Fat distribution and blood pressure: a twin study

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Recent research has emphasized the importance of central abdominal fat as a predictor of cardiovascular disease. Furthermore, systolic (SBP) and diastolic (DBP) blood pressure may be differently associated with fat distribution (1).

This cross-sectional study was undertaken to explore the relationship between body composition and blood pressure in a sample of 22 males, 48 females (44 monozygous (MZ), 17 dizygous (DZ) twins and 9 family members who had participated in a dietary study. The mean age was 45.8 (8.9)(SD) yrs, BMI: 25.2 (4.0) kg/m² and only those not taking anti-hypertensive therapy were included.

Blood pressure measurements, using a mercury sphygmomanometer, were taken 4 times after 5 minutes seated. Body composition was determined by a Lunar DPX-L X-ray densitometer. The relationship of body composition to blood pressure (BP) (age-adjusted) was assessed using univariate regression. In the sub-group of same sex twin pairs (22 MZ, 9 DZ pairs), the within twin pair difference in body composition was assessed in relation to the within pair difference in BP (regression through the origin).

The within twin pair difference in abdominal fat was associated with the within pair difference in DBP 0.004(0.002) (β(s.e)(P < 0.05)). The within pair difference in BMI and total fat was not associated with within pair difference in SBP or DBP.

BMI and abdominal fat were associated with both SBP and DBP crosssectionally, however within twin pairs only abdominal fat was positively associated with DBP. These associations are evident within a group of adults who are not hypertensive and agree with a recent study, which found that body fatness, especially central abdominal fat is associated with DBP in normotensive middle-aged men and women (2).

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<tr>
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<th>R²</th>
<th>β (se)</th>
<th>R²</th>
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<tbody>
<tr>
<td>BMI (kg/m²)</td>
<td>0.10**</td>
<td>0.75 (0.36)</td>
<td>0.11**</td>
<td>0.82 (0.23)</td>
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<tr>
<td>Total fat (g)</td>
<td>0.001</td>
<td>0.001 (0.000)</td>
<td>0.004*</td>
<td>0.001 (0.000)</td>
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<tr>
<td>Abdominal fat (g)</td>
<td>0.06*</td>
<td>0.004 (0.002)</td>
<td>0.06*</td>
<td>0.003 (0.001)</td>
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</tbody>
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*P < 0.05 ** P < 0.01.