



## P74 Validation of Surface Distance Measurement by MRI for Pulse Wave Velocity in Children

Adrienn Bárczi<sup>1\*</sup>, Arianna Dégi<sup>1</sup>, Orsolya Cseprekál<sup>2</sup>, Eva Kis<sup>3</sup>, Ádám Szabó<sup>4</sup>, Gábor Rudas<sup>4</sup>, George S Reusz<sup>1</sup>

<sup>1</sup>1st Department of Pediatrics, Semmelweis University, Budapest, Hungary

<sup>2</sup>Department of Transplantation and Surgery, Semmelweis University, Budapest, Hungary

<sup>3</sup>Gottsegen György Hungarian Institute of Cardiology, Budapest, Hungary

<sup>4</sup>Semmelweis University, MR Research Center, Budapest, Hungary

### ABSTRACT

**Background:** Aortic pulse wave velocity (PWV) is the gold standard measurement for arterial stiffness. Normative values exist for PWV in children using the subtracted method (LSM) for the estimation of the distance, however no imaging validation studies in the growing pediatric population. The formula of  $0.8 \times$  surface distance (L0.8) based on MRI validation is only used in adults. Our aim was to compare the different techniques of surface measurement and distances determined by MRI in pediatric subjects.

**Methods:** 21 patients were included (3.2–17.8 years) in the study. Pulse wave travel distance was assessed by surface tape measurements. Carotid-femoral path length was also measured by MRI. To calculate the reference distance (LREF) for the real aortic path length, centerpoints were placed manually in each slice and a centerline was reconstructed. Bland-Altman plots (BA) were used to assess the difference between the distances measured on surface or intraarterial.

**Results:** There was a high correlation ( $r > 0.86$ ,  $p < 0.001$ ) between surface and MRI distance measurements. According to L0.8 and LREF values the average difference was 35.9 cm and BA plots showed significant difference. The difference between LSM and LREF was 2 cm and in the BA analysis LSM and LREF were in good accordance. There was a proportional error in the BA plots in patients over 13 years.

**Conclusion:** In our study group the path length assessed by the subtracted method showed excellent correlation with intra-arterial MRI measurements. The small number of cases does not allow to conclude the difference in postpubertal patients, which needs further evaluation.

### REFERENCE

The study was supported by the National Scientific Research Grants, OTKA K124549

© 2019 Association for Research into Arterial Structure and Physiology. Publishing services by Atlantis Press International B.V.  
This is an open access article distributed under the CC BY-NC 4.0 license (<http://creativecommons.org/licenses/by-nc/4.0/>).