpedancy using an Aesculon, Osypca Medical, 2011 monitor at baseline for 15 minutes before and 30 minutes after subarachnoidal anaesthesia
3. Potential rescue management is recorded for each patient by the investigator at the anesthetic documentation after subarachnoidal anaesthesia

Completion date
31/12/2017

Eligibility

Key inclusion criteria
1. Aged 50 years and over
2. ASA II-III
3. Patients scheduled for lower extremity surgery

Participant type(s)
Patient

Healthy volunteers allowed
No

Age group
Mixed

Sex

All

Total final enrolment
70

Key exclusion criteria
1. Heart failure (known ejection fraction less than 30%)
2. Manifest heart valve disease
3. Arrythmias
4. Ishaemic heart disease
5. Manifest liver disease
6. Kidney disease (serum creatinine more than 120 mmol/L)
7. BMI more than 30
8. Drug abuse (including alcohol)
9. Chronic use of benzodiazepines, opioids or other psychotropic substances
6. Drug abuse (including alcohol)
7. Chronic use of benzodiazepines, opioids or other psychotropic substances

Date of first enrolment
01/07/2017

Date of final enrolment
01/12/2017

Locations

Countries of recruitment
Slovenia

Study participating centre
University Medical Centre Maribor
Ljubljanska ulica 5
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Sponsor information

Organisation
University Medical Centre Maribor

ROR
https://ror.org/02rjj7s91

Funder(s)

Funder type
Hospital/treatment centre

Funder Name
University Medical Centre Maribor

Results and Publications

Individual participant data (IPD) sharing plan
The datasets generated during and/or analysed during the current study are/will be available upon request from Dr Miodrag Žunić.

IPD sharing plan summary
Available on request

Study outputs

Output type	Details	Date created	Date added	Peer reviewed?	Patient-facing?
Results article	results	11/11/2019	15/11/2019	Yes	No
Participant information sheet	Participant information sheet	11/11/2025	11/11/2025	No	Yes