

Alcohol and the Mediterranean Diet

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Wine drinking held a prominent place in many civilizations. In the Minoan culture in Crete, 35 centuries ago, wine was regularly consumed at meals, never to drunkenness. Crete still enjoys a similar diet and the greatest life expectancy in the Western World. In general, the Mediterranean European Countries (France, Spain, Italy, Greece) have the lowest mortality rate from coronary heart disease among the Western industrialized countries. All these countries consume regularly wine at meals. Thus, a moderate wine drinking does not seem much damaging for health since the mortality from all causes is also among the lowest in the world.

In Eastern France (Nancy), we completed recently a prospective study on 36250 middle-aged men followed for 12 years. 77% of the subjects drank wine and wine represented more than 75% of their alcohol consumption with little differences between social classes. As compared to non drinkers, death of all causes was reduced by 30% for 1 to 4 glasses of wine/day, owing only in part to a reduction in cardiovascular diseases.

In a randomized trial, on 600 patients after a first myocardial infarction, performed in Lyon at the Cardiovascular Hospital, we prescribed a Mediterranean diet including wine to the experimental group. After a mean follow up of 27 months, total mortality was reduced by 70% in the Mediterranean diet group. Cardiac death and all cardiovascular events were also decreased by more than 70%.

That diet is based on a large consumption of bread, legumes, vegetables, fruits, a small amount of meat, cooking with vegetable oil (olive and rapeseed oils) and a reasonable amount of wine at meals. For Mediterranean countries, it is a simple diet, cheap, enjoyable, associated with its well-known conviviality and a great, healthy life expectancy.

Wine Consumption and Stroke (Brain Attack)

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The results of numerous epidemiology studies can be summarized as follows: the risk of haemorrhagic stroke (cerebral haemorrhage) increases at least linearly (possibly exponentially) with average alcohol consumption, independently from alcohol-induced hypertension. The relation with ischaemic stroke (cerebral infarction) is more complex: mild to moderate consumption is associated with a definite risk reduction but heavy consumption is, depending on the studies, either associated with no change or with an increased risk (quadratic effect). This is different from myocardial infarction studies in which the risk reduction is proportional to the daily amount ingested, including at levels qualifying for chronic alcoholism.

A tentative explanation of this J-shaped curve describing the relationship between alcohol consumption and stroke is that mild-moderate consumption decreases the risk of cerebral infarction without increasing much the risk of cerebral haemorrhage, while in heavy drinkers the alcohol-induced haemorrhages outnumber the ischaemic strokes prevented (or even cumulate with an increase in ischemic strokes). In other words the balance is positive for mild to moderate drinkers and becomes negative at a level of consumption above which the total number of strokes increases. What is not precisely known are 1) *the optimal level of consumption* at which the net risk reduction is maximum («healthy drinking»), which is estimated between 1 and 4 glasses a day depending on the studies, and 2) *the point of equilibrium* above which the risk increases (limit of «safe drinking»), which could be between 3 and 6 glasses a day. At the moment it is difficult to make general recommendations about what exactly are «healthy» and «safe» drinking. In adults and elderly people the recently revised UK official recommendations, i.e. an average of 4 glasses a day in men and 3 glasses a day in women, seem to fit the available evidence. However new analytical epidemiology studies of prospective cohorts, including more women (at higher risk of intra-cranial haemorrhages) and younger age groups (who may have a different response), are necessary to address that question more generally.

Alcohol - the biological pathways

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Moderate alcohol consumption is associated with a reduced risk of coronary heart disease. Alcohol may exert protection through its effects on the metabolism of lipoproteins and through its effects on fibrinolysis. We investigated the effects of moderate alcohol consumption on lipoprotein composition and parameters of reverse cholesterol transport as well as several fibrinolytic parameters in eight healthy middle-aged men.

Moderate wine consumption with dinner induces transfer reactions of cholesteryl esters and triglycerides between lipoproteins. These changes are consistent with an HDL-mediated reverse cholesterol transport.

The consumption of alcoholic beverages at dinner affected plasminogen activator inhibitor activity, plasminogen activator antigen level, and tissue type plasminogen activator activity temporarily. These changes in the fibrinolytic system may reduce the risk for thrombus formation by increasing clot dissolving capacity early in the morning which is a time of the day that a large portion of heart attacks normally take place.

Wine, Beer or Spirits?

Results from the Copenhagen City Heart Study

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A large number of epidemiological studies from many countries have described the relation between alcohol intake and mortality from all causes as U-shaped. Most researchers attribute the »U« to a combination of beneficial and harmful effects of ethanol itself. Others still explain the shape of the curve as an artefact due to misclassification or confounding. Until recently, most studies addressed the effect of all the three beverages taken together as »alcohol«.

Three studies of the correlation between wine intake per capita in different countries and incidence of ischemic heart disease gave rise to a hypothesis of a more beneficial effect of wine than of beer and spirits. St. Leger et al., Renaud et al. and later Criqui et al. found an inverse relation between incidence rates of ischemic heart disease and wine consumption in different countries, but no such relation for the other types of beverages.

From the large Kaiser-Permanente study, Klatsky et al. recently reported a trend towards a lower mortality among those who preferred wine, than among those who preferred spirits or beer. In a recent study from Copenhagen, we also suggest that the U-shape reflects different effects of different types of alcoholic beverages. We found that daily drinkers of wine had half the risk of dying as compared to those who never drank wine, while drinkers of beer and spirits experienced no such advantages.

Our results are supported by experimental and clinical studies. Hertog et al. found a beneficial effect of the dietary flavonoids, which are present in wine, but not in beer or spirits, on risk of coronary heart disease. Further, Frankel et al. showed that the phenolic substances in red wine inhibit the oxidation of low density lipoprotein, and maybe thereby lowers the risk of coronary heart disease.

In a review of some of the ecologic, case-control and prospective population studies on the relation between intake of beer, wine and spirits and cardiovascular mortality, Rimm et al. conclude that ethanol itself has the cardioprotective properties. Unfortunately, several of the prospective studies included in the review did not analyse the effect of all three types of alcoholic beverages because of negligible consumption of one or two of them. It is likely that there is a common effect on ethanol on the reduction of risk of developing coronary heart disease, but as mentioned above recent and prospective cohort studies as well as pertinent clinical studies suggest a stronger beneficial effect of wine.

Before these findings should have implications for public health recommendations with regard to drinking different types of alcoholic beverages, several issues are to be considered.

First of all, it is likely that only certain groups of the population experience a preventive effect of intake of ethanol (wine). Secondly, before recommending dramatic changes in public health advice the consequences of changing alcohol intake should be examined. This is of importance, since no studies have shown what happens to abstainers who start to drink. Will these individuals experience the same lower mortality as those who already drank lightly or will they, due to other differences between the different drinking groups, stay at higher risk? Thirdly, the few prospective studies should be replicated in other cohorts before the beneficial effect of wine on mortality should be followed by changes in health promotion.

Wine, beer, spirits - or alcohol?

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Objectives: To review the effect of specific types of alcoholic drink on coronary risk.

Design: Systematic review of ecological, case-control, and cohort studies which specific associations were available for consumption of beer, wine, and spirits and risk of coronary heart disease.

Subjects: 12 ecological, three case-control, and 10 separate prospective cohort studies.

Main outcome measures: Alcohol consumption and relative risk of morbidity and mortality from coronary heart disease.

Results: Most ecological studies suggested that wine was more effective in reducing risk of mortality from heart disease than beer or spirits. Taken together, the three case-control studies did not suggest that one type of drink was more cardioprotective than the others. Of the 10 prospective cohort studies, four found a significant inverse association between risk of heart disease and moderate wine drinking, four found such an association for beer, and four for spirits.

Conclusions: Results from observational studies, where alcohol consumption can be linked directly to an individual's risk of coronary heart disease, provide strong evidence that all alcoholic drinks are linked with lower risk. Thus, a substantial portion of the benefit is from alcohol rather than other components of each type of drink.

What about the Confounders?

Examples from the »Study of Men Born in 1913«

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The »Study of Men Born in 1913« is a prospective cohort study of initially 50-year-old men first examined in 1963. These men have been followed up until 1993. Data from the re-examination in 1973 (60 years old men) and 15 years follow-up data are presented.

Definition: A confounder is a factor or attribute which is related both to a risk factor (or causative factor) and the disease being studied. In this study the concept of confounding will be exemplified by the correlation between alcohol consumption and risk factors for myocardial infarction (MI) and death from coronary heart disease (CHD).

Methods: 787 men (83% of the random sample) were examined in 1973. A complete history of alcohol consumption was obtained and traditional risk factors were measured.

Results: 39 of the 787 men had a prior MI and have been excluded from the prospective analyses. During 15 years of follow-up 143 men developed MI or died from CHD.

- A. Alcohol consumption from beer, wine and liquor as well as total alcohol consumption were not related to the risk of MI+CHD. There was, however, a significantly lower incidence of MI+CHD (13%) among those who drank wine once/week compared to those who drank more often (19%) and those who drank 1-2 times/month (15%) or seldom/never (22%). Similar, but non-significant trends for frequency of consumption were noted for beer and liquor.
- B. Other risk factors for MI+CHD in this study were smoking, diabetes, increased blood pressure, increased serum cholesterol and triglycerides, increased body mass index and waist circumference (abdominal obesity). There was a tendency to a lower incidence of MI+CHD among men in social class I (14%) compared to social class II (20%) and III (18%).
- C. These risk factors (B) may be possible confounders of the relation between moderate (once per week) wine consumption and the decreased risk of MI+CHD. Thus, smoking was least common among moderate wine consumers (39%) and most common among those drinking wine more often (62%). There were 46% smokers among those drinking wine 1-2 times/month and 42% among those who seldom/never drank wine. Among social classes wine drinking was most common in social class I (71%), decreasing to 48% and 33% in social classes II and III. Wine drinking among diabetics did not differ from non-diabetics. Those drinking wine twice/week or more had the lowest blood pressure, body mass index, waist circumference and serum cholesterol while those drinking wine seldom/never had the highest levels of these risk factors.

Conclusion: The relation between moderate wine consumption and a decreased risk of MI+CHD may partly be explained by the confounding factor »low prevalence of smoking« and the increased risk among those who drank seldom/never by the other traditional risk factors.

Danish Drinking Habits

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Since 1988 the author have participated as project leader or co-leader in alcohol research using survey or qualitative interview methodology. The paper represents results which have been obtained in two major surveys comprising respectively one hundred and fifty questions on alcohol consumption, attitudes towards alcohol and alcohol policy and from three surveys dealing with the Danes' behaviour during »the crisis« in which a few questions on alcohol consumption and -attitudes were included. The research has been coordinated within a »frame of understanding« established by the author using a general social psychological approach and introducing the concept of »*alcohol consumer consciousness*«. The alcohol profile established through this research is one of a population with liberal attitudes towards consumption in general, but with a support of a selective restrictiveness. It is a population experiencing alcohol as a good in life, knowing the risks, however. It is also a population of which alcohol consumption is closely related to socioeconomic status (high positions have greatest average consumption), and with a traditional man-woman ratio. The Danes start using alcohol fairly early and consume their alcohol in a pattern determined by age. There is a clear day and week pattern and the consumption of alcohol has over the years become a »home and near-group« activity. The results indicate that three groups ought to be given special interest: The young, women and high consumers. It is an assumption in the project that the alcohol consumer consciousness can be defined in terms of *passive*, *adaptive* and *active* and results seem to indicate that a majority of the population functions on the levels of »passive« and »adaptive« and not on the (ideal) level of »active« with its reflected action in the situation and anticipating processing of future situations.

Norwegian drinking habits

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Based on official statistics and survey data a picture of Norwegian drinking habits will be presented. There will be given estimates on the total consumption, both recorded and unrecorded, and how it is distributed in the population. Also some data on the drinking contexts and on problematic drinking will be presented, and the question of whether there exist any typical »Norwegian drinking habits« will be discussed.

Swedish drinking habits

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In my presentation I will give a short survey of Swedish drinking patterns and variations in consumption manners from 1850 to 1990. My aim is to elucidate how restrictive alcohol policies have affected and changed popular drinking habits. In my recent research I have mostly studied drinking habits from a cultural perspective which partly gives a new picture of how and in which directions restrictive measures can affect popular drinking. In Sweden both the Gothenburgh system and the Bratt system meant an almost unbelievable reduction of popular restaurants. This extinction of taverns had some negative consequences on social drinking as the home, the street and the blind pig became new areas for drinking and abuse. Severe restrictions and prohibition in rural regions and counties also led to undesired and dangerous consumption of ether, arcane and false wines which at times created immense social problems, especially in the less dense populated northern parts of the country where Temperance had its strongholds. The Bratt system, introduced roughly at the same time as the Danish system but clearly different in measures, opened the way for a more centralized policy. However the custodians of the system admitted local system companies to elaborate their own policies provided that they stretched the letters of the law to the utmost thereby creating possibilities for the establishment of distinctly different drinking patterns in the various parts of the country. This development was also due to the political and organisational strength of Temperance in the counties. The era of diversity was broken with the elimination of the restrictive system in 1955 and after that year the figures for total consumption per inhabitant are almost uniform for the whole country and in the 1990's many of the former dry areas have surpassed the wet districts.

Danish Alcohol Policy

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In Denmark marketing, purchase and consumption of alcohol only is lightly restricted. The alcoholic industries and the »Forbrugerombudsmanden« have agreed on restrictions in marketing and advertising, mainly on not targeting youngsters, not chaining health issues positively with the consumption and to some extent join in on the task of prevention.

It's legal for everybody to obtain alcoholic products (defined as 2.5% vol and more) in the shops during the limited opening hours, thus in municipalities with status of a holiday resort, the opening hours are less limited, including sales on Sundays. Legally you can be served alcoholic beverages at restaurants and bars from the age of 18 - if, in addition, you are not too drunk.

In general, it's legal to consume alcoholic beverages almost everywhere, though various local laws and rules enforced by e.g. the municipality, the workplace or the police, can forbid or restrict consumption. It's legal to drive with a BAC up to 0.8, if you're still »sober«. Special rules are enforced mainly in the aviation business.

In the first two decades of the 19th century the total consumption of alcohol (and death caused by alcohol) declined, most heavily in 1917 where the retail price rose due to an approx. 1,000 percent increase in taxation. Though taxation and price proved to be a potential prevention instrument it has not lately been used in the effort to prevent damages, on the contrary, the taxation has been levelled to EU-provenue (latest in 91, 92 and 96) in order to minimize the bordertrade or make equal conditions of sales for various types of alcoholic beverages.

Only using the instruments as mentioned above, it has been Danish policy to minimize damages from alcohol by putting forward educational programs, information efforts and secure treatment, especially targeting the people in need. Though, during the last 10 years the Danish alcohol policy has undergone changes and the question of alcohol prevention and treatment have been given a higher priority. Due to the »Governmental Prevention Programme« (1989), »Law on alcohol prevention and Care« (1994) and »Law on Healthplanning in Counties and Municipalities« (1994) - and other regulations at national as well as local level - more resources and efforts has been put forward in the field of prevention and treatment. All together approx. 120 mio. Danish kroner are spent each year on special treatment (not including GP's, somatic and psychiatric hospitals) and prevention of alcohol problems. Denmark has joined the WHO European actions on alcohol. Since 1983 the total consumption of pure alcohol per capita above 14 years of age has declined with about 0.5 litres - in 1995 the Danes drank 12.1 litres.

Norwegian alcohol policy

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A brief outline of the present alcohol policy in Norway will be given, along with its historical roots. Also some possible future changes, and the reasons and motivations for these changes, will be discussed.

Swedish Alcohol Policy

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The Swedish parliament has defined the aim of Swedish alcohol policy as being to reduce total consumption of alcohol by at least 25 per cent between 1980 and 2000. Considering that registered sales of alcohol fell by only six per cent between 1980 and 1994, the achievement of a 25 per cent reduction by the turn of the century seems an unrealistic target, especially now that the instrument of alcohol policy are being weakened. Enabling the level of alcohol consumption to remain unaltered for the next few years is the more realistic aim formulated in the National Plan of Action for prevention of alcohol related harm and drug prevention. To this objective the following sub-objectives have been added: Moderate drinking habits, Alcohol-free childhood and adolescence and Abstinence in certain situations such as: during pregnancy, on the roads, at work and at sea. The strategy which Sweden has adopted for reducing total consumption is a combination of measures for reducing the availability of alcohol and measures limiting demand. The most important way of limiting total alcohol consumption is by reducing the availability of alcohol while at the same time trying to influence drinking habits through information, education, opinion formation and caring measures. Fundamental to Swedish alcohol policy, then, is a close interaction between preventive measures, control policy and treatment of alcohol abusers.

Swedish alcohol policy is based on measures addressed to the entire population. In addition, important supplementary measures are addressed to groups specially at risk, above all juveniles, children of alcohol abusers and various groups with high levels of alcohol consumption.