Mini Report

Mini-report on the association between obesity and acute myocardial infarction in Japanese

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Obesity is a marker of the clustering of metabolic risk factors for coronary heart disease (CHD) [1,2] and obesity itself is also an independent risk factor of CHD among white populations [3-6]. Obesity is not prevalent in Japan and the prevalence of CHD in Japan has been reported to be the lowest among developed countries [7,8]. The low prevalence of obesity and CHD in Japan may partly result from the low-fat vegetable- and fish-rich Japanese diet [9,10]. There have been conflicting data regarding the relationship between obesity and CHD in Japan [11-18]. Some studies have suggested a significant association between obesity and CHD in Japanese [11,13] but others have found opposite results [12,15,17,18]. A case-control study suggested that obesity is independently associated with acute myocardial infarction (AMI) in young and middle-aged men, but not in women and older men [16]. The age- and sex-related differences in the association between risk factors of CHD and abdominal obesity might contribute, at least in part, to these conflicting data in Japan [19]. So, we investigated the age- and sex-related association between obesity and AMI after controlling for diabetes, hypertension, hypercholesterolemia, and smoking in age- and sex-matched case-control samples in Japan [20].

This observational case-control study was based on the data 0f 1,199 AMI patients who were admitted to our Cardiovascular Center within 10 days from symptom onset and 4,056 apparently healthy controls. The exclusion criteria were a history of prior myocardial infarction, non-Japanese ethnicity, age ≥ 80 years and the lack of body weight and height information. Body mass index (BMI) was calculated as body weight (kg) divided by square of height (m) and obesity was defined as BMI ≥ 25 kg/m^2 [20]. Diabetes was diagnosed by pre-admission information or fasting glucose ≥7.0 mmol/L and/or hemoglobin A1c ≥ 6.5% (NGSP). Hypertension was diagnosed by pre-admission information or systolic blood pressure ≥ 140 mmHg and/or diastolic blood pressure ≥ 90 mmHg in later stable hospital days after admission. Hypercholesterolemia was diagnosed by pre-admission information or total cholesterol ≥ 5.7 mmol/L and/or LDL cholesterol ≥ 3.6 mmol/L.

The analysis was performed in age- and sex-matched samples of 621 case-control pairs and, in crude samples aged 40-79 years, were divided into 10-year age groups. Prevalence of obesity, diabetes, current smoking, hypertension, and hypercholesterolemia were compared between cases and controls and a multivariable odds ratio (OR) of AMI was calculated for each risk factor in various age groups.

The OR (95% confidence interval (CI)) of AMI for obesity was 1.63 (1.23-2.17) $p<0.001$ in men younger than 80 years and 2.65 (1.41-5.00) $p=0.003$ in women younger than 80 years, 2.23 (1.46-3.41) $p<0.001$ in men aged 59 years or younger, 1.34 (0.90-2.01) $p=0.15$ in men aged 60-79 years, 2.98 (1.56-5.71) $p=0.001$ in women aged 60-79 years using paired samples. The OR (95% CI) of AMI for obesity was 4.92 (2.53-9.58) $p<0.001$ in men aged 40-49 years, 1.54 (1.07-2.21) $p=0.02$ in men

aged 50-59 years, 1.07 (0.69-1.66) $p=0.77$ in men aged 60-69 years, 2.24 (1.20-4.20) $p=0.01$ in men aged 70-79 years, 2.48 (1.12-5.48) $p=0.02$ in women aged 60-69 years, and 3.05 (1.46-6.37) $p=0.003$ in women aged 70-79 years using crude samples.

The above results demonstrated that obesity was independently associated with AMI in men aged 59 years or younger, men aged 70-79 years, and women aged 79 years or younger but not in men aged 60-69 years. Diabetes and current smoking were strongly associated with AMI in both men and women in this Japanese population. Thus, the association between obesity and AMI was age- and gender-dependent in a Japanese population. Weight reduction should be recommended to obese individuals, especially those with metabolic syndrome. However, it should be carefully considered for elderly evaluating the risks and benefits weight reduction.

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