

Differences in Food and Nutrient Intake Associated with Smoking Status of Korean

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ABSTRACT

The purpose of this study was to investigate the differences in food and nutrient intake by smoking status among Korean. Food and nutrient intake in relation to smoking status was studied in 7,370 adults, aged 20 years and older in 1998 Korean National Health and Nutrition Survey, in which 24 hour recall method was used for dietary survey. Information of subject's smoking status was collected by interview as a part of health behavior survey. Analysis of variance was used to test the differences in food and nutrition intake among subjects following after Duncan's multiple range test among four different smoking exposure categories. Food intake of male ex-smoker was the highest in most of the food groups among the four groups of daily current smoker, occasional current smoker, ex-smoker and never smoker. There was significant differences observed in food intake of sugar, fruits, beverage, seasoning by the smoking status. It had been also observed that significantly high intake of energy from carbohydrate in non smoker compare to current smoker especially in male subjects. Fiber and vitamin C intake was also higher among non-smoker (never smoker and ex-smoker) than current smoker. In general, food and nutrient intake pattern of ex-smoker resembled those of never smoker than those of current smoker. Not likely the observation from European and American studies, fat intake was not statistically different between smoker (current) and non-smoker (ex-smoker and never smoker) among Korean. (*J Community Nutrition* 4(1) : 22~28, 2002)

KEY WORDS : food consumption · nutrient consumption · smoking status · Korean National Nutrition Survey.

Introduction

It is known that health behavior of smoker differ from non-smokers ranging from alcohol consumption, exercise (Sherwood & Hennrikus 2000), weight control to eating habit (Boyle 2000). Since dietary factors play a role in the development of a number of degenerative disease (Yuan et al. 2001 ; Whichelow et al. 1991) for which an association with smoking has been already established, it is important to identify differences in food and nutrient intake pattern by smoking status (Midgette 1993 ; Morabia & Wynder 1990 ; Rust 2001). Result of study done by Herbert (1990) indicated that increased consumption of fruit and higher vitamin A and fiber in non-smokers compared to current smoker. A

similar but weaker relationship was reported for high fat, sweet food such as ice cream (Vecchia et al. 1992 ; Nutten et al. 1992 ; Whichelow et al. 1991 ; Subar 1990). An inverse association was found for other high-fat food items.

However, practice of dietary intake and health behavior of Korean differ from that of other countries (Ministry of Health & Social Welfare 1997). Studies of diet in relation to smoking of Korean carried out by many researchers. During the early 1990, immune response of diet for smoker was one of the area for interest (Kang 1994 ; Cho et al. 1993) and such interest lasted for a decade (Kim 2000). Effect of antioxidant such as vitamin C and vitamin E was the hot issue in that area (Kim 1998 ; Kim et al. 2000).

Few research were conducted to investigate the blood profile in relation to smoking status (Kim 2001). Most of the population studies were carried out for special age groups such as high school male students (Kim et al. 1998 ; Kim et al. 1998 ; Kim et al. 1998), high school female students (Kim et al. 1999), college male students (Lee et al.), college female students (Kim et al. 1997), male adults (Kwak et al.

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2000), elderly (Joung 1999) in a small scale sample survey. Kim (2001) carried out the study among rural population and Joung (1999) conducted survey in a limited area. Therefore there was not enough information to have general view of dietary pattern of Korean smoker representing Korean population.

In this study, we used the data from 1998 Korean National Health and Nutrition Survey (KNHANS) to identify the differences in dietary pattern of adult Korean by smoking status. It was also intended to compare the difference in dietary pattern of Korean smoker with that of other countries

Subjects and Methods

1. Study subjects

The study subjects participated in the Korean National Health and Nutrition Survey (Korean Health Industry Development Institute 1999 ; Ministry of Health and Welfare 1999) which was conducted in November and December 1998. The survey sample comprised of 11,525 persons (3,799 households) representing Korean population of 1year and older.

For present analyses, we utilized the data only from 7,370 adults aged 20 years and older.

2. Data collection & processing

The 1998 Korean National Health and Nutrition Survey (KNHANS) consisted of four parts of survey including 1) health interview survey on disease prevalence and health care service utilization 2) health examination survey on 6 major degenerative diseases 3) health behavior survey on smoking, drinking, exercise and sleeping and 4) nutrition survey.

Specially trained interviewer had conducted health behavior survey on drinking, smoking, exercise and sleeping with structured questionnaire. Cigarette smoking was investigated through questions on smoking status as never, ex-, or current smoker (who have smoked ≥ 1 cigarette/day for ≥ 1 year and ex-smokers those who had stopped ≥ 1 year before the survey, years since stopping smoking, age at starting, and number of cigarettes smoked per day. The questionnaire was designed specially to inquire information about smoking of people living in Korea. For the nutrition survey, 24 hour recall method had been used by trained dieticians. Subjects were interviewed at their home. Food portions were conver-

ted into weight according to standard estimators. Foods were subsequently grouped into 18 categories. Nutrient consumption was estimated using food composition table published by National Rural Living Science Institute (1996).

3. Statistical analysis

In analysis, subjects were categorized into four different smoking exposure groups such as daily current smoker, occasional current smoker, ex-smoker and never smoker. This classification is adopted from with the classification used at the published report (Ministry of Health and Welfare 1999, Health behavior Survey). The data were approximately normally distributed for the most measures. Age variable had been adjusted with standardization of subject number in each age group. Following after Duncan's multiple range test for the difference among the four groups by smoking status, analysis of variance (ANOVA) was used to test the difference between the subjects in the group. In all statistical testing performed, the null hypothesis was rejected at $p < 0.05$.

Results and Discussion

Table 1 shows the distribution of study subjects by age and sex. Out of 7,370 subjects, 46.5% were male and 53.5% were female. This sex distribution agrees within 3% error with that of the Korean population in this age group (National Statistical Office 1998). The strength of the 1998 Korean National Health and Nutrient Survey is that the population studied is representative of the Korean population with respect to gender, age and socio-demographic characteristics. Therefore food intake and smoking status data reflect the real situation of the Korean dietary and smoking pattern. Initially smoking status was classified into 4 categories of daily current smoker, occasional current smoker, ex-smoker, never smoker.

Table 1. Distribution of study subjects by age and sex

Variable	Unit : number (%)		
	Male	Female	Total
Age (years)			
20 - 29	653 (8.86)	766 (10.39)	1419 (19.25)
30 - 39	922 (12.51)	944 (12.81)	1866 (25.32)
40 - 49	720 (9.77)	741 (10.05)	1461 (19.82)
50 - 59	511 (6.93)	593 (8.05)	1104 (14.98)
60 - 64	242 (3.28)	304 (4.12)	546 (7.41)
≥ 65	378 (5.13)	596 (8.09)	974 (13.22)
Total	3426 (46.49)	3944 (53.51)	7370 (100.00)

As shown in Table 2, 66.9% of male and 6.7% of the female subjects belonged to the either daily or occasional current smoker category. The of male smoking was higher than 30% of English ('96 Health Survey of England), 35.6% of German (OECD, Health-Data 98) and 25.3% of American (US DHHS, 1998 RRFSS). The prevalence of female smoking was also higher than 27% of English, 21.5% of German and 20.9% of American. However each study used the slightly different classification of smoker category compared the classification used in this study.

Mean age of each group were 48.5years (daily current smoker), 49.1years (occasional current smoker), 49.8years (ex-smoker), 45.5years (never-smoker). And there was not statistical differences in mean age observed among four groups.

Table 3 shows the mean nutrient intake for the study subjects compared with the recommended dietary allowances (RDA) for Koreans of each age group. Both sexes of

subjects consumed less than RDA in energy, calcium and vitamin A. The results coincide with the most of the studied of Korean adults since 1996 (Lee et al. 1996 ; Ministry of Health & Social Welfare 1999 ; Kim & Han 1998 ; Kwak et al. 2000). Those studies also reported average intake of calorie and calcium were below RDA while protein, niacin and vitamin C were consumed over RDA. In case of female subjects, energy derived from carbohydrate, protein, and fat was 70%, 15%, and 15% respectively. Male subjects also showed similar results. This ratio may imply that Korean diet still heavily depends on carbohydrate as a source of energy compared to the American diet value of 46% (U.S. Department of Health and Human Services 1989).

Table 4 showed average consumption of selected food groups for smoking status for the male subjects. The most common findings of diet and smoking habits were a lower intake of fruit, vegetable and cereal and a higher consumption of fat, meat, dairy product, alcohol and coffee by

Table 2. Distribution of male and female subjects by smoking status

Unit : number (%) < > : Prevalence

Smoking Status	Sex				Total (n = 7370)
	Male		Female		
	(n = 3426)	Prevalence	(n = 3944)	Prevalence	
Daily current smoker	2159 (29.3)	< 63.4 >	236 (3.2)	< 6.0 >	2395 (32.5)
Occasional current smoker	118 (1.6)	< 3.5 >	29 (0.4)	< 0.7 >	147 (2.0)
Ex-smoker	560 (7.6)	< 16.5 >	103 (1.4)	< 2.6 >	663 (9.0)
Never smoker	575 (7.8)	< 16.6 >	3597 (48.8)	< 91.2 >	4140 (56.5)
Total	3404 (46.2)	< 100.0 >	3944 (53.8)	< 100.0 >	7370 (100.0)

Table 3. Mean nutrient intake and intake level based on RDA of study subjects (% RDA)

Nutrient	Male (n = 3305)	Female (n = 3865)	Total (n = 7161)
Energy (kcal)	2262.38 ± 16.69 (94.29 ± 0.67)	1782.58 ± 12.17 (92.34 ± 0.61)	2005.62 ± 10.50 (93.25 ± 0.45)
Protein (g)	87.45 ± 1.07 (125.82 ± 1.53)	66.88 ± 0.81 (121.61 ± 1.47)	76.44 ± 0.67 (123.57 ± 1.06)
Fat (g)	43.41 ± 0.69	32.16 ± 0.44	37.39 ± 0.40
Carbohydrates (g)	362.99 ± 2.49	309.01 ± 2.10	334.11 ± 1.64
C : P : F ratio	66.8 : 16.2 : 17.0	70.4 : 14.7 : 14.9	68.7 : 15.4 : 15.9
Fiber (g)	7.94 ± 0.09	6.81 ± 0.07	7.34 ± 0.05
Calcium (mg)	548.11 ± 7.13 (78.30 ± 1.01)	465.12 ± 5.84 (66.44 ± 0.83)	503.70 ± 4.58 (71.95 ± 0.65)
Phosphorus (mg)	1232.27 ± 11.07 (176.03 ± 1.58)	969.90 ± 7.72 (138.55 ± 1.10)	1091.87 ± 6.77 (155.98 ± 0.96)
Iron (mg)	14.65 ± 0.15 (122.11 ± 1.31)	11.91 ± 0.13 (82.93 ± 0.96)	13.18 ± 0.10 (101.14 ± 0.83)
Sodium (mg)	4668.77 ± 84.53	4378.99 ± 46.78	4978.55 ± 47.18
Potassium (mg)	2922.31 ± 27.08	2452.05 ± 23.45	2670.66 ± 17.98
Vitamin B ₁ (mg)	1.49 ± 0.01 (119.67 ± 1.26)	1.18 ± 0.01 (118.02 ± 1.13)	1.32 ± 0.01 (118.78 ± 0.84)
Vitamin B ₂ (mg)	1.17 ± 0.01 (80.50 ± 1.07)	0.92 ± 0.01 (77.37 ± 0.87)	1.04 ± 0.01 (78.82 ± 0.68)
Niacin (mg)	19.08 ± 0.26 (117.79 ± 1.60)	14.39 ± 0.15 (110.75 ± 1.18)	16.57 ± 0.15 (114.02 ± 0.97)
Vitamin C (mg)	127.36 ± 1.82 (181.95 ± 2.60)	129.21 ± 1.91 (184.59 ± 2.73)	128.35 ± 1.33 (183.36 ± 1.90)

mean ± SE : adjusted with age

* : C : P : F = Carbohydrates : Protein : Fat

Table 4. Mean per capita food intake by smoking status (Male)

Food	Smoking status			
	Daily current smoker (n = 2096)	Occasional current smoker (n = 111)	Ex-smoker (n = 542)	Never smoker (n = 556)
Cereals & grain products	374.22 ± 4.60	371.10 ± 18.74	393.69 ± 8.46	386.80 ± 8.44
Potatoes & starches	93.71 ± 7.66	106.75 ± 27.09	102.73 ± 13.68	124.29 ± 12.83
Sugars & sweets**	11.61 ± 0.51 ^b	6.97 ± 1.97 ^a	9.98 ± 0.89 ^b	10.52 ± 0.89 ^b
Pulse & pulse products	62.28 ± 2.43	62.68 ± 9.44	56.11 ± 4.35	61.90 ± 4.15
Nuts & seeds	8.71 ± 0.96	6.61 ± 3.42	6.36 ± 1.62	8.32 ± 1.62
Vegetables	361.42 ± 5.12	375.22 ± 20.83	369.93 ± 9.41	359.21 ± 9.37
Fungi & mushrooms**	19.38 ± 2.41 ^a	44.83 ± 8.20 ^b	23.45 ± 3.97 ^{ab}	25.00 ± 3.61 ^{ab}
Fruits	320.36 ± 12.01	331.72 ± 43.75	361.73 ± 19.35	373.06 ± 19.47
Seaweeds	18.50 ± 1.33	14.06 ± 5.04	18.51 ± 2.33	18.37 ± 2.20
Beverages***	278.99 ± 15.42 ^c	277.90 ± 62.51 ^c	214.16 ± 28.32 ^b	187.15 ± 28.10 ^a
Seasoning	33.79 ± 0.81	34.11 ± 3.28	32.18 ± 1.48	29.49 ± 1.47
Oil & fat (vegetable origin)	8.68 ± 0.36	6.80 ± 1.46	8.50 ± 0.66	7.33 ± 0.66
Total (vegetable origin)	1172.59 ± 15.09	1191.33 ± 61.29	1222.96 ± 27.77	1196.15 ± 27.65
Meats & meats products	116.16 ± 4.22 ^{ab}	123.89 ± 16.08 ^b	110.04 ± 7.52 ^{ab}	104.43 ± 7.40 ^a
Eggs	47.61 ± 1.97	42.50 ± 6.85	44.61 ± 3.39	46.19 ± 3.38
Fishes & shellfishes	87.25 ± 4.70	97.27 ± 18.52	101.82 ± 8.62	96.47 ± 8.44
Milk & milk products	201.20 ± 8.94	210.51 ± 27.87	207.52 ± 14.75	210.19 ± 13.58
Oil & fat (animal origin)	0.07 ± 0.03	0.05 ± 0.10	0.06 ± 0.05	0.08 ± 0.05
Total (animal origin)	206.82 ± 5.70	236.16 ± 23.14	223.63 ± 10.48	213.28 ± 10.44

* : Significantly different among four groups at p < 0.05 level by ANOVA following after Duncan's multiple range test.

** : Significantly different among four groups at p < 0.01 level by ANOVA following after Duncan's multiple range test.

*** : Significantly different among four groups at p < 0.001 level by ANOVA following after Duncan's multiple range test.

Table 5. Mean per capita food intake by smoking status (Female)

Food	Smoking status			
	Daily current smoker (n = 231)	Occasional current smoker (n = 30)	Ex-smoker (n = 102)	Never smoker (n = 3469)
Cereals & grain products	297.41 ± 10.71	315.80 ± 29.39	301.14 ± 16.27	320.63 ± 2.93
Potatoes & starches	114.74 ± 21.36	54.86 ± 71.73	119.68 ± 33.77	118.79 ± 6.06
Sugars & sweets	9.67 ± 1.32	7.50 ± 3.73	8.65 ± 2.14	8.25 ± 0.36
Pulse & pulse products	49.46 ± 5.85	38.89 ± 14.61	43.06 ± 8.57	46.88 ± 1.48
Nuts & seeds	5.92 ± 2.90	0.32 ± 6.94	8.75 ± 4.80	7.94 ± 0.80
Vegetables	311.60 ± 14.73	335.19 ± 40.23	260.14 ± 22.37	297.45 ± 4.02
Fungi & mushrooms	8.29 ± 7.54	25.26 ± 21.74	11.22 ± 10.23	23.11 ± 2.00
Fruits	347.87 ± 36.15	254.97 ± 90.92	359.02 ± 50.97	353.74 ± 8.52
Seaweeds	26.09 ± 4.12	24.17 ± 10.22	14.99 ± 5.66	16.63 ± 0.99
Beverages*	188.69 ± 21.68 ^b	199.58 ± 64.00 ^b	190.81 ± 35.42 ^b	104.82 ± 7.12 ^a
Seasoning	24.41 ± 1.77	31.77 ± 5.00	22.22 ± 2.69	24.21 ± 0.48
Total (vegetable origin)	967.14 ± 34.59	940.52 ± 94.91	919.78 ± 52.31	986.16 ± 9.46
Meats & meats products	87.06 ± 9.81	71.97 ± 26.81	92.98 ± 15.12	82.24 ± 2.58
Eggs	53.88 ± 5.24	48.29 ± 16.27	32.32 ± 7.70	35.70 ± 1.49
Fishes & shellfishes	60.70 ± 8.68	53.26 ± 23.27	89.24 ± 13.65	70.30 ± 2.33
Milk & milk products	192.98 ± 21.49	341.37 ± 73.66	228.42 ± 27.07	203.01 ± 5.95
Oil & fat (animal origin)	0.03 ± 0.07	0.22 ± 0.20	0.14 ± 0.11	0.08 ± 0.02
Total (animal origin)	150.02 ± 11.74	131.80 ± 32.21	181.44 ± 17.76	160.47 ± 3.21

* : Significantly different among four groups at p < 0.05 level by ANOVA following after Duncan's multiple range test.

** : Significantly different among four groups at p < 0.01 level by ANOVA following after Duncan's multiple range test.

*** : Significantly different among four groups at p < 0.001 level by ANOVA following after Duncan's multiple range test.

smoker than by never and ex-smokers in the American and European studies (Nuttens et al. 1992 ; Morabia et al. 1990 ; Subar et al. 1990 ; La Vecchia et al. 1992 ; D'Avanzo et al. 1997 ; Whichelow et al. 1991 ; Hoogerbrugge N et al. 2001 ; Rust et al. 2001) . There were statistically significant differences in sugar,

Table 6. Mean per capita nutrient intake by smoking status (Male)

Nutrient	Smoking status			
	Daily current smoker (n = 2096)	Occasional current smoker (n = 111)	Ex-smoker (n = 542)	Never smoker (n = 556)
Energy (kcal)	2183.00 ± 22.58	2185.58 ± 91.73	2248.09 ± 41.56	2185.53 ± 41.38
Protein (g)	82.89 ± 1.47	83.04 ± 5.99	88.67 ± 2.71	82.50 ± 2.70
Fat (g)	39.95 ± 0.94	42.53 ± 3.80	41.16 ± 1.72	38.13 ± 1.71
Carbohydrates (g)**	351.78 ± 3.40 ^o	346.46 ± 13.80 ^o	368.41 ± 6.25 ^o	368.32 ± 6.22 ^b
Energy from carbohydrates (%)	66.23 ± 0.30	65.89 ± 1.21	67.42 ± 0.55	69.12 ± 0.55
Energy from protein (%)	15.16 ± 0.19	15.03 ± 0.77	15.42 ± 0.35	15.04 ± 0.35
Energy from fat (%)	15.37 ± 0.20	15.65 ± 0.81	15.58 ± 0.37	14.47 ± 0.37
Fiber (g)*	7.53 ± 0.13 ^o	7.73 ± 0.52 ^o	8.05 ± 0.23 ^b	8.11 ± 0.23 ^b
Calcium (mg)	523.81 ± 9.75	579.50 ± 39.61	530.33 ± 17.95	536.80 ± 17.87
Phosphorus (mg)	1168.83 ± 15.01	1228.04 ± 60.96	1220.55 ± 27.62	1189.96 ± 27.50
Iron (mg)	14.00 ± 0.22	13.51 ± 0.88	14.67 ± 0.40	14.47 ± 0.40
Sodium (mg)	5587.35 ± 117.51	5660.07 ± 477.33	5314.92 ± 216.27	5204.28 ± 215.32
Potassium (mg)	2758.46 ± 36.60	2840.78 ± 148.69	2945.44 ± 67.37	2805.02 ± 67.07
Vitamin A (R.E.)	660.47 ± 18.91	644.14 ± 76.79	706.54 ± 34.79	653.42 ± 34.64
Vitamin B ₁ (mg)	1.40 ± 0.02	1.54 ± 0.09	1.49 ± 0.04	1.44 ± 0.04
Vitamin B ₂ (mg)	1.09 ± 0.02	1.14 ± 0.09	1.13 ± 0.04	1.11 ± 0.04
Niacin (mg)	18.04 ± 0.37	18.69 ± 1.50	18.85 ± 0.68	18.15 ± 0.68
Vitamin C (mg)***	117.05 ± 2.51 ^o	126.57 ± 10.21 ^o	135.36 ± 4.63 ^b	131.06 ± 4.61 ^b

* : Significantly different among four groups at p < 0.05 level by ANOVA following after Duncan's multiple range test.

** : Significantly different among four groups at p < 0.01 level by ANOVA following after Duncan's multiple range test.

*** : Significantly different among four groups at p < 0.001 level by ANOVA following after Duncan's multiple range test.

Table 7. Mean per capita nutrient intake by smoking status (Female)

Nutrient	Smoking status			
	Daily current smoker (n = 231)	Occasional current smoker (n = 30)	Ex-smoker (n = 102)	Never smoker (n = 3493)
Energy (kcal)	1672.03 ± 49.88	1619.18 ± 136.87	1734.14 ± 75.44	1751.75 ± 13.65 ^{NS}
Protein (g)	61.02 ± 3.37	57.59 ± 9.25	70.59 ± 5.10	65.42 ± 0.92
Fat (g)	28.55 ± 1.74	25.05 ± 4.77	33.80 ± 2.63	29.91 ± 0.48
Carbohydrates (g)	286.07 ± 8.78	290.61 ± 24.09	294.41 ± 13.28	308.42 ± 2.40
Energy from carbohydrates (%)	70.12 ± 0.71	73.75 ± 1.96	70.06 ± 1.08	71.57 ± 0.20
Energy from protein (%)	14.29 ± 0.68	13.70 ± 1.86	17.24 ± 1.03	14.76 ± 0.19
Energy from fat (%)	14.36 ± 0.55	12.47 ± 1.50	15.67 ± 0.83	14.40 ± 0.15
Fiber (g)	6.50 ± 0.31	6.49 ± 0.86	6.17 ± 0.47	6.75 ± 0.09
Calcium (mg)	447.65 ± 24.36	467.24 ± 66.83	422.37 ± 36.84	456.83 ± 6.66
Phosphorus (mg)	913.16 ± 31.57	886.02 ± 86.62	937.63 ± 47.74	949.28 ± 8.64
Iron (mg)	11.40 ± 0.57	10.77 ± 1.55	10.99 ± 0.86	11.71 ± 0.15
Sodium (mg)	4470.31 ± 194.38	4042.14 ± 533.35	3943.75 ± 293.98	4298.17 ± 53.17
Potassium (mg)	2257.86 ± 96.21	2270.49 ± 263.99	2516.89 ± 145.51	2386.89 ± 26.32
Vitamin A (R.E.)	577.10 ± 45.50	612.48 ± 124.84	457.61 ± 68.81	542.13 ± 12.45
Vitamin B ₁ (mg)	1.07 ± 0.04	1.01 ± 0.13	1.04 ± 0.07	1.15 ± 0.01
Vitamin B ₂ (mg)	0.87 ± 0.04	0.79 ± 0.12	0.86 ± 0.06	0.88 ± 0.01
Niacin (mg)	12.86 ± 0.63	12.66 ± 1.73	14.96 ± 0.95	13.94 ± 0.17
Vitamin C (mg)	112.69 ± 7.94	119.95 ± 21.78	101.41 ± 12.01	127.05 ± 2.17

NS : not significantly different

fungi and mushroom and beverage intake among the four groups. Beverage consumption was significantly higher among current smoker (daily and occasional) than that of non smoker (ex-smoker and never smoker). Emmos & Colleges (1994) identified dietary fat reduction by increasing fruit and vegetable as one possible gateway preventing degenerative disease for smoker. The idea had been strongly supported by Doherty and Colleges (1998) to prevent especially cardiovascular disease. However, food intake pattern of female smoker (Table 5) was slightly different from that of male smoker.

Increased intake of beverage had been observed among current smoker than and never smoker. This observation was similar to that of male subjects. This results may imply that high consumption of beverage is the typical dietary pattern of Korean smoker of both sexes.

In the previous study (Kim 2001) of the same subject showed 81.5% of male subject and 52.1% of female subject were belonged to the drinker categories. Considering such a high prevalence of drinking of the study subject, all the analysis were done with the control of drinking status (drinking status adjusted)

Table 6 shows mean nutrient intake of the male subject by smoking status. It had been observed that significantly high intake of energy from carbohydrate in non smoker (ex-smoker and never smoker) compared to current smoker (daily and occasional). Fiber and vitamin C intake was higher among non smoker (never smoker and ex-smoker). The similar finding was not found in case of female subjects (Table 7). Allen and Collegues (2000) had observed similar finding from their subjects. Eventhough their subjects were investigated after short-term smoking cessation, D'avanzo and colleges (1977) also observed the similar findinge from their Italian subjects. Fiber and vitamin C intake of non female smoker was not significantly higher than that of current smoker unlikely their male counterpart. In general, food and nutrient intake pattern of ex-smoker for both sexes resembled those of never smoker than those of current smoker. Not like the European (Hogerbrugge et al. 2001 ; Nuttens et al. 1992 ; Wichelow et al. 1991), Australian (Rust 2001), British (Wichelow et al. 1991), French (Nuttens et al. 1991) and American studies (La Vecchia et al. 1992 ; Morabia and Wynder 1990 ; Ma et al. 2000, Subar et al. 1990) fat intake was not statistically different between the Korean subjects by smoking status for both sexes.

Conclusion

This study was conducted to investigate the differences in food & nutrient intake by smoking status from representing sample of Korean population. For population aged 20 years and older from 1998 Korean National Health and Nutrition Survey was used for the analysis. There were significant differences observed in food intake of vegetable origins such as sugar, fruit, beverage, seasoning by the smoking status for the male subject. It had also been observed that significantly increased intake of energy from carbohydrate in non smoker compared to the current smoker. In general food and nutrient intake pattern of ex-smoker resembled those of never smoker than those of current smoker for both sexes.

Not like the European and American studies, fat intake was not statistically different among Korean by smoking status for both sexes.

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