RELATIVE ASSOCIATIONS OF AGE, HEIGHT AND WEIGHT ON SINUS OF VALSALVA AND MID ASCENDING AORTA: AN IMAGING AND EPIDEMIOLOGY STUDY
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BACKGROUND
- Prior studies show ascending aorta diameter varies with age, height and weight.
- Studies have not evaluated relative influence of these variables on aortic diameter.
- Furthermore, there are 2 points of interest when evaluating aortic diameter measurement.
  - Sinus of Valsalva
  - Mid ascending Aorta.
- Genetic disorders like Marfan syndrome are predominantly associated with sinus of Valsalva (SOV) dilation.
- Based on anecdotal observation, age, weight and body mass index (BMI) have been seen to correlate more with mid ascending aorta (MAA) diameter.

OBJECTIVE
- We hypothesized that height may have stronger association with SOV diameter, since it is genetically determined.
- We also sought to determine the association of acquired factors such as BMI, weight and age to the aortic diameter.

METHODS
- We evaluated echocardiographic studies of patients aged 15 years or more, performed in the last 4 years to measure SOV and MAA diameter in normal patients.
- Normal patients were classified as patient in whom the medical record and echocardiogram did not reveal any of the 28 aortic dilation risk factors defined in American Heart Association 2010 guidelines.

RESULTS
- Of 65,843 patients, 3,201 were identified as normal.
- SOV measurements were available in 2,046, MAA in 2,334.
- Age had stronger correlation with MAA ($\beta=0.50; r=0.52; p<0.001$) than SOV ($\beta=0.33; r=0.35; p<0.001$).
- Weight was similarly correlated with diameters of SOV ($r=0.37; p<0.001$) and MAA ($r=0.37; p<0.001$).
- Height had stronger correlation with SOV diameter ($\beta=0.41; r=0.38; p<0.001$) than MAA ($\beta=0.26; r=0.25; p<0.001$).

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<thead>
<tr>
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<th>Sinus of Valsalva</th>
<th>Mid Ascending Aorta</th>
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<tbody>
<tr>
<td></td>
<td>Standard Beta R</td>
<td>Standard Beta R</td>
</tr>
<tr>
<td>Height (cm)</td>
<td>0.41</td>
<td>0.38</td>
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<tr>
<td>Weight (kg)</td>
<td>0.34</td>
<td>0.37</td>
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<tr>
<td>BSA (m²)</td>
<td>0.40</td>
<td>0.41</td>
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<tr>
<td>BMI (kg/m²)</td>
<td>0.17</td>
<td>0.22</td>
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<tr>
<td>Age (years)</td>
<td>0.33</td>
<td>0.35</td>
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p<0.001 for all values; BSA = body surface area

CONCLUSIONS
- These data suggest that in normal subjects, age, weight and BMI have stronger associations with MAA and height has stronger association with SOV.