SEPARATE AND COMBINED HARMFUL EFFECTS OF ALCOHOL AND SMOKING ON BOGMA RAKI DRINKERS

Can Boga, Yalçın KEPEKÇİ, Züheyr GÜNAL, Mazen KAWAS

SUMMARY

It is well known that alcohol has a multiple harmful effects on cardiovascular system. The rate of change of several variables with the increase in the rate of drinking has been investigated previously. It would be interesting to investigate whether smoking would affect the rate of change of the same variables.

Bogma Raki is one of the popular drinks in a particular region in Turkey. This drink is different from most other drinks in that it contains on exceptionally high ratio of ethanol (62 %). Studying the harmful effects of this drink on the drinkers with special attention to distinguish smoking and non-smoking drinkers through the different tests and statistics. The test concerned age, body mass index, heart rate, systolic and diastolic blood pressure, and other parameters. This study is the result of two years follow-up period.

INTRODUCTION

Large number of investigations had shown that the mortality of the majority of heavy alcoholics is related to cerebrovascular disease, and had shown good correlaton with high blood pressure (1,2). Alcohol has a harmful effect on cardiovascular system, such as cardiomyopathy and coronery heart disease (3,4,5,6,7). It is still not certain whether giving up drinking would dicrease blood pressure or not. Alcohol drinkers are known to be smokers as well. The prospective research, regarding the effect of smoking on mortality in alcoholics, which has been done up till now is limited (2,8,9).

Bogma Raki is a kind of Turkish regional drink which contains 62 % ethanol. This drink is produced and consumed mostly in the southern part of Turkey (10).

This research has been conducted to (I) establish a relationship between Bogma Raki drinkers, prevelance of hypertension, and electrocardiographic changes (II) detect the level of magnesium in plasma among hypertensive or non-hypertensive alcoholics.

From the Department of Internal Medicine, Gaziantep University Faculty of Medicine, Şahinbey Hospital, GAZİANTEP

This research been completed within two years of follow-up, and is concerned with examining the harmful effect of smoking and Bogma Raki drinking on the cardiovascular system seperate and combined.

METHOD

This research was performed in the south of Adana in Turkey, in Kayisli, Karayusuflu, and Hadirli villages with population of 10.700 persons. 105 persons over 15 years old were regular heavy drinkers of Bogma Raki which contains 62 % ethanol.

According to WHO criteria, there were 36 heavy alcoholics (34.2 %). These alcoholics are used to drink 125-400 ml per day of pure ethanol equivalent for a minimum of five years. Among the 69 cases left, there were 61 cases (58 %) moderate, and 8 cases (0.7 %) mild alcoholic persons (10). 62 persons were chosen as control group through random selection among the people that live in the same region, and of the same age range.

Those persons were asked about their smoking habits, regarding the time of starting the habit and the number of cigarettes smoked per day. Each cigarette contains 1 gr of tobacco. Those persons were divided into three groups regarding their consumption level of tobacco. The first group includes the non-smokers, the second includes the 1-25 gr per day consumers, the third includes the above 25 gr per day consumers.

Systolic blood pressure (SBP) and diastolic blood pressure (DBP) were measured in lying position after 15 minutes of rest period. Body mass index (BMI) was calculated according to the weight and height of the person. Four scales were used to indicate their physical activites:scale 1 refers to inactivity, scale 2 refers to normal activity, and 3-4 refers to heavy physical work (9). Electrocardiographic (ECG) examinations were perfomed in that region. Blood sample were taken in order to measure the levels of magnesium in plasma.

These levels were measured by using Perkin-Elmer 2380 atomic absorbtion spectrophotometer (10). Ethanol levels were measured in Çukurova University, Faculty of Agriculture, Department of Food and Technology laboratories (10).

The same region was visited again one year later, and also, two years later. In these visits, investigations were performed on the stroke and death cases. Coronary death was defined as non-sudden and sudden death death with acute myokard infarct and congestive heart failure which is related to coronary heart disease. That classification was carefully followed in the death diagnosis applied in different hospitals before collecting the data.

Exclusion Criteria. Persons who were found to have gastrointestinal bleeding, anemia, or taking antihypertensive drugs were excluded from the data.

Statistical Analysis. Data was fed to the computer using "LOTUS" program,

and correlations were obtained through plotting the different variables that are expected to show mutual effect.

Student t test was applied in order to examine the level plasma magnesium and p<0.05 was considered significand.

The relative risk were calculated as the odds ratio. In the test, values for relative ٬k are given, rather than the values of odds ratio. The numerical values for both we٬٬ ٬٬٬y imilar. The group consisting of non-alcoholic non-smokers was used as a reference٬ group (٬).

RESULTS

Only males were included in this study regarding alcoholics and non-alcoholics. Among the 27 cases (25.7 %) of alcoholics there were found to have their SBP above 140 mm/Hg; and 24 cases (22.8 %) were found to have their DBP above 95 mm/Hg. Among Bogma Raki drinkers there were 22.8 % of them with hypertension. The range of ethanol consumption in Bogma Raki drinkers was observed to be between 125 and 400 ml per day (average 230+66 ml). The duration of Bogma Raki drinking was found above Five years in 62 % of the cases. SBP percentage distribution in relation to alcoholic degree is shown in Figure I. The SBP values appear to increase steadily with the increase of the alcohol consumption, but this effect seems to be less significant towards the higher levels of consumption. On the other hand, the DBP values appear to have no significant changes in relevance to the degree of alcohol consumption (r=0.9 for SBP and r=0.53 for DBP, p<0.05). Table (1).

Table I: Alcohol Consumption in relation to other factors determined at the screening examination.

	Non-Alcoholic Subject n=62	Mild Alcoholic Subject n=8	Moderate Alcoholic Subject n=61	Heavy Alcoholic Subject n=36	P for Correlation
Mean Age (Yo)	39.6	38.5	43.0	42.4	NS
Mean SBP mm/Hg	126.0	136.0	141.6	140.09	NS
Mean DBP mm/Hg	79.6	85.6	86.9	84.7	NS
Mean BMI Kg/m2	24.5	24.3	24.4	24.5	NS
Mean HR Beat/min	74.0	74.0	73.0	73.5	NS
Phys.Heavy Work Score 3-4 (%)	34.4	62.5	36.6	38.9	NS
Inactivity During Leasure time Score 1-2 (%)	8.2	12.5	13.3	8.3	<0.05

NS: non-significant

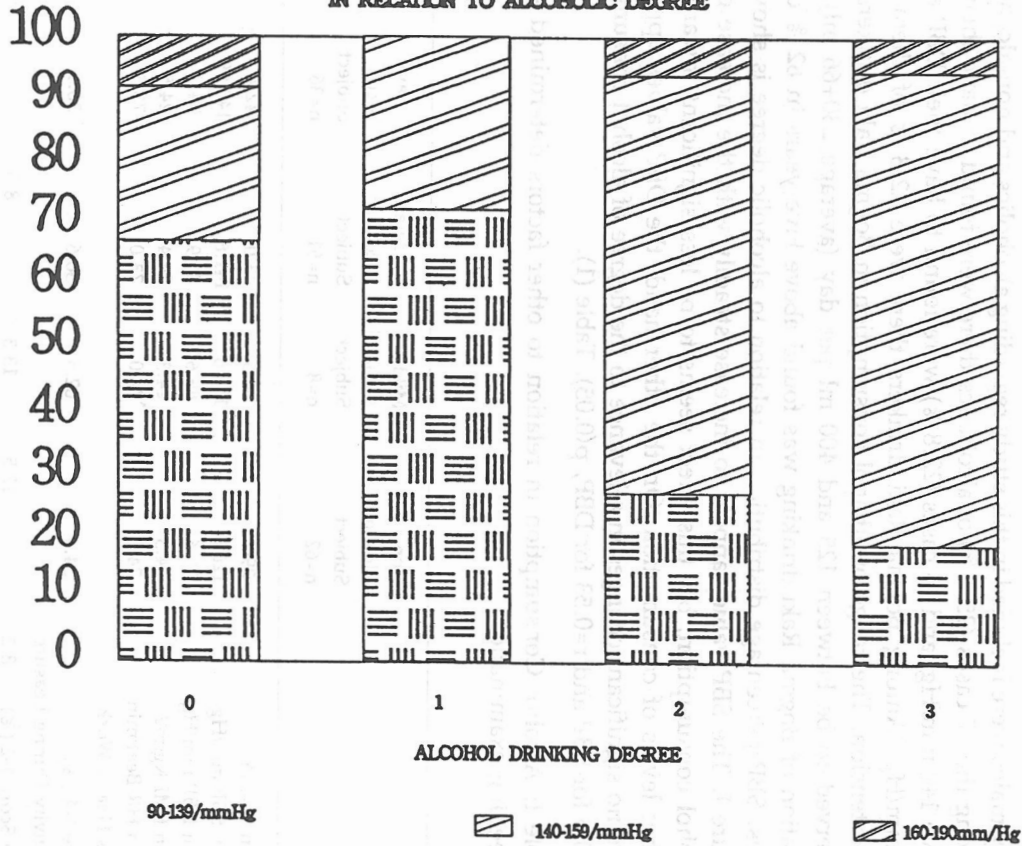# SBP PERCENTAGE DISTRIBUTION

IN RELATION TO ALCOHOLIC DEGREE

DISTRIBUTION PERCENTAGE

ALCOHOL DRINKING DEGREE

90-139/mmHg   140-159/mmHg   160-190mm/Hg
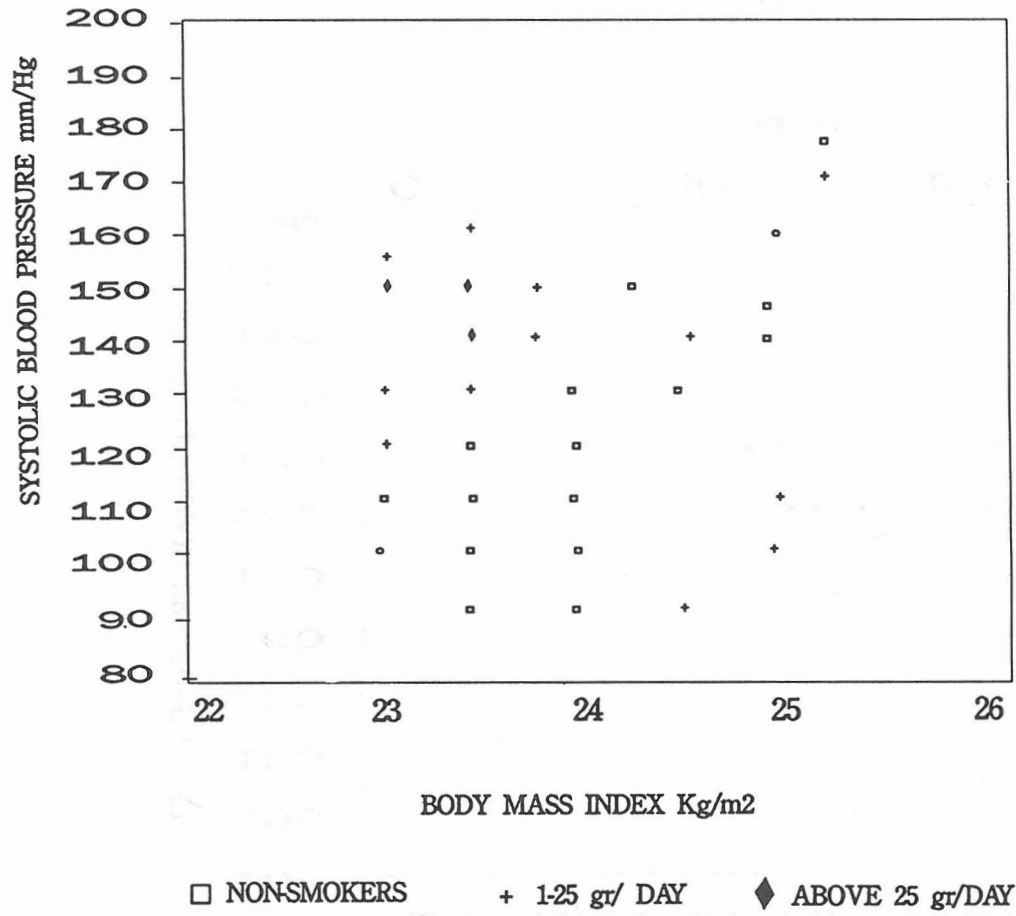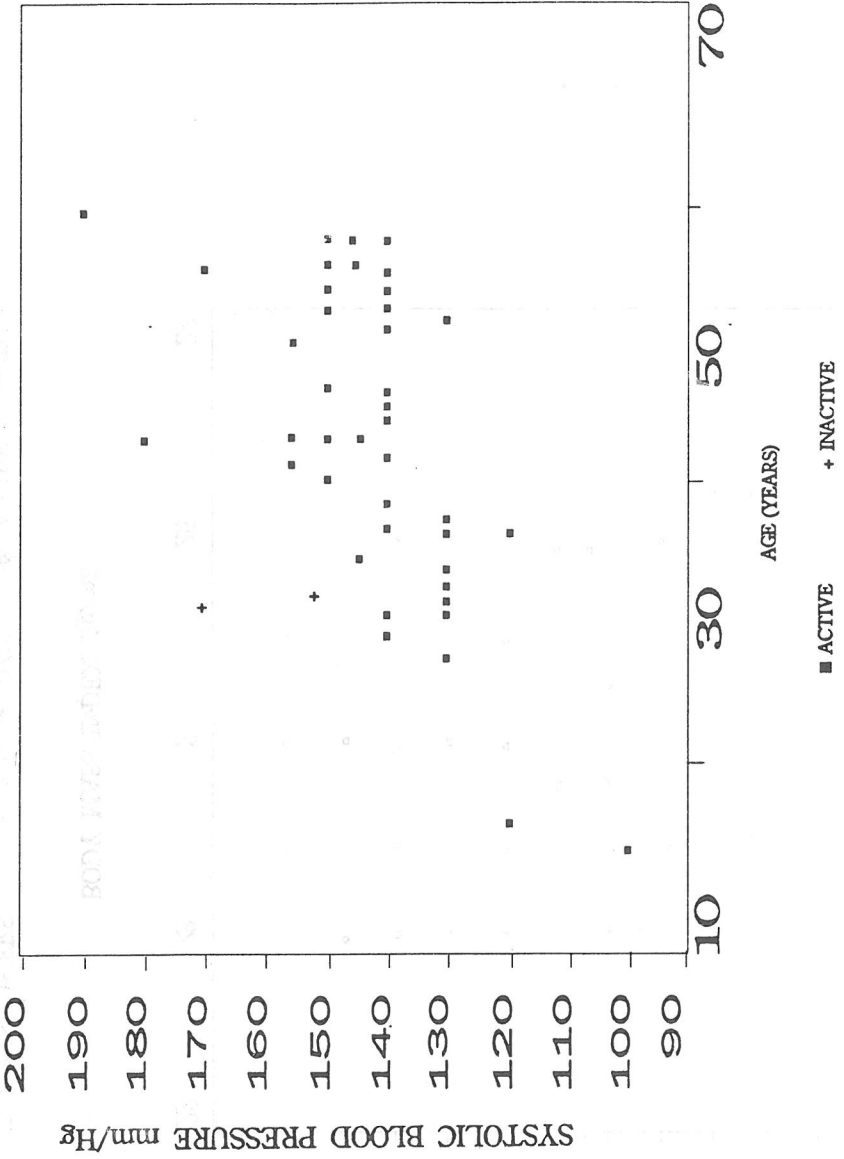
Figure 1

Figure 2

Figure 3

No significant relation appears to exist between age, BMI and heart rate (HR) in chronic Bogma Raki drinkers.

The electrocardiographic records shows PR prolongtion, QTc prolongtion, left ventricular hypertrophy voltage criteria (LVH), premature ventricular beats (PVB), and T wave changes in the Bogma Raki drinkers, when compared with the non-drinkers (p⟨0.05).

No significant difference was observed in the level of plasma magnesium between the hypertensive and non-hypertensive alcoholics. Also, the same was obseved regarding the non-alcoholics (12.8+0.4,n.21;14.4+0.3,n.13; p⟨0.05).

Relationships between smoking and some cardiovascular risk factors are shown in Table II. No significant relationship has been observed between the rate of smoking and body mass index, and also heart rate. However it has may be seen from Figure II. that the mean SBP tends to increase proportionally with the rate of smoking. A relationship appears to exist between heavy alcoholism and heavy physical workers. The incidents that heavy physical workers were heavy drinkers and heavy smokers was observed to be high.

Table II: Smoking in relation to other factors determined at the screening examination.

	Non-Smokers n=46	Smoking 1-24 gr/day n=41	Smoking above 25 gr/day n=16	P for Correl-ation
Mean Age (Yr)	42.2	43.6	39.3	NS
Mean SBP mm/Hg	134.0	138.5	140.3	⟨0.05
Mean BMI Kg/m2	24.5	24.7	24.8	NS
Mean HR Beat/min	73.4	72.4	72.9	NS
Heavy Alcoholics	36.4	30.0	44.4	⟨0.05
Phys.Heavy Work Score 3-4 (%)	35.0	40.0	33.3	NS
Inactivity During Leasure time Score 1-2 (%)	9.1	7.5	22.2	⟨0.05

NS:non-significant.

It has been found that there is a general tendency for the SBP and DBP values to be higher with the increase of age and also the BMI value. In the alcoholic smokers'group, the mean SBP value appears to increase more significantly than that of the non-alcoholic smokers group, and also of the non-smoker alcoholics group (Figure III).

After two years of follow up period, it has been observed that both myocardial infarction and sudden death risks are higher among non-alcoholic smokers than non-smoking Bogma Raki drinkers. Both of these risks, along with the total

mortality risk were found to be even higher among aloholic smokers (Table III).

Table III: Incidence and relative risk of cardiovascular diseases and total mortality during two years follow up period.

	Non-smoking Non-alcoholic Subjects n=51			Smoking Non-alcoholic Subjects n=11			Non-smoking Alcoholic Subjects n=57			Smoking Alcoholic Subjects n=48		
	n	%	RR	n	%	RR	n	%	RR	n	%	RR
Sudden death	1	1.9	1.0	1	9.1	4.8	3	5.2	2.7	5	10.4	5.1
Myocard Infarct	1	1.9	1.0	1	9.1	4.8	1	1.7	0.9	8	16.6	8.7
Stroke	1	1.9	1.0	1	9.1	4.8	3	5.3	2.8	3	6.2	3.3
Total	3	5.7	1.0	3	27.3	4.7	7	12.3	6.4	16	33.3	17.5

RR: relative risk.

DISCUSSION

Earlier researches showed a relationship between drinking and hypertension (1,2,11). In cronic alcoholics, hypertension incidents were. Found to be about 10 % (2). According to one of the studies, high doses of ethanol consumption (80-400 gr/day) may increase the incidence of hypertension to about 25-30(16). Inspite of this, the effect of alcohol is reversible, and in heavy drinkers blood pressure may appear to be low (9,11,13).

The harmful effect of Bogma Raki on cardiovascular system is not well known yet. The rate of consumption of this Raki is high and widely spread in that region of Turkey. Its production is illegal, therefore, there is no governmental health report about it.

In this study, no correlation has been observed between the level of SBP and DBP in relevance to the consumed amount of the 62 % ethanol containing Bogma Raki, which is a product of figs. Hypertension prevelance in Bogma Raki drinkers is found to be similar to the contents of several literatures.

There are many hypothesis about the mechanism of hypertension in alcohol consumers (2,7). Several hypothesis state that alcoholism is likely to lead into hypomagnesimia, but in Bogma Raki drinkers, no significant changes were observed in the levels of plasma magnesium. The reason for that may be explained in that Bogma Raki drinkers were observed to have excess amount of meat in their meals while drinking. Other factors, such as renin angiotensin aldosterone and sympatic tonus were not investigated in this research.

Different studies stated that the incidents of sudden death may increase among alcoholics. One prospective trial performed in Russia, resulted in that sudden

death related to alcoholism was found to be 17 % (2). Still, it is not clear whether the majority of them died from coronary heart disease or not (9). This may be the result of arrythmia or direct myocardial harmful effect of alcohol (3,4,5,14). Cronic alcohol consumption may cause supraventricular arrythmia and other values rythm disturbances (2,10,14,15). Atrial fibrillation is the most common alcohol related arrythmia and it is postulated that in 15-63 % of the fibrillation cases on unknown originated arrythmia plays on important role (2). Although it was too difficult to monitorise in our trial, ECG abnormalities was found to be higher among alcoholics than non-alcoholics. In this aspect, Bogma Raki may be responsible for the undiagnosed sudden death
from coronary heart disease, among alcoholic persons.

In many trials, the effect of smoking was neglected (2,12). It has been observed that heavy drinkers are heavy smokers too. In the present study, no significant difference was observed in the SBP, DBP and alcohol drinking degree, while a signgficant difference was observed in the SBP and the rate of smoking. Similar results were reported by one of the researches in Sweden(16). The relationship between smoking rate and coronary arteriosclerosis is well known (2). This was considered carefully through our studies and observations regarding the mortalities found in Bogma Raki drinkers. Inspite of the high content of ethanol in non-smoking Bogma Raki, it has been observed that the mortality risk among Bogma Raki drinkers is less than the rates found in both alcoholic and non-alcoholic smokers.

CONCLUSION

In the study region, Bogma Raki appears to cause a health hazard on the drinkers. It appears clear too that the mortality rate in smoking drinkers is higher than the non-smoking ones. Therefore, people shold be educated and warned about the harmful effects of smoking, and especially in increasing the harmful effects of drinking.

The content of ethanol in Bogma Raki is higher than any other drink that was investigated in other literatures (4,13,16). For this reason, the researchers in this study were expecting to observe more extreme results than what they found.

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