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Beverage Preference and Diet by Erik Skovenborg

The problem of trait differences between users of different beverage types is arguably the single most important consideration in attempting to explain possible beverage type differences in coronary heart disease risk (1). Klatsky et al were among the first to describe the traits of persons who choose wine, liquor or beer (2). Persons who preferred wine were likely to be women, temperate, young or middle-aged, non-smokers, better educated and free of symptoms or risk of illness. Persons who preferred liquor were likely to be men, heavier drinkers, middle-aged and older, less educated and afflicted with symptoms or risk factors for major illnesses. Persons who preferred beer were likely to be young men, who were intermediate between wine and liquor preferers for most traits.

Italian wine drinkers

The authors believed that their findings in California were substantially applicable to other regions of the U.S., however, the interest in good health practices in the entire nation might have found disproportionately strong expression among Californians who choose wine. The traits of persons who choose wine might well be different in other nations; the beverage preferences of excessive drinkers generally reflect the prevailing drinking habits in their socio-cultural milieu (3). In Italy higher risks of esophageal cancer were observed for wine-only drinkers, and after allowance for wine intake, no association was observed between beer and spirit drinking and esophageal cancer in a population in which 80% of alcohol came from wine (4). And in no instance did wine drinkers or mixed drinkers, who include a large proportion of wine drinkers, show an association with indicators of healthy diet in a cross-sectional analysis of the relation between wine drinking and intake of selected foods (5).

Mediterranean diet

In the Copenhagen City Heart Study the participants who had a daily intake of 3-5 glasses of wine had a 50% lower risk of dying from all causes compared to non-drinkers of wine, while beer and spirits drinking had a much smaller beneficial effect (6). No significant interactions existed with sex, age, education, income, smoking, or body mass index. During the years prior to the study period Danish drinking patterns had changed dramatically in favour of wine drinking. In 1975 wine contributed to 17.3% of the total alcohol intake, rising to 30.2% in 1992. The change from beer to wine was inspired by the increasingly popular holiday travels to Mediterranean countries. Now could it be that same Copenhagen citizens that so warmly embraced the Mediterranean wine would also be inclined to embrace the Mediterranean diet? An intriguing question of potential confounding no doubt, but a question not possible to answer back in 1995; The Copenhagen City Heart Study had no data on diet.

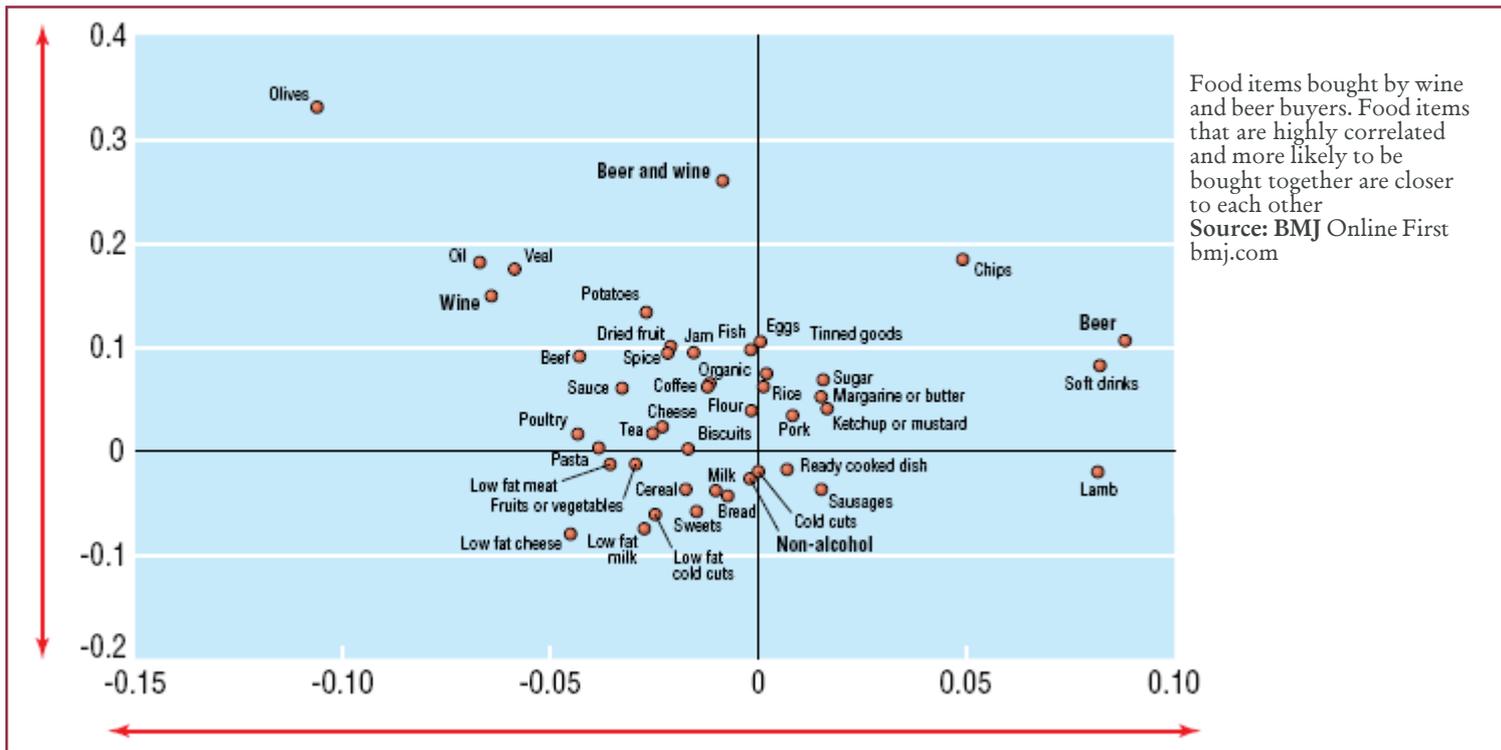
Four years later results from the Danish Diet, Cancer and Health Study confirmed the Mediterranean diet perspective; wine was associated with a higher intake of fruit, fish, cooked vegetables, salad, and the use of olive oil for cooking in both men and women (7). The healthy dietary habits seemed independent of educational status. A few years later similar results were reported from the cross-sectional UNC Alumni Heart Study: wine drinkers reported eating more servings of fruit and vegetables and fewer servings of red or fried meats (8).

Confounding or measurement error

Accordingly, we have to respect dietary habits as important potential confounders of alcohol-health relations, but one problem that we seem to have neglected over the years is measurement error. If humans represent the most intelligent form of life on this planet, why is it that they find it so difficult to accurately record the food items they consume daily? People misjudge their diet. They tend to overreport "good" foods and are often in denial of their dietary "sins" (9). Self-report of dietary intake may be biased by social desirability, and given the social and psychological value ascribed to diet the reporting of food intake is particularly vulnerable to response set bias. There is need to sharpen tools like the food frequency questionnaire (FFQ); if nutritional epidemiologists neglect to do so they will increasingly produce inconsistent results and loose credibility in the scientific community.

Marine n-3 polyunsaturated fatty acids in fish and fat

Danish scientists studying the association of Heart Rate Variability (HRV) with fish and wine intake found a clever way to verify information of fish intake (10). Fish consumption was positively associated with the level of marine n-3



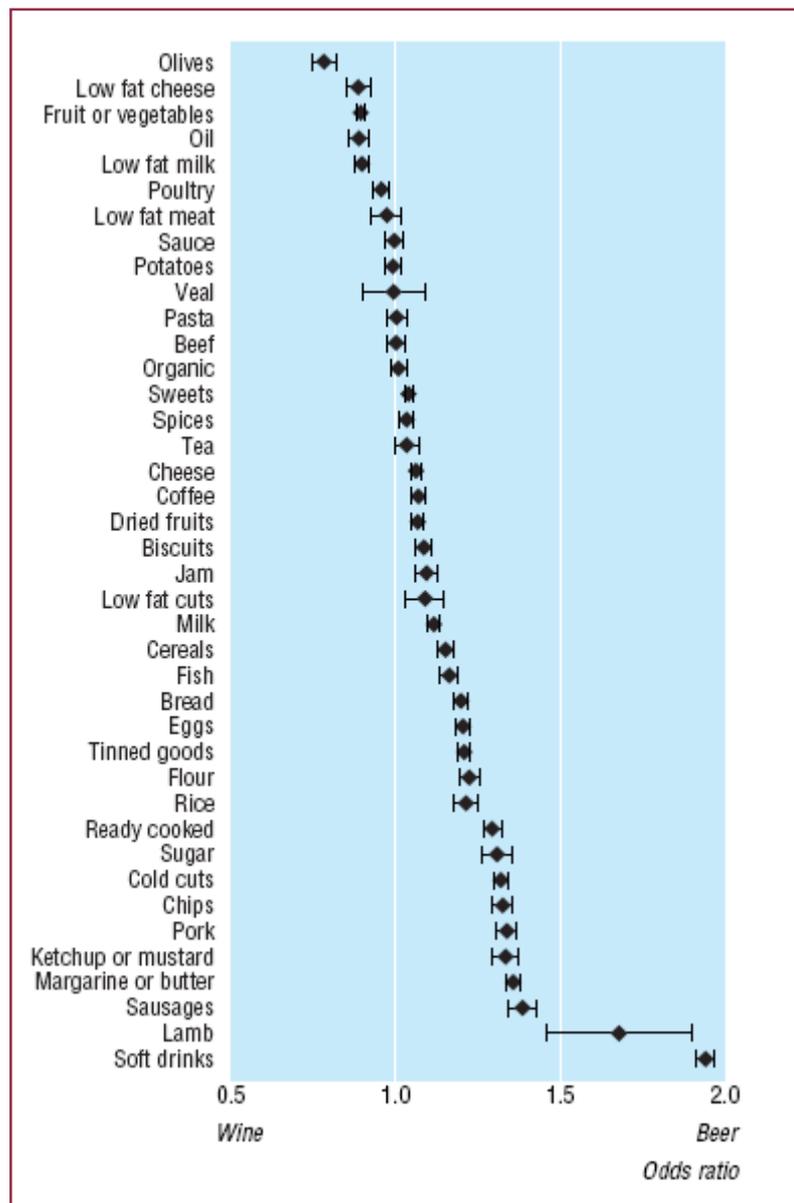
polyunsaturated fatty acids in human adipose tissue and with HRV. Wine intake was also significantly positively related to HRV, but the patients with the highest wine intake also had the highest intake of fish as documented by a high n-3 polyunsaturated fatty acid content in adipose tissue – no questions asked! The correlation between wine intake and HRV was no longer significant after controlling for the cellular level of n-3 polyunsaturated fatty acids.

Till receipts reveal eating habits

Another alternative to asking people what they eat is to find out what they buy. To study whether people who buy wine also buy healthier food items and therefore have a healthier diet than those who buy beer Johansen et al investigated the relation between the purchase of beer and wine and various food items using data taken from 3.5 million transactions chosen at random from 98 outlets of two large Danish supermarket chains over a period of six months (11). Wine buyers bought more olives, fruit and vegetables, poultry, cooking oil, and low fat cheese, milk and meat than beer buyers. Beer buyers bought more ready cooked dishes, sugar, cold cuts, chips, pork, butter or margarine, sausages, lamb, and soft drinks than wine buyers. In conclusion wine buyers were more likely to buy Mediterranean food items than beer buyers.

The real confounder: diet or wine?

Is the effect of wine on health fatally confounded by diet? Grønbaek and Sørensen have quantitatively assessed in a theoretical sensitivity analysis whether diet is a plausible confounder of the relation between wine intake and mortality by applying the method to previously reported data from the Copenhagen City Heart Study (12). 1 In the present analysis, the unadjusted odds ratio



for the 50 deaths among the 257 exposed (i.e., those who had a daily intake of wine) and the 780 deaths among the 2,553 unexposed (non-wine drinkers) was estimated as 0.6. The odds ratios for the relation between wine intake and mortality, adjusted for a hypothetical confounder, have been calculated for various scenarios. It appears that even a very strong confounder (odds ratio = 0.3 or 0.1) would have to exhibit a very uneven distribution among wine drinkers and non-wine drinkers to fully explain the findings. It seems very unlikely that the previously reported lower mortality among wine drinkers compared to non-wine drinkers can be explained fully by dietary factors. The Mediterranean diet has in six out of 10 cohort studies been found to have a weak protective effect on coronary heart disease (13). However, the dietary studies were not controlled for wine intake, therefore the question still remains: which factor is the real confounder, diet or wine?

Enjoy in moderation

Because food and wine provide some of life's most accessible and potent forms of pleasure, perhaps we should accept that we are dealing with behaviour governed by hedonism rather than by rationality (14). We will leave the difficult task of sorting out cause and effect to the epidemiologists. In the meantime, enjoy – though in moderation. It's the smart thing to do – whether you prefer a dry Martini, a bottle of beer or a glass of wine.

Erik Skovenborg is a General Practitioner, a founder member of the Scandinavian Medical Alcohol Board (SMAB), and a valued member of the AIM Medical Council. He was a contributing author to the BMJ study (2006;332:519-22) which analysed the food buying habits of wine and beer drinkers).

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