Metabolic syndrome and disability: findings from the prospective three-city study.

Isabelle Carriere, Karine Pérès, Marie-Laure Ancelin, Véronique Gourlet, Claudine Berr, Pascale Barberger-Gateau, Kim Bouillon, Mika Kivimaki, Karen Ritchie, Tasnime Akbaraly

To cite this version:

HAL Id: inserm-00854455
https://www.hal.inserm.fr/inserm-00854455
Submitted on 7 Jul 2014

HAL is a multi-disciplinary open access archive for the deposit and dissemination of scientific research documents, whether they are published or not. The documents may come from teaching and research institutions in France or abroad, or from public or private research centers.

L’archive ouverte pluridisciplinaire HAL, est destinée au dépôt et à la diffusion de documents scientifiques de niveau recherche, publiés ou non, émanant des établissements d’enseignement et de recherche français ou étrangers, des laboratoires publics ou privés.
### Table A: Association between metabolic syndrome components mutually adjusted for metabolic syndrome and social restriction, mobility and IADL limitations.

<table>
<thead>
<tr>
<th></th>
<th>Social restriction N=5893</th>
<th></th>
<th>Mobility N=3497</th>
<th></th>
<th>IADL N=5764</th>
<th></th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR*</td>
<td>95%CI</td>
<td>p-value</td>
<td>OR*</td>
<td>95%CI</td>
<td>p-value</td>
</tr>
<tr>
<td>Central obesity</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for central obesity</td>
<td>1.29</td>
<td>0.93-1.77</td>
<td>0.12</td>
<td>1.43</td>
<td>1.12-1.81</td>
<td>0.004</td>
</tr>
<tr>
<td>Central obesity adj for MetS</td>
<td>1.69</td>
<td>1.21-2.34</td>
<td>0.002</td>
<td>1.19</td>
<td>0.94-1.50</td>
<td>0.15</td>
</tr>
<tr>
<td>High Triglycerides</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for high TG</td>
<td>1.44</td>
<td>1.01-2.05</td>
<td>0.05</td>
<td>1.46</td>
<td>1.13-1.90</td>
<td>0.004</td>
</tr>
<tr>
<td>High TG adj for MetS</td>
<td>1.13</td>
<td>0.80-1.60</td>
<td>0.48</td>
<td>1.06</td>
<td>0.84-1.35</td>
<td>0.61</td>
</tr>
<tr>
<td>Low HDL cholesterol</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for low HDL-chol</td>
<td>1.60</td>
<td>1.13-2.27</td>
<td>0.008</td>
<td>1.38</td>
<td>1.07-1.78</td>
<td>0.01</td>
</tr>
<tr>
<td>Low HDL chol adj for MetS</td>
<td>0.89</td>
<td>0.60-1.32</td>
<td>0.56</td>
<td>1.26</td>
<td>0.94-1.67</td>
<td>0.12</td>
</tr>
<tr>
<td>High Blood pressure</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for high BP</td>
<td>1.52</td>
<td>1.11-2.06</td>
<td>0.008</td>
<td>1.54</td>
<td>1.23-1.93</td>
<td>0.0002</td>
</tr>
<tr>
<td>High BP adj for MetS</td>
<td>1.04</td>
<td>0.76-1.43</td>
<td>0.79</td>
<td>0.91</td>
<td>0.75-1.10</td>
<td>0.34</td>
</tr>
<tr>
<td>Elevated Fasting blood glucose</td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for elevated FBG</td>
<td>1.51</td>
<td>1.06-2.14</td>
<td>0.02</td>
<td>1.39</td>
<td>1.08-1.78</td>
<td>0.01</td>
</tr>
<tr>
<td>Elevated FBG adj for MetS</td>
<td>1.02</td>
<td>0.73-1.43</td>
<td>0.89</td>
<td>1.21</td>
<td>0.97-1.51</td>
<td>0.09</td>
</tr>
</tbody>
</table>

MetS: metabolic syndrome; TG: triglycerides; BP: blood pressure; FBG: fasting blood glucose; IADL: instrumental activities of daily living;

* Odds ratio adjusted for center, baseline age, time, baseline interaction age x time, sex, education, income, living alone, alcohol, BMI, smoking, cognitive impairment, visual impairment, hearing impairment, depressive symptoms, respiratory disease, CVD, lipid lowering treatment and APOEε4 genotype.
### Appendix-Table B: Contribution of the metabolic syndrome components to the association between metabolic syndrome and social restriction, mobility/activity limitations

<table>
<thead>
<tr>
<th></th>
<th>Social restriction N=5893</th>
<th>Mobility limitations N=3497</th>
<th>IADL limitations N=5764</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>βa</td>
<td>SE</td>
<td>Reduction in effect (%)b</td>
</tr>
<tr>
<td><strong>MetS Alone</strong></td>
<td>1.0387</td>
<td>0.145</td>
<td></td>
</tr>
<tr>
<td><strong>MetS adjusted for one component</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for Central obesity.</td>
<td>0.4406</td>
<td>0.1674</td>
<td>57.58</td>
</tr>
<tr>
<td>MetS adj. for High Triglycerides</td>
<td>1.0134</td>
<td>0.1752</td>
<td>2.44</td>
</tr>
<tr>
<td>MetS adj. for low HDL cholesterol</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for Hypertension</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for Elevated FBG</td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td><strong>MetS adjusted for two components</strong></td>
<td></td>
<td></td>
<td></td>
</tr>
<tr>
<td>MetS adj. for Central obesity + Elevated FBG</td>
<td>0.2886</td>
<td>0.137</td>
<td>55.18</td>
</tr>
</tbody>
</table>

MetS: metabolic syndrome; TG: triglycerides; BP: blood pressure; FBG: fasting blood glucose; IADL: instrumental activities of daily living

β : logistic regression coefficient; SE: Standard Error

*adjusted for center, baseline age, time, baseline interaction age x time and sex

b The percent attenuation in the association was determined for component significantly associated to activity limitation incidence (see figure 1) using the formula % = {(βMetS − βMetS adjusted for component)/βMetS} ×100, where the βs are the coefficients estimated from the mixed logistic model.
Appendix-Table C: Association between Metabolic syndrome and limitations in participants free of cardiovascular diseases (prevalent or incident)

<table>
<thead>
<tr>
<th></th>
<th>Social restriction</th>
<th>Mobility limitation</th>
<th>IADL limitation</th>
<th>ADL limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N= 4442</td>
<td>N= 2767</td>
<td>N= 4367</td>
<td>N= 4585</td>
</tr>
<tr>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
</tr>
<tr>
<td>Model 1^</td>
<td>2.76 (1.89-4.03)  &lt;0.0001</td>
<td>1.74 (1.37-2.23)  &lt;0.0001</td>
<td>2.28 (1.70-3.05)  &lt;0.0001</td>
<td>1.91 (0.91-4.03)  0.09</td>
</tr>
<tr>
<td>Model 2^</td>
<td>1.47 (0.99-2.18)  0.05</td>
<td>1.37 (1.06-1.78)  0.02</td>
<td>1.54 (1.13-2.11)  0.007</td>
<td>1.01 (0.45-2.28)  0.98</td>
</tr>
</tbody>
</table>

OR: odds ratio; 95% CI: confidence interval at 95%; IADL: instrumental activities of daily living; ADL: basic activities of daily living

^Model 1: adjusted for sex, center, age, time and interaction time * age

^Model 2: Model 1+ adjustment for incomes, education level, marital status, alcohol intake, smoking status, BMI, respiratory diseases, depression, use of lipid lowering drugs, and geriatric condition including cognitive, visual, hearing impairment and APOEε4 genotype
### Appendix-Table D: Association between Metabolic syndrome and limitations after excluding incident cases of dementia

<table>
<thead>
<tr>
<th></th>
<th>Social restriction (N= 5543)</th>
<th>Mobility limitation (N= 3344)</th>
<th>IADL limitation (N= 5431)</th>
<th>ADL limitation (N= 5732)</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>OR (95%CI)</td>
<td>p-value</td>
<td>OR (95%CI)</td>
<td>p-value</td>
</tr>
<tr>
<td>Model 1&lt;sup&gt;a&lt;/sup&gt;</td>
<td>3.01 (2.22-4.10)</td>
<td>&lt;0.0001</td>
<td>1.82 (1.47-2.26)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Model 2&lt;sup&gt;b&lt;/sup&gt;</td>
<td>1.60 (1.16-2.20)</td>
<td>0.004</td>
<td>1.46 (1.16-1.83)</td>
<td>0.001</td>
</tr>
</tbody>
</table>

OR: odds ratio; 95% CI: confidence interval at 95%; IADL: instrumental activities of daily living; ADL: basic activities of daily living

<sup>a</sup> Model 1: adjusted for sex, center, age, time and interaction time * age

<sup>b</sup> Model 2: Model 1+ adjustment for incomes, education level, marital status, alcohol intake, smoking status, BMI, cardiovascular diseases, respiratory diseases, depression, use of lipid lowering drugs, and geriatric condition including cognitive, visual, hearing impairment and APOEε4 genotype
**Appendix-Table E:** Association between metabolic syndrome and limitations after excluding participants treated with anti-diabetic drugs at baseline

<table>
<thead>
<tr>
<th></th>
<th>Social restriction</th>
<th>Mobility limitation</th>
<th>IADL limitation</th>
<th>ADL limitation</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>N= 5560</td>
<td>N= 3310</td>
<td>N= 5447</td>
<td>N= 5767</td>
</tr>
<tr>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
<td>OR (95%CI) p-value</td>
</tr>
<tr>
<td>Model 1(^a)</td>
<td>2.38 (1.73-3.27)</td>
<td>&lt;0.0001</td>
<td>1.71 (1.36-2.15)</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>Model 2(^b)</td>
<td>1.37 (0.98-1.90)</td>
<td>0.06</td>
<td>1.40 (1.10-1.79)</td>
<td>0.007</td>
</tr>
</tbody>
</table>

OR: odds ratio; 95% CI: confidence interval at 95%; IADL: instrumental activities of daily living; ADL: basic activities of daily living

\(^a\) Model 1: adjusted for sex, center, age, time and interaction time * age

\(^b\) Model 2: Model 1+ adjustment for incomes, education level, marital status, alcohol intake, smoking status, BMI, cardiovascular diseases, respiratory diseases, depression, use of lipid lowering drugs, and geriatric condition including cognitive, visual, hearing impairment and APOE\(\varepsilon\)4 genotype