National Prevalence of Obesity

Prevalence of obesity and metabolic syndrome in Korean adults

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Summary

We studied the prevalence and trend of obesity and metabolic syndrome in Korean adults aged at least 20 years using Korean National Health Examination and Nutrition Survey data from 1998 and 2001. The prevalence of body mass index (BMI) ≥ 25 kg m⁻² among Korean adults in 2001 was 32.9% in men and 27.4% in women, and the number of Korean men with BMI ≥ 25 kg m⁻² has increased markedly since 1998. A significant positive association between obesity and socioeconomic status was found in Korean men, whereas a significant negative association was identified in Korean women. The prevalence rates of waist circumference (WC) ≥ 90 cm in men and WC ≥ 85 cm in women were 23.4% and 23.1% in 2001 respectively. The prevalence of metabolic syndrome among Korean adults was 15–30% according to various criteria of metabolic syndrome. Future studies are needed to determine the changes in prevalence of obesity and contributing factors for obesity in Koreans.

Keywords: Koreans, metabolic syndrome, obesity, prevalence.

Introduction

Over the past several decades, South Korea has experienced rapid socioeconomic growth, resulting in lifestyle changes that have led to marked increases in obesity and type 2 diabetes (1), as well as cardiovascular diseases. The morbidity and mortality of cardiovascular diseases have gradually increased in Korea (2), as in other Asian countries. We report the prevalence and trend of obesity and metabolic syndrome in Korean adults aged at least 20 years using the Korean National Health Examination and Nutrition Survey (KNHENES) data from 1998 (3) and 2001 (4).

Prevalence of obesity and metabolic syndrome

Study subjects and criteria for obesity and metabolic syndrome

The KNHENES is a comprehensive, nationwide and representative survey, which has been conducted periodically since 1998. Body weight and height were measured while subjects were wearing light clothing without shoes. Waist circumference (WC) was measured at the narrowest point between the lower borders of the rib cage and the iliac crest.

The prevalence rates of obesity were determined using body mass index (BMI) ≥ 30 kg m⁻² (5) and BMI ≥ 25 kg m⁻² (6) respectively. In addition, the prevalence of abdominal obesity was assessed according to the criteria suggested by the National Cholesterol Education Program Adult Treatment Panel (NCEP ATP) III (7), the International Obesity Task Force Asian-Pacific region (6) and the cut-offs for Korean adults proposed by the Korean Society for the Study of Obesity (WC ≥ 90 cm in men and WC ≥ 85 cm in women) (8). The prevalence of metabolic syndrome was estimated based on the definitions proposed by the International Diabetes Federation (IDF) (9), NCEP ATP III (7) and modified NCEP ATP III (10).
Prevalence of obesity

According to large cohorts of Korean individuals studied between 1992 and 2000, the prevalence of obesity (BMI ≥ 30 kg m⁻²) increased 2.5-fold in men and 2.3-fold in women during this period (11). Between 1998 and 2001, the prevalence rates of BMI ≥ 30 kg m⁻² and BMI ≥ 25 kg m⁻² in men increased from 1.8% and 25.5% in 1998 to 2.8% and 32.9% in 2001 respectively. However, the prevalence rates of BMI ≥ 30 kg m⁻² and BMI ≥ 25 kg m⁻² in women were 3.1% and 27.4% in 2001, which were similar to those in 1998 (Table 1).

As societies develop, men and women could have different attitudes towards bodyweight status and may have different practices for controlling body weight. In Korea, there is strong social pressure against obesity in women, whereas social attitudes are more lenient towards obese men. This could account for the observation that the prevalence of obesity increased dramatically in a 3-year period between 1998 and 2001 in men, whereas the prevalence rate in women remained stable. Over the same period, the prevalence of obesity in Korean children and adolescents doubled, increasing from 5.4% in 1998 to 11.3% in 2001 (12).

Prevalence of obesity according to socioeconomic status

There were significant differences between men and women in the association between socioeconomic status and obesity in Korean adults using 1998 data (13). Monthly household income and individual education level were used as indicators of socioeconomic status. Respondents were categorized into four classes according to their reported income: less than $1000 (Korean currency; 1 US dollar = 1000 won), $1000–$2000, $2000–$3000, or $3000 or more. Education level was defined as the highest level of individual education completed and was categorized into three groups: elementary (up to 6 years of schooling), middle or high school (7–12 years of schooling) and college or higher (at least 13 years of schooling). In both men and women, there were statistically significant dose-response relationships (P for all trends < 0.05) between obesity (BMI ≥ 25 kg m⁻²) and income or education level: the prevalence of obesity increased in men with higher income or education level, but was reduced in women with higher income or education level (Fig. 1).

The increased risk for obesity in Korean men of higher socioeconomic status may be attributed to lifestyle factors, including the tendency of these men to consume high-calorie food, frequently consume alcohol and be physically inactive during working days. By contrast, our observation that women with higher socioeconomic status have a lower risk for obesity can be attributed to attitudes of this group of women to pursue a slimmer body, and the tendency of women to control their diet and activity patterns to achieve a healthier lifestyle.

Prevalence of abdominal obesity

The prevalence of abdominal obesity may differ depending on the criteria used for abdominal obesity. The prevalence of abdominal obesity according to the criteria for US individuals (WC ≥ 102 cm in men and WC ≥ 88 cm in...
women) was 1.8% in Korean men and 15.4% in Korean women in 2001. The prevalence of abdominal obesity according to the criteria for Asians (WC ≥ 90 cm in men and WC ≥ 80 cm in women) was much higher; 23.4% in men and 40.6% in women (Table 1).

The Korean Society for the Study of Obesity defined the cut-off values of WC for abdominal obesity as WC ≥ 90 cm for men and WC ≥ 85 cm for women for Koreans adults (8) according to the IDF’s suggestion that ethnic-specific cut-off values of WC are appropriate for diagnosis of metabolic syndrome (9). Previous data have suggested similar WC cut-off points for detecting a high cardiovascular risk in Koreans (14). In Korean women, the sensitivity for predicting cardiovascular risk decreased when we applied a cut-off ≥ 88 cm of WC, while when we applied a cut-off ≥ 80 cm of WC, the specificity decreased for predicting cardiovascular risk (8). These findings indicate that WC ≥ 85 cm is a more suitable definition of abdominal obesity in Korean women. When we applied WC ≥ 85 cm as the cut-off for women, the prevalence of abdominal obesity in women was 23.1%, which was similar to the prevalence in men. The prevalence of abdominal obesity among women in 2001 was similar to that in 1998, whereas the prevalence of abdominal obesity among men (WC ≥ 90 cm) significantly increased from 1998 to 2001 (19.9% vs. 23.4%, P < 0.05).

Prevalence of metabolic syndrome

Recent papers have reported on the increased prevalence of metabolic disease with a lesser degree of obesity in Korea (1,15). The prevalence of metabolic syndrome in men according to the IDF, NCEP ATP III and modified NCEP ATP III definitions increased from 13.8%, 15.0% and 25.9% in 1998 to 16.8%, 17.4% and 30.7% in 2001. However, the prevalence rates of metabolic syndrome among women in 2001 were 16.1%, 18.2% and 31.6%, respectively, which were similar to those reported in 1998 (Table 1).

Among the components of metabolic syndrome between 1998 and 2001, there were increases in the prevalence rates of increased triglyceride levels and low high-density lipoprotein-cholesterol levels, but reductions in the prevalence rates of elevated blood glucose and raised blood pressure for both men and women (Table 1). These reductions in the prevalence rates of elevated blood glucose and elevated blood pressure might be due to increased monitoring and control of blood pressure and blood sugar in the general population owing to the introduction of public health initiatives in Korea.

Conclusion

The prevalence rates of overweight and obesity (BMI ≥ 25 kg m⁻²) and metabolic syndrome among Korean adults were high, with marked increases in men since 1998. Socioeconomic status has a considerable impact on the prevalence of obesity among the Korean population, and the patterns differ substantially between gender, with a positive association for men but a negative association for women. A multidimensional approach by individuals, society and public health programmes is necessary to prevent future increases in obesity and metabolic syndrome in Korea.

Conflict of interest statement

No conflict of interest was declared.
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