3.5: HEART RATE DEPENDENCE OF REGIONAL AND LOCAL AORTIC PULSE WAVE VELOCITY IN RATS AS A FUNCTION OF BLOOD PRESSURE

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On multivariate regression analysis, gothic arch was indeed associated with aorta but with no aortic root dilation (p = 0.02).

**Conclusion:** The presence of aortic coarctation and stenosis may influence the amount of dilation and the overall arch architecture in BAV patients. Patients with BAV present profoundly different morphological phenotypes depending on the presence/absence of aortic coarctation (Fig. 1).

**References**

3.4 RESERVOIR PRESSURE SEPARATION AT BRACHIAL, CAROTID AND RADIAL ARTERIES: A QUANTITATIVE COMPARISON AND EVALUATION

**Methods:** 95 participants in the Anglo-Scandinavian Cardiac Outcome Trial (ASCOT) had sequential measurements of pressure and flow velocity waveforms from carotid, brachial and radial arteries [1]. Pre-processing was performed to impose identical diastolic and mean blood pressures at all three arterial locations. Using pressure information only, reservoir pressure separation was performed [2, 3]. Systolic durations were estimated based on minimum pressure waveform derivatives.

Reservoir curves characterized by physiologically implausible parameters, i.e. a rate constant b < 0 for an asymptotic pressure p = 0, were discarded, leaving 74 subjects with valid reservoir pressure waveforms at all three arterial locations.

**Results:** Estimated reservoir parameters are shown in Table 1. We observed significant differences between arteries in almost all parameters. A high correlation was observed between reservoir pressure and reservoir pressure area at all locations, and the correlation between brachial and radial arteries was stronger for all parameter.

<table>
<thead>
<tr>
<th>Reservoir</th>
<th>Brachial Artery(B)</th>
<th>Carotid Artery(C)</th>
<th>Radial Artery(R)</th>
<th>r(B,C)</th>
<th>r(B,R)</th>
<th>r(C,R)</th>
</tr>
</thead>
<tbody>
<tr>
<td>PP [mmHg]</td>
<td>37.1 ± 8.6</td>
<td>41.6 ± 9.0</td>
<td>36.1 ± 8.4</td>
<td>0.84*</td>
<td>0.95*</td>
<td>0.84*</td>
</tr>
<tr>
<td>A0 [mmHg] s</td>
<td>16.7 ± 5.0</td>
<td>19.0 ± 4.4</td>
<td>16.0 ± 4.3</td>
<td>0.91*</td>
<td>0.96*</td>
<td>0.91*</td>
</tr>
<tr>
<td>P0 [mmHg]</td>
<td>61.6 ± 14.2</td>
<td>66.6 ± 12.8</td>
<td>66.2 ± 11.2</td>
<td>0.50*</td>
<td>0.51*</td>
<td>0.46*</td>
</tr>
<tr>
<td>A [1/s]</td>
<td>8.3 ± 3.7</td>
<td>11.4 ± 2.7</td>
<td>7.0 ± 2.7</td>
<td>0.31*</td>
<td>0.91*</td>
<td>0.18*</td>
</tr>
<tr>
<td>B [1/s]</td>
<td>1.8 ± 0.6</td>
<td>2.2 ± 0.9</td>
<td>2.1 ± 0.7</td>
<td>0.30*</td>
<td>0.62*</td>
<td>0.40*</td>
</tr>
</tbody>
</table>

**Conclusions:** The results of this study indicate differences in parameters derived from reservoir pressure separation at different arterial locations. This suggests that interpretations cannot be made agnostic to the location of measurement.

**References**

3.6 NON-INVASIVE, MRI-BASED ESTIMATION OF PATIENT-SPECIFIC AORTIC BLOOD PRESSURE USING ONE-DIMENSIONAL BLOOD FLOW MODELLING

**References**
1. Mariscal Harana J. 1, Arna van Engelen 1, Torben Schneider 2, Mateusz Florkow 1,2, Peter Charlton 1, Bram Ruijsink 1, Hubrecht De Blieck 3, Israel Valverde 1, Marietta Carakida 1, Kuberan Pushparajah 1,

**Table 1** Quantification of reservoir pressures at three arterial locations in the format of mean ± standard deviation based on 74 subjects whereby PP denotes the reservoir pulse pressure, A0 the area of reservoir pressure above diastolic blood pressure, P0 the asymptotic blood pressure and a, b = 1/τ the rate constants with the time constant τ describing the diastolic pressure decay. The correlation coefficient r is computed between relevant arterial locations. The statistical significance of the differences between locations was based on a paired t-test with * indicating p < 0.05.