Letter to the Editor

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Interstudy Variability in the Ambulatory Arterial Stiffness Index

To the Editor:

In 2006, Li et al1 proposed the ambulatory arterial stiffness index (AASI) as a novel marker for arterial stiffness. AASI is derived from the linear relationship between systolic blood pressure and diastolic blood pressure observed using 24-hour ambulatory blood pressure monitoring.

The literature published on this topic shows some large differences in the mean AASI between studies. In our opinion, these differences cannot be fully accounted for by differences in methodology and patient characteristics. The Table shows a review of important issues of methodology and determinants of AASI from 4 original articles. In summary, an increase of AASI was relatively consistently found in women, in subjects with higher age, lower body height, increasing pulse pressure, hypertension, diabetes, and past cardiovascular disease.

Close observation of the studies by Dolan et al2 and Hansen et al3 reveals a mean AASI of 0.15 U higher in the Danish cohort compared with the Irish cohort from Dolan et al. Looking at the baseline characteristics of these 2 studies, we find several factors that would rather suggest a comparatively lower mean AASI in the Danish study population (relatively fewer women, lower pulse pressure, less hypertensive subjects, and subjects with diabetes). With regard to study design, we noticed no noteworthy differences except for the ratio of night:day blood pressure readings.

Schillaci et al4 showed in the May 2007 issue that a nocturnal nondipping pattern tended to significantly flatten the slope of diastolic blood pressure on systolic blood pressure, thereby reducing arterial compliance. The mean AASI in this Italian cohort was as low as 0.31. We hypothesized that the unusual high percentage of nondipping pattern may have added to this low value. In a preliminary analysis of our study data (1325 hypertensive subjects referred to our center for ambulatory blood pressure monitoring), we found the ratio of night:day blood pressure readings to significantly influence AASI, with relatively more readings at night tending to decrease AASI ($r = -0.10; P = 0.001$). Thus, nighttime dipping and ambulatory blood pressure monitoring protocols are probably 2 factors contributing to the discrepancies between the mean AASI in the reviewed articles.

In conclusion, important differences in mean AASI are present in the reviewed literature. Future research is necessary to identify possible confounders and, resting on our and future findings, standardization has to be established for AASI determination to draw unequivocal conclusions.

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Disclosures

None.

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Important Determinants of AASI in 4 Articles Published on AASI Along With Our Unpublished Study Data

<table>
<thead>
<tr>
<th>Previous Studies on AASI</th>
<th>Mean AASI, U</th>
<th>Measurements Per Hour With Ambulatory Blood Pressure Monitoring Device</th>
<th>Age, y</th>
<th>Women, %</th>
<th>Hypertension, %</th>
<th>Mean 24 h PP, mm Hg</th>
</tr>
</thead>
<tbody>
<tr>
<td>Li et al1 (n=348)</td>
<td>0.36</td>
<td>8 AM to 10 PM; 3; 10 PM to 8 AM: 1.3</td>
<td>46.1</td>
<td>55</td>
<td>32</td>
<td>44.7</td>
</tr>
<tr>
<td>Dolan et al2 (n=11291)</td>
<td>0.41</td>
<td>All day: 2</td>
<td>54.6</td>
<td>52</td>
<td>75.6</td>
<td>56.5</td>
</tr>
<tr>
<td>Hansen et al3 (n=1829)</td>
<td>0.56</td>
<td>7 AM to 11 PM: 4; 11 PM to 7 AM: 2</td>
<td>55.5</td>
<td>46.9</td>
<td>43.5</td>
<td>52.3</td>
</tr>
<tr>
<td>Schillaci et al4 (n=515)</td>
<td>0.31</td>
<td>All day: 4</td>
<td>48</td>
<td>44</td>
<td>100</td>
<td>48</td>
</tr>
<tr>
<td>Dechering et al,</td>
<td>0.48</td>
<td>7 AM to 11 PM: 4; 11 PM to 7 AM: 2</td>
<td>47.7</td>
<td>53.4</td>
<td>95.2</td>
<td>55.7</td>
</tr>
</tbody>
</table>

Unpublished Study Data

PP indicates pulse pressure.

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