

Alcohol Intake in Relation to Cardiovascular Risk Factors among (Middle Age) South Korean Men*

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Introduction

Since 1970, the main cause of death in South Korea has changed from communicable Disease to noncommunicable diseases. As in other industrialized countries, the rapidly increased economic development in South Korea has been associated with increased mortality rates of coronary heart disease rate increased to 13.1 per 100,000 in 1995 from 4.3 per 100,000 persons in 1986 (Korean Health Statistics, 1997).

And the growing prevalence of alcohol related disorders in Korea has posed significant position in medical practice(Ja-Young Kim and Hong-Soo Lee, 1995) .

An inverse relationship between moderate alcohol consumption and coronary heart disease (CHD) has been found in epidemiological studies of diverse designs (Flegal & Cauley, 1985 ; Moore & Pearson,1986 ; Criqui,1987 ; Castelli, Gordon & Hjortland, et al, 1987 ; Siscovick, Weiss & Fox, 1986). Some studies however have reported conflicting results(Colsher & Wallace, 1989). One of the studies found a strong association between

the number of drinks per occasion and CHD but little association between average weekly consumption and CHD. (Anda, Williamson & Remington, 1988).

Although alcohol use is directly related to some diseases (e.g., cirrhosis of the liver), the effects of alcohol use on total mortality and coronary heart disease appear to form a U-shaped curve, with the lowest mortality among moderate drinkers and increased mortality among abstainers and heavy drinkers. The public health implications of these findings, however, are not clear because of concerns over other harmful effects of increased alcohol consumption (Peel,1993 ; Shaper AG,1993 ; Stampfer MJ, Rimm EB & Walsh DC, 1993). There is considerable evidence that both nondrinkers (abstainers) and heavy drinkers have higher rates of cardiovascular disease in general, and coronary heart disease in particular, than do light or moderate drinkers. The Lipid Research Clinics Follow-up Study provided information from a prospective study of more than 7400 men and women in 10 North American cities followed for an average of 8.5

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years(Criqui, Cowan and, Tyroler HA, et al. 1987). In that study, moderate alcohol consumption was weakly protective for cardiovascular disease, cardiovascular disease mortality.

There have been few studies that examine the associations between drinking behaviors and cardiovascular risk factors of Korean males.

Similar to studies in western countries, the following general hypothesis are examined : there will be positive associations between alcohol intake, duration of drinking and types of alcohol, and cardiovascular risk factors.

The purpose of this study were to examine the drinking patterns of middle-age South Korea factory workers and the relationship between alcohol intake and risk factors of cardiovascular disease.

Methods

Data for this study were collected in 1996 as part of annual health examinations keep at a steel company an urban area in Kungpook Province, South Korea.

The study subjects included 3444 of the 12,000 male workers who worked at a factory, 3444 were age 40 or more. Between May and October, 1996, all of the male workers were tested for total cholesterol(TC), and triglyceride(TG), and uric acid with 10 ml fasting blood. Height, weight, blood pressure(on the right arm of seated workers who had rested for 5-10 minute) and a resting EKG was obtained with the subject in the supine position. A self-administered questionnaire was assessed past medical history, current health status, life style including drinking quantity and duration. Subjects were classified as non-drinkers(n=649, 18.9%), ex-drinkers(n= 70, 2.0%), or current drinkers(n=2725, 79.1%). Ex-drinkers were defined as abstainers for the past 3 months and over.

Contents of questionnaire about Alcohol drinking.

1. How many years ago did you stopped drinking ?
In the current drinkers.

How many times do you drink? : 7 categories of drinking status ; every day, almost everyday, 3-4times/week, 1-2time/week, 2-3times/month, 1time/month, below 1time/month.

2. How much do you drink Beer and Soju monthly in reference one bottle of Beer and one bottle of soju?

1-2, 3-4, 5-6, 7-8, 9-10, 11-12, above 12.

Which were converted to grams of absolute alcohol(ethanol) per week by Hillers et al's study (beer 45g/ℓ and soju 250g/ℓ).

Smoking duration and daliy smoking, and exercise-duration/week and kinds of exercise were evaluated by self report. Alcohol consumption was measured by a quantity-frequency index adapted to the pattern of alcoholic beverage consumption in South Korea. Risk factors of cardiovascular disease was classified as normal or abnormal (Table 1). Adjusted odds ratio of drinking behavior(dummy variables) were calculated by a logistic regression method and 95% confidence intervals(95% C.I.) were calculated of participants blood pressure, lipids, uric acid and EKG by reference in non drinker.

Table 1. Classification of criteria for dependent variables

Dependent variables	Criteria	
	Normal	Abnormal
Systolic blood pressure ⁺	< 130mmHg	≤ 130mmHg
Diastolic blood pressure ⁺	< 85mmHg	≤ 85mmHg
Total Cholesterol ⁺⁺	< 200mg/dl	≤ 200mg/dl
Triglyceride ⁺⁺	< 160mg/dl	≤ 160mg/dl
Uric acid ⁺⁺	< 7mg/dl	≤ 7mg/dl
EKG	Normal	Abnormal (Left Ventricular Hypertrophy)

Source : ⁺ NIH,1993, ⁺⁺ Frances Fischbach ,1995

Finding

The characteristics of the study populations are presented in Table 2.

Table 2. Sample characteristics, values of blood pressure, lipids, uric acid and abnormal of EKG

	Mean	Min	Max	N*
Age(years)	44.4± 3.9	40	59	
Present Smokers(n=2054, 59.7%)				
Cigarettes/day	15.0± 6.7	1	50	2006
Smoking duration(years)	18.4± 6.5	1	38	2011
Exsmoker (n=615, 17.8%)				
Nonsmoker (n=775, 22.5%)				
Present Drinking(n=2725, 79.1%)				
Drinking duration(years)	20.2± 5.8	1	37	2725
Alcohol Beer(ml/week)	560.3±259.1	180	1620	1843
(g/week)	25.2± 8.2	5.7	51.5	1843
Soju (ml/week)	269.2±153.4	45	1080	2225
(g/week)	67.1± 30.2	8.9	214.2	2225
Total (g/week)	87.8± 35.8	5.7	221.4	2537
Exdrinker (n= 70, 2.0%)				
Nondrinker (n=649, 18.9%)				
Exercise Present exercise	3287(95.4%)			
Mean(hours/week)	2.8±1.4/week			
History of hypertension	3.7%(128)			
SBP(mmHg)	122.5± 13.5	90	190	3432
DBP(mmHg)	78.1± 10.5	50	130	3432
TC(mg/dl)	186.5± 33.6	100	760	3444
TG(mg/ml)	142.1± 87.5	13	877	3443
Uric acid(mmHg)	5.2± 1.1	2.0	9.3	3444
BMI(kg/m ²)	23.2± 2.4	13.4	36.8	3436
EKG(LVH)	1.4%(n=47)			

Note : Body mass index(BMI) was calculated as weight(in kilograms) divided by the square of height(meters squared).

* Exclude missing value.

The mean age of the study population are 44.4±3.9 years old.

Cigarettes amount per day, duration of present smokers are shown 15.0 cigarettes and 18.4 years, respectively. Exsmokers and non smoker took part in the study with response rates of 17.9%(615 persons) and 22.5%(775 persons) respectively.

Subjects were classified as non-drinkers(18.9%, 649 persons), ex-drinkers (2.0%, 70 persons), or current drinkers (79.1%, 2725 persons) who averaged > 100.5g/week or ≥ 100.5g/week of eth-

anol. Ex-drinkers were defined as abstainers for the past 3 months and over.

Distribution of ethanol intake in the surveyed population(Table 2) was somewhat lower than that in the Japanes sample(Iso, Kitamura et al, 1995)

The 95.4% of the sample population is exercising any kind of exercise. The mean exercise hour a week among present exercising population was 2.8±1.4/week.

Mean±SD values of cardiovascular risk charac-

teristics were 122.5 ± 13.5 mmHg for systolic and 78.1 ± 10.5 mmHg for diastolic blood pressure, 186.5 ± 33.6 mg/ml for serum total cholesterol, 142.1 ± 87.5 mg/ml for triglyceride, and 5.2 ± 1.1 for Uric acid.

Abnormal(Left Ventricular Hypertrophy) result of EKG took part in this study with result rates of 1.4% (Table 2).

Each kind of amount of alcohol intake is also shown in Table 3.

Drinking amount(less than median group and more than median group) is classified by median (100.5gm). This data analyzed adjusted for age, smoking amount, smoking length, exercise, drinking duration and alcoholic beverage sorts by a logistic regression method. Odds ratio of the ab-

stainer to the reference in non-drinker for SBP (OR=1.02), DBP(OR=0.86), TC(OR=1.02), TG (OR=1.15), Uric acid(OR=0.86) and EKG (OR=1.03) were not statistically significant. Odds ratios for drinkers of less than median to the reference in non-drinker for SBP(OR=0.96), DBP(OR=1.05), TC(OR=1.01), TG(OR=0.85), uric acid(OR=1.16) and EKG(OR=0.88) were not statistically significant and almost 1 or less than 1 besides that of DBP and uric acid.

But Odds ratio for the drinkers of more than median to the reference in non-drinker for SBP (OR=1.21), TC(OR=1.02), TG(OR=1.16), Uric acid(OR=0.98) and EKG(OR=0.99) were not statistically significant. But Compared with that in non-drinkers, the-age, smoking amount,

Table 3. Adjust odds ratio^{##} and 95% confidence intervals of blood pressure, lipids, uric acid and EKG by amount of alcohol intake in men aged 40–59 years

	Non (n=649)	Ex-drinker (n=70)	Alcohol intake [#]	
			Light (less than median) (n=1239)	Moderate (greater than median) (n=1276)
SBP	1.0	1.02 (0.63–1.66)	0.96 (0.74–1.25)	1.21 (0.92–1.59)
DBP	1.0	0.86 (0.53–1.37)	1.05 (0.82–1.34)	1.33* (1.03–1.71)
TC	1.0	1.02 (0.47–2.18)	1.01 (0.66–1.53)	1.02 (0.59–1.41)
TG	1.0	1.15 (0.64–2.05)	0.85 (0.62–1.18)	1.16 (0.84–1.62)
Uric acid	1.0	0.86 (0.53–1.37)	1.16 (0.84–1.62)	0.98 (0.74–1.25)
EKG	1.0	1.03 (0.77–1.66)	0.88 (0.71–1.08)	0.99 (0.79–1.09)

[#] Alcohol consumption was measured by a quantity–frequency index adapted to the pattern of alcoholic beverage consumption in South Korea. Exclude missing value(total member=3234).

[#] Drinking amount(light and moderate) is classified by median(100.5gm/week).

^{##} Adjusted odds ratio of amount of alcohol intake were calculated for age, smoking amount, smoking length, exercise, drinking duration, and alcoholic beverage sorts by a logistic regression method.

* p<0.05

smoking length, exercise, drinking duration, and alcoholic beverage sorts adjusted odds ratio of DBP was 1.33 times significantly higher ($P < 0.05$) in drinkers of more than median.

This data analyzed adjusted for age, smoking amount, smoking length, exercise, drinking duration and alcoholic beverage sorts by a logistic regression method.

Each kind of duration of alcohol intake is also shown in Table 4.

Compared with that in non-drinkers, the age, smoking amount, smoking length, exercise, drinking amount, and alcoholic beverage sorts adjusted odds ratio of SBP and DBP were not statistically significant. A J-shaped relationship was suggested between drinking duration, and SBP and DBP of cardiovascular risk factors: drinkers of abstainer had a slightly lower risk

(Odds ratio of SBP=0.91 and Odds ratio of DBP=0.88), drinkers of below 1 year for drink duration (Odds ratio of SBP=0.88 and Odds ratio of SBP=1.18) and drinker of 2-10 years for drinking duration (Odds ratio of SBP=1.14 and Odds ratio of DBP=1.23), drinker of 11-20 years for drinking duration (Odds ratio of SBP=1.18 and Odds ratio of DBP=1.27) and drinker of ≤ 21 years (Odds ratio of SBP=1.20 and Odds ratio of DBP=1.27) had a higher risk than non-drinker (odds ratio=1). And Odds ratio of Blood pressure by reference in non drinkers had gradually higher risk.

Alcoholic beverage sorts is classified by beer, soju, and beer and soju. This data analyzed adjusted for age, smoking amount, smoking length, exercise, drinking amount and drinking duration by a logistic regression method.

Table 4. Adjusted odds ratio and confidence interval of blood pressure, lipids, uric acid and EKG reference in non-drinker**

	Non (n=649)	Ex-drinkers (n=70)	Drinking duration(year)*			
			≤ 1 Drinker (n=61)	2-10 Drinker (n=234)	11-20 Drinker (n=250)	≥ 21 Drinker (n=2153)
SBP	1.0	0.88 (0.48-1.60)	0.88 (0.37-1.65)	1.14 (0.70-1.75)	1.18 (0.78-1.78)	1.20 (0.90-1.59)
DBP	1.0	0.91 (0.40-1.27)	1.18 (0.65-2.15)	1.23 (0.84-1.78)	1.27 (0.89-1.87)	1.27 (0.98-1.62)
TC	1.0	1.83 (0.32-2.15)	1.82 (0.72-4.57)	0.97 (0.48-1.91)	0.83 (0.41-1.67)	1.19 (0.78-1.83)
TG	1.0	1.15 (0.55-2.40)	0.67 (0.24-1.85)	1.14 (0.68-1.89)	1.21 (0.74-1.97)	1.01 (0.71-1.44)
Uric acid	1.0	0.86 (0.33-2.21)	1.33 (0.53-2.33)	1.04 (0.57-2.76)	0.67 (0.34-1.33)	1.11 (0.74-1.67)
EKG	1.0	1.28 (0.79-2.05)	0.88 (0.51-1.54)	1.06 (0.77-1.46)	0.75 (0.54-1.03)	1.10 (0.88-1.38)

* Exclude missing value (total member=3417).

** Adjusted odds ratio of amount of alcohol intake were calculated for age, smoking amount, smoking length, exercise, drinking amount, and alcoholic beverage sorts by a logistic regression method.

Each kind of alcoholic beverage sorts of drinking habit is also shown in Table 5. Odds ratio of the abstainer to the reference in non-drinker for SBP (OR=1.05), DBP(OR=0.91), TC(OR=0.97), TG (OR=1.08), Uric acid(OR=0.78) and EKG(OR=1.05) were not statistically significant. Odds ratios for drinkers of beer to the reference in non-drinker for SBP(OR=0.94), DBP(OR=1.00), TC(OR=1.03), TG(OR=0.98), uric acid(OR=1.04) and EKG(OR=0.82) were not statistically significant and almost 1 or less than 1.

But Odds ratio for the drinkers of soju to the reference in non-drinker for SBP(OR=1.28), TC (OR=1.34), TG(OR=1.06), Uric acid(OR=1.16) andG(OR=1.00) were not statistically significant and almost 1 or more than 1. Odds ratios for drinkers of beer and soju to the reference in

non-drinker for SBP(OR=0.80), DBP(OR=0.85), TC(OR=0.93), TG(OR=0.93), uric acid (OR=1.16) and EKG(OR=0.83) were not statistically significant and less than 1 besides that of uric acid. Compared with that in non-drinkers, the-age, smoking amount, smoking length, exercise, drinking amount and drinking duration adjusted odds ratio of DBP was 1.38 times significantly higher(P<0.01) in drinkers of soju.

Discussion

Habitual drinking, either in social settings or at home, is common among Korean middle-aged men(Kim, 1989). Most alcohol is consumed by men, compare to 47% men drink alcohol every day at a Japanese study(Public Health Breau,

Table 5. Adjusted odds ratio and 95% confidence interval of blood pressure, lipids, uric acid and EKGby reference in non[#]

	Non (N=649)	Ex-drinkers (N=70)	Alcohol beverage sorts ^{##}		
			Beer Drinker (N=317)	Soju Drinker (N=690)	Beer and Soju ^{###} Drinker (N=1532)
SBP	1.0	1.05 (0.62-1.80)	0.94 (0.68-1.28)	1.28 (0.96-1.66)	0.80 (0.60-1.07)
DBP	1.0	0.91 (0.54-1.51)	1.00 (0.76-1.33)	1.38* (1.09-1.75)	0.85 (0.65-1.11)
TC	1.0	0.97 (0.42-2.27)	1.03 (0.63-1.70)	1.34 (0.91-1.98)	0.93 (0.59-1.48)
TG	1.0	1.08 (0.62-2.22)	0.98 (0.67-1.44)	1.06 (0.48-1.45)	0.93 (0.66-1.32)
Uric acid	1.0	0.78 (0.34-1.83)	1.04 (0.65-1.67)	1.16 (0.79-1.71)	1.16 (0.75-1.79)
EKG	1.0	1.05 (0.82-1.90)	0.82 (0.64-1.98)	1.00 (0.82-1.24)	0.83 (0.66-1.40)

* <0.01

[#] Exclude missing value(total member=3258).

^{##} Adjusted odds ratio of amount of alcohol intake were calculated for age, smoking amount, smoking length, exercise, drinking amount and duration by a logistic regression method.

^{###} 1532(45.0%) persons drink mix of beer and soju.

1982), 79.1% men drink alcohol more one time every week at this study. A study of alcohol consumption, blood pressure and stroke mortality in Japan, understanding the effects of alcohol intake on stroke and other cardiovascular disease is an important issue for public health(Hirotsugu et al, 1984).

Relative mortality was increased among the men who had reported non-use of alcohol in the screening questionair. Most of these men, however, had chronic disease as the reason for their abstention, or even a past history of alcoholism (Petersen, Trel, & Kristenson, 1982).

The daily ethanol intake and its duration seem to be the most important factors in the genesis of physical damage but the question of a safe limit of ethanol consumption has not been resolved (Thomason, & Majumdar, 1982). In this study, Compared with that in non-drinkers, the-age, smoking amount, smoking length, exercise, drinking duration, and alcoholic beverage sorts adjusted odds ratio of SBP(OR=1.21), TC(OR=1.02), TG(OR=1.16), Uric acid(OR=0.98) and EKG(OR=0.99) were not statistically significant in the drinkers of more than median. But odds ratio of DBP was 1.33 times significantly higher ($P<0.05$) in drinkers of more than median. As another epidemiological studies (Ushima et al, 1984 ; Beilin-LJ & Puddey-IB, 1993) for alcohol intake, this result suggest that amount of alcohol intake is related blood pressure level, especially DBP. Thus, alcohol may account for a higher level of blood pressure and a higher prevalence of hypertension in men(Ueshima & Asakura, 1984).

In this study, a J-shaped curve relationship was suggested between drinking duration, and SBP and DBP of cardiovascular risk factors : drinkers of ex-drinkers had a slightly lower risk (Odds ratio of SBP=0.91 and Odds ratio of DBP=0.88), drinkers of below 1 year for drink duration(Odds ratio od SBP=0.88 and Odds ratio of SBP=1.18) and drinker of 2-10 years for drinking duration(Odds ratio of SBP=1.14 and

Odds ratio of DBP=1.23), drinker of 11-20 years for drinking duration(Odds ratio of SBP=1.18 and Odds ratio of DBP=1.27) and drinker of ≤ 21 years(Odds ratio of SBP =1.20 and Odds ratio of DBP=1.27) had a higher risk than non-drinker (odds ratio=1). And Odds ratio of Blood pressure by reference in non drinkers had gradually higher risk. The U-shaped curve relating quantity of alcohol consumed and health is an artefact of selection of some individuals with high consumption and high risk migrating to the no-consumption group but retaining a high risk at the Oxford vegetarian study(Thorogood-M et al, 1993). On a town basis, cardiovascular mortality was associated with mean systolic blood pressure and the prevalence of heavy cigarette smoking and heavy alcohol consumption.

In epidemiological studies, classification of moderate alcohol consumption ranges from half a drink per day(or less) in some studies up to six drinks a day in others. In this study, Alcohol consumption was measured by a quantity-frequency index adapted to the pattern of alcoholic beverage consumption in South Korea. Drinking amount(light and moderate) is classified by median(100.5 gm/week). However, tolerance to alcohol depends on age, sex, body size, and cultural situation ; therefore, no single global definition of "moderte" can be made(Stampfer, Rimm & Chapman, 1993).

Alcohol drinking was associated with an elevation in the blood pressure in men of all ages. When male non-drinkers were compared with male drinkers, a 7-18% increase in the number of hypertensives was found for male everyday drinkers as compared to their non-drinking counterparts.

Ex-drinkers were also shown to have a higher prevalence of hypertension, although their mean blood pressure was almost the same as the occasional drinkers. This discrepancy may have been due to differences in the calculation methods for hypertension prevalence, and for

mean blood pressure level of each drinking category. Therefore, it may be true that ex-drinkers had a higher prevalence of hypertension in spite of quitting alcohol. Also, it may be considered that the after quitting alcohol. Some studies do not separate ex-drinkers from lifelong non-drinkers. This may suggest an important source of error in other surveys where drinkers have been compared with a combination of lifelong non-drinkers and ex-drinkers(Bulpitt, Shipley & Semmence, 1987).

There are a number of possible explanations for the discrepancy between the results for male and female. First, Japanese women consume small amounts of alcohol compared with men, even when they drink everyday. Second, since the number of everyday women drinkers was small. Other confounding factors, i.e. social class, job, and income may have obscured the relationship between alcohol drinking and blood pressure; This study suggests that the increase in prevalence of hypertension in everyday drinkers was almost the same in men below the age of 50 years(Ueshima, 1987). Data from the Kaiser foundation also showed that both women and men who drank more than one drink per day had higher blood pressure than those who did not. Third, alcohol drinking in males may be subject to a greater number of confounding factors than in females, i.e. stress, high salt consumption and irregular lifestyles. In this regard, further studies are needed to clarify whether other confounding factors can account for the relationship between alcohol drinking and high blood pressure.

The prevalence of alcohol drinking and the daily alcohol consumption of Japanese men is almost the same as for American and British men(Ueshima, 1987). In Japan, an everyday male drinker consumes about 6ml of ethanol per day (Ueshima, 1987). This study shows that the present drinkers consume about 59.8+35.8gm of ethanol per week.

Although some studies have reported conflicting results(Colsher & Wallace, 1989), we confirmed in a previous study the existence of close relationship between the quantity of alcohol consumed and the level of blood pressure, which was independent of age and obesity. This relationship was present even in men who drank less than 160 ml of ethanol/week(2-3drank/day). In moderate-to-heavy drinkers, the prevalence of systolic hypertension(>140 mmHg) was four times. These findings identify alcohol as an important environmental factor in the incidence of hypertension.

It is well documented by epidemiological studies that alcohol drinking may associated with high blood pressure(Ueshima, et al, 1984; Ueshima and Asakura, 1984).

The increase in alcohol consumption and relative weight was significantly related to the increase in blood pressure levels in Japan. A Japanese epidemiological study revealed that alcohol intake is related to blood pressure levels, independent of relative weight, serum lipid levels, smoking rate, uric acid and hemoglobin concentrations (Ueshima, et al, 1984). Alcohol may account for a higher level of blood pressure and a higher prevalence of hypertension in men than women (Ueshima and Asakura, 1984). The people who are living in the northeastern part of Japan where the consumption of sake is high, also have a high consumption of salt (Ueshima et al, 1981).

Alcohol intake may play a role in increasing blood pressure levels and precipitate stroke, although it is possible that other confounding factors related to alcohol drinking may be related to blood pressure and stroke.

I suggest that increased cardiovascular risk factors we can get occasionally in ex-drinkers may create a false impression of a preventive effect of any versus no daily drinking in relation to general and cardiovascular health.

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- 국문초록 -

주요개념 : 음주량, 음주기간, 알콜종류, 심혈관계 위험요인, 한국의 중년기 남성

한국 중년기 남성의 심혈관계 질환 위험요인과 음주섭취와의 관련성

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음주습관과 심혈관계 질환 위험요인사이의 관련성을 파악하기 위하여, 1996년 한국 경북에 있는 도시 지역 한 철강회사에서 40-50대(40-59세) 남자 근로자 3444명으로 부터 공복시 혈액을 10ml 채취하여 혈청지질, 혈당, Uric acid를 측정하고 신장, 체중, 혈압(10-20분 휴식후 측정)과 EKG를 측정하였다. 과거 병력, 현재 건강상태, 음주량과 기간 및 음주종류를 포함한 생활습관, 흡연량/일, 운동시간/주 등의 설문지를 작성하였다. 알콜 소비량은 양-빈도의 index에 의해 측정되었다.

한국 중년기 남자에 대한 음주량, 음주기간, 알콜종류 등에 따른 심혈관계 질환의 위험요인 유무 정도를 알아보기 위해, 비음주자를 기준으로하여 비교대상군은 금주자와 음주량(2군) 등에 의해 3군으로 분류하였으며, 음주기간에 따른 심혈관계 질환의 위험요인 유무 정도를 알아보기 위해 비음주자를 기준으로하여 비교대상군은 금주자와 음주기간(4군)에 따라 5군으로 분류하였다. 알콜종류에 따른 심혈관계 질환의 위험요

인 유무 정도를 알아보기 위해 비음주자를 기준으로하여 비교대상군은 금주자와 음주알콜종류(3군)에 따라 4군으로 분류하였다. 심혈관계 질환 위험요인은 기준 되는 범주를 2개(Table 1)로 분류하여 2*2표를 이용하여 odds ratio(dummy variable로 처리), β -coefficient와 표준오차를 이용해서 신뢰구간(95% C.I.)을 구하여 유의성 검정을 하였다. 금주자의 정의는 과거 3달 이상 술을 마시지 않는 사람을 말한다.

연구 집단의 평균 연령은 44.4 ± 3.9 세이며, 비음주자는 649명으로 18.9%, 금주자는 70명(2.0%)이며 음주자는 2725명(79.1%)이다. 음주자중 에탄올 섭취를 평균 100.5g/주(median) 미만인 군은 1239명으로 연구집단 3444명중 35.7%이며, 평균 100.5g/주(median) 이상 음주군은 1276명으로 44.5%이었다. 3444명중 1532명(44.5%) 이 맥주와 소주를 섞어서 마시는 사람이었다.

음주 양에서, 연령, 흡연 양, 흡연 기간, 운동, 음주 기간, 알콜종류 등을 통제하여 logistic regression한 결과, 비음주자에 비해 중정도 음주자(≥ 100.5 gm/week ethanol)의 확장기 혈압의 Odds ratio는 1.33배로 유의하게 높았다($P < 0.05$). 다른 요인들은 통계적으로 유의한 차이를 보이지 않았다.

알콜종류에서도 연령, 흡연 양, 흡연 기간, 운동, 음주양, 음주기간, 등을 통제한, 비음주자에 비해 맥주와 소주를 섞어 마시는 음주자의 확장기 혈압의 Odds ratio는 1.38배로 유의하게 높았다($P < 0.01$). 다른 요인들은 통계적으로 유의한 차이를 보이지 않았다.

반면에 음주 습관 중 음주기간에서는 연령, 흡연 양, 흡연 기간, 운동, 음주양, 알콜종류 등을 통제한 logistic regression 분석 결과 유의한 차이를 보인 것은 없었다. 그러나 음주기간과 심혈관계 질환 위험요인중 수축기와 확장기 혈압과의 관계는 J 모양을 나타내었다 : 수축기 혈압의 금주자군은 비차비가 1.0보다 약간 낮고(Odds ratio=0.88) 음주기간이 2-10년인 군의 Odds ratio=1.14, 음주기간이 11-20년인 군의 Odds ratio =1.18, 21년 이상인 군의 Odds ratio=1.20로 비음주자의 odds ratio=1에 비해 점차적으로 위험이 높아졌다. 확장기 혈압의 금주자군은 비차비가 1.0보다 약간 낮고(Odds ratio=0.91), 음주기간이 1년 이하인 군의 Odds ratio=1.18, 음주기간이 2-10년인 군의 Odds ratio=1.23, 음주기간이 11-20년인 군의 Odds ratio=1.27, 21년 이상인 군의 Odds ratio=1.27로 비음주자의 odds ratio=1에 비해 점차적으로 위험이 높아졌다.

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