OBSERVATIONS

Decreasing Trends of the Prevalence of Diabetes and Obesity in Korean Women Aged 30–59 Years Over the Past Decade: Results From the Korean National Health and Nutrition Examination Survey, 2001–2010

The prevalence of diabetes in South Korea reached 9 to ~10% in adults aged ≥30 years and remained stable in the 2000s (1,2). Even though the Korean population is rapidly aging, the proportion of the elderly population aged ≥65 years has been increasing over the past 10 years from 7.2% of the total population in 2000 to 11.0% in 2010 (3). We investigated the change in the prevalence of diabetes in Korean adults aged ≥30 years with respect to age, using data from the Korean National Health and Nutritional Examination Survey (KNHANES) 2001–2010. Subjects with diabetes were defined as users of antidiabetic medication, including insulin, at the point of the survey or as individuals with an 8-h fasting plasma glucose level ≥126 mg/dL. Direct age standardization of the data was performed, using the Korean population aged ≥30 years in 2010 as the standard, and survey logistic regression and survey linear regression applying age standardization were used for trend analysis by survey year.

The crude prevalence of diabetes in adults aged ≥30 years was 10.6% (SE 0.6%) in 2001 and 10.2% (0.5%) in 2010 (Table 1). Even after adjusting for the age structure of the Korean population in 2010, there was no significant change during that period ($P = 0.901$). We performed the subsequent analysis by age group within each sex. Women in their 30s, 40s, and 50s showed a decreasing trend of the prevalence of diabetes, and the prevalence of diabetes in women aged 30–59 years decreased significantly from 6.9% in 2001 to 4.5% in 2010 ($P = 0.031$) (Table 1). After adjusting for BMI, a trend was maintained in women aged 30–59 years ($P = 0.073$). In contrast, the prevalence of diabetes in men did not changed except in those aged ≥60 years, which increased from 15.9% in 2001 to 21.6% in 2010 ($P = 0.025$).

In women aged 30–59 years, BMI (from 23.7 [0.1] kg/m^2 in 2001 to 23.3 [0.1] kg/m^2 in 2010, $P = 0.004$) and waist circumference (from 78.9 [0.2] cm in 2001 to 77.5 [0.3] cm in 2010, $P = 0.008$) decreased significantly during that period. Women exhibited a significant decrease in total daily energy intake ($P < 0.001$) and a significant increase in the proportions of women performing regular exercise, which was defined as those who exercised ≥30 min/day and ≥3 times a week, regardless of intensity from 11.5% (0.7%) in 2001 to 26.8% (1.3%) in 2010 ($P < 0.001$). In contrast, BMI in men aged 30–59 years increased significantly from 24.0 (0.1) kg/m^2 in 2001 to 24.3 (0.1) kg/m^2 in 2010 ($P = 0.002$).

In conclusion, the prevalence of diabetes among women aged 30–59 years showed a decreasing trend from 2001 to 2010. The reduction of obesity along with lifestyle improvements might be the causes of these changes.

Table 1—*The prevalence of diabetes among Korean adults aged ≥30 years in the KNHANES, 2001–2010*

	2001		2005		2007		2008		2009		2010		*P*	*P*
	n	% (SE)	*n*	% (SE)	*n*	% (SE)	*n*	% (SE)	*n*	% (SE)	*n*	% (SE)	value*	value†
Total														
Unadjusted‡	4,265	10.6 (0.6)	4,633	8.3 (0.5)	2,505	9.6 (0.8)	5,552	9.5 (0.5)	6,045	10.2 (0.5)	5,123	10.2 (0.5)	0.656	0.713
Adjusted**	4,265	10.8 (0.6)	4,633	9.2 (0.5)	2,505	10.2 (0.7)	5,552	10.0 (0.5)	6,045	10.8 (0.5)	5,123	10.8 (0.5)	0.901	0.782
Men														
Unadjusted‡	1,850	11.1 (0.8)	1,979	9.0 (0.7)	1,046	11.3 (1.2)	2,328	9.9 (0.7)	2,604	11.3 (0.7)	2,254	11.7 (0.8)	0.223	0.440
Adjusted**	1,850	10.9 (0.8)	1,979	9.9 (0.7)	1,046	11.8 (1.1)	2,328	10.3 (0.7)	2,604	11.7 (0.6)	2,254	12.0 (0.7)	0.557	0.902
Aged 30–59 years**	1,412	9.4 (0.9)	1,459	8.3 (0.8)	670	9.1 (1.3)	1,568	8.4 (0.8)	1,705	8.3 (0.7)	1,462	9.2 (0.8)	0.849	0.802
Aged ≥60 years**	438	15.9 (1.9)	520	15.4 (1.7)	376	20.9 (2.3)	760	16.6 (1.7)	899	22.9 (1.5)	792	21.6 (1.7)	0.011	0.025
Women														
Unadjusted‡	2,415	10.2 (0.6)	2,654	7.6 (0.6)	1,459	8.0 (0.9)	3,224	9.1 (0.6)	3,441	9.1 (0.6)	2,869	8.8 (0.7)	0.435	0.749
Adjusted**	2,415	11.1 (0.8)	2,654	8.5 (0.7)	1,459	8.7 (0.9)	3,224	9.8 (0.6)	3,441	9.9 (0.6)	2,869	9.6 (0.6)	0.192	0.401
Aged 30–59 years**	1,769	6.9 (0.7)	1,919	4.6 (0.6)	948	4.8 (0.9)	2,089	4.9 (0.5)	2,264	4.9 (0.5)	1,947	4.5 (0.6)	0.031	0.073
Aged ≥60 years**	646	21.3 (1.9)	735	17.8 (1.9)	511	18.3 (2.2)	1,135	21.6 (1.6)	1,177	22.1 (1.5)	922	22.0 (1.7)	0.403	0.358

*P values for trends from survey logistic regression to evaluate significance of trend from the 1998 to the 2010 KNHANES. †P values for trends from survey logistic regression adjusting BMI. ‡Crude prevalence of diabetes in the subjects aged ≥30 years without age standardization. **Prevalence of diabetes after age standardization, using the Korean population aged ≥30 years in the year 2010 as the standard.

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References

1. Kim DJ. The epidemiology of diabetes in Korea. Diabetes Metab J 2011;35:303–308
2. Choi YJ, Kim HC, Kim HM, Park SW, Kim J, Kim DJ. Prevalence and management of diabetes in Korean adults: Korea National Health and Nutrition Examination Surveys 1998-2005. Diabetes Care 2009;32:2016–2020
3. Statistics Korea. Population Projections for Korea: 2010–2040. Daejeon, Republic of Korea: Statistics Korea, 2011