Press release

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Basic information

Name: Junjing Su Email: junjing.su@biomed.au.dk Phone: +45 2992 3876

Department of: Biomedicine

Main supervisor: Ulf Simonsen

Title of dissertation: Wave intensity analysis in the pulmonary artery: in patients with pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension

Date for defence: 19/12/2017 at (time of day): 14:00 Place: The Blue Auditorium, Viktor Albeck Building, Vennelyst Boulevard 4, 8000 Aarhus C

Press release (Danish)

Pulsbølgeanalyse i lungepulsåren hos patienter med forhøjet blodtrykket i lungekredsløbet

"Pulsbølgeanalyse i lungepulsåren hos patienter med forhøjet blodtrykket i lungekredsløbet" er et nyt Ph.d.-projekt udført på Institut for Biomedicin, Aarhus Universitet, i samarbejde med National Heart and Lung Institute, Imperial College London. Projektet er udført af Junjing Su, der forsvarer sin afhandling d. 19/12.

Pulmonal hypertension er en alvorlig sygdom karakteriseret ved forhøjet blodtryk i lungekredsløbet førende til højresidigt hjertesvigt. På trods af avanceret behandling er dødeligheden blandt disse patienter fortsat høj. Ved at anvende en teknik der hedder bølgeintensitetsanalyse kan man undersøge det komplekse forhold mellem hjertet og lungekredsløbet samt samspillet mellem blodtrykket og blodgennemstrømningen.

Energitransport i kredsløbet kan betragtes som bølger. Hver gang hjertet slår et slag, udsendes der pulsbølger. Hvis pulskbølgen støder på en forhindring vil noget af dens energi reflekteres tilbage mod hjertet. Vi har vist at hos raske personer er de store centrale lungekar og de små perifere kar velkoblet, således at der ingen hindring er for blodgennemstrømningen. Hos patienter med pulmonal hypertension er karstivheden og karmodstanden øget. Der opstår et misfold mellem de store centralel kar og de små perifere kar på grund re-modellering i karvæggen. Dette resulterer i bølgerefleksionen, hvilker hæmmer blodgennemstrømningen i lungekredsløbet og samtidig øger blodtrykket.

Gennem dette projekt har vi fået en bedre forståelse af den bagvedliggende sygdomsmekanisme ved pulmonal hypertension, som kan fremme udviklingen af mere målrettet behandling.

Forsvaret af Ph.d.-projektet er offentligt of finder sted d. 19/12 kl. 14:00 i Det Blå Auditorium, Viktor Albeck Bygningen, Aarhus Universitet, Vennelyst Boulevard 4, 8000 Aarhus C. Titlen på projektet er "Wave intensity analysis in the pulmonary artery: in patients with pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension". Yderligere oplysninger: Ph.d.-studerende Junjing Su, email: junjing.su@biomed.au.dk, tlf.: +45 2992 3876.

Bedømmelsesudvalg:

Ida Elisabeth Holm, Klinisk lektor
Institut for Klinisk Medicin, Aarhus Universitet

Berend E. Westerhof, Seniorforsker
Academic Medical Center, University of Amsterdam

Tine Willum Hansen, Seniorforsker
Steno Diabetes Center, Gentofte

Press release (English)

Wave intensity analysis in the pulmonary artery in patients with pulmonary hypertension

"Wave intensity analysis in the pulmonary artery in patients with pulmonary hypertension" is a PhD project conducted at the Deparment of Biomedicine, Aarhus University, in collaboration with National Heart and Lung Institute, Imperial College London. The project was carried out by Junjing Su, who is defending her dissertation on 19/12.

Pulmonary hypertension is a serious condition that is characterised by raised blood pressure within the blood vessels that supply the lungs. It leads to failure of the right side of the heart and the mortality rate remains high. Using a method called wave intensity analysis we are able to perform a comprehensive assessment of the complex interaction between the heart and lung circulation and the dynamics of pulmonary blood pressure and flow.

Energy transmission in the blood circulation can be regarded as waves. When the heart beats, a pulse wave is generated. If the pulse wave encounters an obstruction, some of its energy will be reflected back towards the heart. We have shown that in healthy individuals, the large central pulmonary vessels and the small peripheral vessels are well-coupled, which facilitates the transport of energy. Patients with pulmonary hypertension have stiffer vessels and there is an increased resistance to blood flow. In addition, due to vascular remodelling, the coupling between the large vessels and the peripheral vessels is impaired, leading to wave reflection, which impedes blood flow and augments blood pressure. This impairment occurs rather early in the course of disease.

This project has provide novel insights into the disease mechanism behind pulmonary hypertension, which will facilitate the development of more targeted treatment.

The defence is public and takes place on 19/12 at 14:00 in The Blue Auditorium, Viktor Albeck Building, Aarhus University, Vennelyst Boulevard 4, 8000 Aarhus C. The title of the project is "Wave intensity analysis in the pulmonary artery: in patients with pulmonary arterial hypertension and chronic thromboembolic pulmonary hypertension". For more information, please contact PhD student Junjing Su, Email: junjing.su@biomed.au.dk, Tel: +45 2992 3876.

Assessment committee:
Ida Elisabeth Holm, Clinical Lecturer
Department of Clinical Medicine, Aarhus University

Berend E. Westerhof, Senior Researcher
Academic Medical Center, University of Amsterdam

Tine Willum Hansen, Senior Researcher
Steno Diabetes Center, Gentofte

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