Sex Disparities in the Treatment and Control of Cardiovascular Risk Factors in Type 2 Diabetes

OBJECTIVE — To assess whether sex differences exist in the effective control and medication treatment intensity of cardiovascular disease (CVD) risk factors.

RESEARCH DESIGN AND METHODS — We performed a cross-sectional analysis including 44,893 patients with type 2 diabetes (51% women). End points included uncontrolled CVD risk factors (LDL cholesterol ≥130 mg/dl, systolic blood pressure [SBP] ≥140 mmHg, and A1C ≥8%) and the intensity of medical management in patients with uncontrolled CVD risk factors. Multiple-adjusted odds ratios were calculated after stratification for the presence of CVD (present in 39% of the patients).

RESULTS — Women with CVD were less likely to have SBP, LDL cholesterol, and A1C controlled and less likely to receive intensive lipid-lowering treatment. Women without CVD were less likely than men to have LDL cholesterol controlled with no differences in SBP or A1C control.

CONCLUSIONS — Women with diabetes and CVD have poorer control of important modifiable risk factors than men and receive less intensified lipid-lowering treatment.

Mortality rates from cardiovascular disease (CVD) have been declining during recent years in both men and women in the U.S. and Europe (1,2). However, in patients with diabetes, a decrease has been observed only in men (2). Furthermore, the relative risk for fatal diabetes-associated coronary heart disease is 50% higher in women than in men (3). More adverse cardiovascular risk profiles among women with diabetes have been postulated as a possible explanation, as well as potential disparities in treatment that favor men (3–5). A study from U.S. managed care health plans found poorer control of blood pressure and LDL cholesterol in female compared with male patients and suggested that these findings may contribute to the sex disparity in CVD mortality trends (6). No study in Europe has investigated sex disparities in the main cardiovascular risk factors in patients with diabetes and/or has put them into perspective with treatment intensity.

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Sex disparities in type 2 diabetes treatment

Table 1—Odds ratios (ORs) and 95% CIs between diabetic men and women for CVD risk factors not under control, as well as for intensity of medication management* for each CVD risk factor among patients with levels not under control (unadjusted and adjusted estimates using male sex as the referent)

<table>
<thead>
<tr>
<th>CVD risk factors not in control (unadjusted)</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
<th>CVD risk factors not in control (multiple adjusted)</th>
<th>OR</th>
<th>95% CI</th>
<th>P</th>
</tr>
</thead>
<tbody>
<tr>
<td>SBP ≥140 mmHg</td>
<td>1.20</td>
<td>1.12–1.27</td>
<td>&lt;0.0001</td>
<td>SBP ≥140 mmHg</td>
<td>1.08</td>
<td>1.03–1.13</td>
<td>0.003</td>
</tr>
<tr>
<td>LDL cholesterol ≥130 mg/dl</td>
<td>1.33</td>
<td>1.25–1.42</td>
<td>&lt;0.0001</td>
<td>LDL cholesterol ≥130 mg/dl</td>
<td>1.21</td>
<td>1.15–1.28</td>
<td>&lt;0.0001</td>
</tr>
<tr>
<td>A1C ≥8%</td>
<td>1.04</td>
<td>0.97–1.11</td>
<td>0.32</td>
<td>A1C ≥8%</td>
<td>1.01</td>
<td>0.95–1.07</td>
<td>0.82</td>
</tr>
</tbody>
</table>

Conclusions — In this large German population of patients with type 2 diabetes, women with a history of CVD were more likely to have all three risk factors uncontrolled, with differences in lipid control being the most pronounced. Women were also less likely to receive lipid-lowering medications. Among patients without a history of CVD, women were more likely to have uncontrolled LDL cholesterol. These results are of particular interest, since it has been shown that the stronger effect of type 2 diabetes on the risk of coronary heart disease in women is in part explained by a greater effect of atherogenic dyslipidemia and blood pressure in diabetic women. Our findings are consistent with previous reports, albeit supported by a much larger data source. A cross-sectional analysis in American patients with diabetes found that women were less likely than men to have A1C <7%, less likely to be treated with lipid-lowering medications, and, when treated, less likely to have LDL cholesterol <100 mg/dl. We extend the above data by showing that lack of control is even more pronounced among patients with CVD, a finding with obvious clinical implications.

We have recently shown that among patients with diabetes, physicians focus more on antihyperglycemic treatment, although blood pressure and lipid control are more effective in affecting patient-related end points.

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been concluded, they had full access to all of the data. Neither the sponsor nor the CRO had a role in the evaluation and interpretation of the data or in writing the manuscript.

References