Brief report

Obesity in Castile and Leon, Spain: Epidemiology and Association With Other Cardiovascular Risk Factors

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INTRODUCTION

Obesity is a serious public health problem and has a high prevalence in the developed world. It raises mortality and diminishes life-expectancy and quality of life, especially in young adults. In Castile and Leon, Spain, the 2003 Regional Health Survey found that 35.9% of the population were overweight, which is similar to the Spanish mean, and that 11.7% were obese, which is below the national mean. 5

Along with high blood pressure, diabetes mellitus, hyperlipidemia and smoking, excess weight is recognized as having contributed to the increased prevalence of ischemic vascular disease, either directly or through interactions with other risk factors. However, substantial doubt remains about the real significance of obesity in the genesis of cardiovascular disease and about the extent to which diet and lifestyle changes influence the different types of obesity, when analyzed by age, gender, or the environment in which the population lives (i.e. rural or urban).

In the present study, we investigated indicators of obesity in the population aged ≥15 years in Castile and Leon, Spain, and studied the relationship between obesity and other cardiovascular risk factors.

METHODS

Our data were obtained from the Study of Cardiovascular Risk in Castile and Leon, which was a descriptive study carried out in
collaboration with primary care professionals in 2004 in a sample of the population aged ≥15 years. The sample was stratified by healthcare area and by residence in a rural or urban–semiurban area. The study design and general results have been published elsewhere.9,10

First, a simple random sample of physicians was selected. Then, a random sample of patients registered with these physicians was selected and 450 individuals from each of 11 healthcare areas were enrolled in the study. The sample size was calculated to give \( p = 50\% \) and an error of 5% with an estimated 20% nonresponders. The final sample consisted of 4012 individuals.

We reviewed each individual’s clinical history, measured their blood pressure, weight, height, and waist circumference, and took a blood sample. Physical examinations were performed with individuals barefoot and in underclothes. Waist circumference was measured in supine decubitus by passing a tape measure around the body at the point where the abdominal circumference was measured. Blood pressure, weight, height, and waist circumference, and took a blood sample. Physical examinations were performed with individuals barefoot and in underclothes. Waist circumference was measured in supine decubitus by passing a tape measure around the body at the point

RESULTS

Prevalence of Obesity

The estimated prevalence of obesity (i.e., a BMI ≥30 kg/m²) was 21.7% (95% confidence interval [CI], 20.3%–23.2%); it was higher in women than in men, at 23.2% (95% CI, 20.9%–25.5%) and 20.4% (95% CI, 18.0%–22.7%), respectively. The prevalence was highest in individuals aged 60–64 years; rates were higher in men <50 years and in women ≥50 years. In men, the prevalence was highest at 55–59 years and in women, at 60–64 years; above the latter age range, the prevalence in women was double that in men (Table 1).

The prevalence of morbid obesity (i.e., a BMI ≥40 kg/m²) was 1.4% (1.0% in men and 1.9% in women). Morbid obesity was most prevalent at 50–54 years, when the prevalence in women was highest; the maximum prevalence in men occurred at 45–49 years.

In men, the age-adjusted rates of obesity and morbid obesity were 18.8% and 0.9%, respectively, which was significantly lower than in women, at 22.5% and 2.0%, respectively.

Obesity was more prevalent in rural areas (26.2%; 95% CI, 23.4%–28.1%) than urban–semiurban areas (18.7%; 95% CI, 16.3%–20.1%) and these differences were maintained after age-adjustment (24.6% and 18.1%, respectively).

The estimated prevalence of AO was 36.7% (95% CI, 34.6%–38.9%); it was higher in women (50.1%; 95% CI, 47.0%–53.1%) than in men (22.8%; 95% CI, 20.3%–25.2%). The prevalence was highest in women aged 60–74 years (Table 2).

As with the BMI estimate of obesity, we found that AO was more prevalent in rural areas (40.1%; 95% CI, 36.6%–43.7%) than urban–semiurban areas (34.4%; 95% CI, 31.6%–37.1%) and these differences were maintained after age-adjustment.

Relationship of Obesity to Other Cardiovascular Risk Factors

The relationships between obesity and other cardiovascular risk factors are shown in Table 3. High blood pressure was more common among obese (65.7%) and overweight individuals (45.1%) than among those with a normal BMI (21.0%) and these differences were statistically significant. Results for AO were similar. Diabetes mellitus was more frequent among obese (17.3%) than normal weight individuals (4.7%).

We found smaller differences in hypercholesterolemia for the different levels of obesity based on BMI and AO, although these differences were also statistically significant. In contrast, we found fewer smokers and more ex-smokers among obese individuals.

<table>
<thead>
<tr>
<th>Table 1</th>
<th>Estimated Prevalence of Obesity and Morbid Obesity by Age Group and Gender</th>
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<tbody>
<tr>
<td></td>
<td>Obesity (BMI ≥30 kg/m²)</td>
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<tr>
<td></td>
<td>Total (Men, Women)</td>
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<tr>
<td></td>
<td>21.7 (20.3–23.2)</td>
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<td>Age (years)</td>
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<tr>
<td>15–34</td>
<td>9.8 (7.8–11.9)</td>
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<tr>
<td>35–39</td>
<td>14.4 (10.8–18)</td>
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<tr>
<td>40–44</td>
<td>20.7 (15.7–25.7)</td>
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<tr>
<td>45–49</td>
<td>19.3 (13.3–25.2)</td>
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<td>50–54</td>
<td>26.3 (20–32.6)</td>
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<tr>
<td>55–59</td>
<td>33.9 (28.1–39.6)</td>
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<tr>
<td>60–64</td>
<td>36.9 (30.8–43)</td>
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<tr>
<td>65–69</td>
<td>26.1 (20.9–31.2)</td>
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<td>70–74</td>
<td>29.3 (22.8–35.3)</td>
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<tr>
<td>&gt;75</td>
<td>26.5 (22.3–30.8)</td>
</tr>
</tbody>
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BMI, body mass index.
Data express % and 95% CI.
We found that a history of stroke was more frequent in overweight and obese individuals, and the prevalence of myocardial infarction in these groups was double that in individuals with a normal BMI. The differences for stroke were not significant. A high 10-year risk of death from stroke (i.e. a SCORE index/C21 >5%) was more common among obese (12%) than overweight (8.0%) or normal weight (3.7%) individuals. We found similar differences for a high 10-year risk of ischemic heart disease (i.e. a Framingham index score/C21 ≥20%): 15.7% in obese, 11.9% in overweight and 3.9% in normal weight individuals. We found similar differences for AO.

DISCUSSION

The BMI and waist circumference are the most widely used parameters for determining obesity because they are easily obtained.2,14

Almost half the men and one-third of the women in our study were overweight and one in five was obese, which is compatible with the results of other national and multinational studies.15–17 The prevalence of obesity was less with the BMI measure (21.7%) than with the waist circumference measure (36.7%) and these differences were greater in women.

We found strong relationships between obesity and high blood pressure, and between obesity and diabetes mellitus. The relationship with hypercholesterolemia was much weaker. The lower number of smokers among obese individuals points to a reduction in cardiovascular risk factors in this group, and there was an inverse relationship between age and smoking.

There was no significant increase in the risk of ischemic vascular disease among obese or overweight individuals, which indicates that the risk of a cardiovascular event may be associated with a not particularly high BMI, or that individuals who had had an ischemic episode maintained a degree of control over their weight. In contrast, the prospective estimated risk (i.e. the population with a SCORE index/C21 >5% or a Framingham score/C21 ≥20%) increased significantly with overweight, obesity and AO.

The high prevalence of obesity could be related to the fact that neither the population as a whole nor healthcare professionals regard obesity as an illness. Instead, they see it as an imprecise risk factor that is more closely related with aesthetic concerns than with anthropometric measures. The perception of the level of obesity varied with how it was measured and this perception conditioned the attitude professionals and patients adopted towards the prevention of cardiovascular disease and the control of total cardiovascular risk.

CONFLICTS OF INTEREST

The authors state that they have no conflicts of interest.
REFERENCES