AIM Alcohol in Moderation

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Why the Pattern of Drinking Matters

Emerging Research on Alcohol, Drinking Patterns, Diet Quality and Health by Elisabeth Holmgren

Research, medical and policy experts alike have emphasised that moderation and sensible behaviour is the only responsible choice for those who choose to enjoy wine, beer and spirits. Over the last few years, emerging scientific studies have continually revealed that the moderate pattern of drinking as part of a well balanced diet can have positive lifestyle effects. In fact, a recent US government study on alcohol, drinking patterns and diet quality found that "healthier diets were associated with healthier drinking patterns." The authors examined associations between alcohol and diet quality (Healthy Eating Index (HEI) scores) using cross-sectional, nationally representative data from the 1999–2000 National Health and Nutrition Examination Survey. Weighted analyses included 3,729 participants aged >20 years. In adjusted analyses among current alcohol drinkers, as quantity increased from 1 to 3 drinks/drinking day, the mean HEI score decreased from 65.3 to 61.9. Specifically, the study reported that those who drank the most alcohol had the poorest diets, while those who drank the least had the best diets. **1**

This article will outline some of the prominent medical research findings which underscore the importance of following sensible drinking patterns and enjoying alcohol in moderation as part of a healthy diet and lifestyle.

Moderate and Light Drinking Patterns Found Most Beneficial

Moderate drinkers were found to be in overall better health according to a study conducted by Oregon Health and Science University. The researchers surveyed several thousand men and women members of Kaiser Permanente Northwest and concluded, *"For both genders, light to moderate consumption and more frequent drinking were associated with better health and functioning; relationships were stronger among women than men."* The study cautioned, however, that individuals and specifically women who drank heavily were in worse health. Furthermore, the investigators suggested that they did not believe that better health is a result of moderate drinking but that it has been reported that moderate drinkers also tend to lead healthier and more balanced lifestyles. Moderate drinking was defined as one to two drinks per occasion, two or three times a week, or 15 to 29 drinks spread out throughout the month**. 2**

Stable patterns of light drinking contributed to the lowest all-cause mortality rate according to a Dutch study which analysed whether changes in individual alcohol intake contribute to corresponding changes in mortality. Stable drinkers showed U-shaped all-cause mortality; teetotalers who became light drinkers decreased their risk of dying from heart disease while light drinkers who stopped drinking saw a slight increase in heart disease related problems. Cancer mortality was increased in all heavy drinking groups. Non drinkers were defined as less than once a week, and light drinkers, between 1 and 6 drinks a week. The study also defined moderate drinkers as those who had up to 13 drinks a week and heavy drinkers beyond that. The investigators concluded, *"Persons with stable patterns of light and moderate alcohol intake had the lowest all-cause mortality. Individual changes in alcohol intake were followed by corresponding changes to mortality"* **3**

Another Danish population-based cohort study obtained risk estimates for all-cause mortality for different quantity and frequency of alcohol intake adjusted for various lifestyle factors, including diet. During the follow up, for the same average consumption of alcohol, a less-frequent intake related to a higher risk of death than a more frequent pattern. The researchers wrote, *"Drinking pattern and not just the total amount of alcohol consumed is important for the association between alcohol intake and mortality."* **4**

Life expectancy benefits were observed among moderate drinkers in a UK study which estimated the deaths and person-years of life lost to age 65 that were attributable to various consumption levels. These included any drinking, drinking within limits, or drinking more than the British Royal Colleges' limits. The latter are 21 units (8g) per week for men and 14 units per week for women. Most interestingly, deaths attributable to alcohol outweighed those prevented by use for men up to age 54 and for women up to age 64. Among men, those aged 16–24 years, and among women, those ages 35-44 years, were at greatest risk of alcohol-related mortality. Men above 75 and women above 85 and older were most likely to benefit. However, the researchers conclude, *"Although overall mortality risks and benefits of alcohol consumption appear roughly equal, drinking above recommended limits remains responsible for many deaths and a large loss of person-years of life."* **5**

Healthier drinking patterns lead to lower risk for coronary heart disease according to an important review article highlighting that modern epidemiologic studies reveal lower risk of both morbidity and mortality among lighter

drinkers. The author of this US study also explained that *"when defining 'heavy' as greater than or equal to 3 standard drinks per day, the alcohol-mortality relationship is a J-curve with risk highest for heavy drinkers, lowest for light drinkers and intermediate for abstainers."* The investigators explained that lighter drinking is unrelated to increased risk of any cardiovascular condition and, in observational studies, is consistently related to lower risk of CHD and ischemic stroke. A protective hypothesis for CHD is robustly supported by evidence for plausible biological mechanisms attributable to ethyl alcohol. **6**

Other more recent studies also found that the protective effect was more a function of frequency of consumption than of volume. In fact, small amounts consumed several times a week reduced risk to a greater extent than the same amount consumed over fewer occasions. **7** Along those lines, a 2004 population-based case control study also focused on the pattern of drinking and myocardial infarction (MI). Participants were selected randomly from two Western New York counties underscored that the results signify that patterns of alcohol use have important cardiovascular health implication, with more frequent consumption giving the greatest protection. **8**

In a population-based study of subjects in northwestern New York, the lifetime *volume* of alcohol intake was not related to the development of metabolic syndrome (MS), but the average *intensity* (average amount/drink) of alcohol intake showed a *positive* relation. Frequency of alcohol consumption was protective against some critical health parameters in that more frequent moderate drinkers of both genders were less likely to have low-HDL-cholesterol and less abdominal obesity in women. The authors explained that *"while lifetime use of alcohol is somewhat difficult to interpret, these data suggest that frequent drinking of small amounts may protect against many components of the metabolic syndrome."* The study also indicated that larger amounts or binge drinking per occasion are harmful. In fact, increasing *intensity* of alcohol use increased the risk of the metabolic syndrome in a step-wise fashion**. 9**

Binge drinking has many negative health outcomes according to research studies from around the world. Three studies brought forward some important aspects with respect to binge drinking and health, further underscoring the results from the above mentioned review study. In fact, a Dutch study suggests that binge drinking disrupts the actions of blood platelets by hindering platelet adhesion to fibrinogen. The researchers concluded specifically, *"Rapid intake of alcohol increases platelet aggregation, which might contribute to the increased mortality associated with binge drinking."* **10**

Another study found that *"subjects reporting binge drinking had an increased risk of dying in comparison with subjects who drank but did not report binging after a myocardial infarction."* This held true whether the subjects binged less than weekly or more than weekly. The definition of binge drinking used here (3+ drinks within 1-2 hours) is different from the usual of 5+ drinks per occasion, but showed similar adverse effects. **11**

The Importance of Overall Healthy Dietary Patterns

Alcohol as part of a healthy diet leads to increased life expectancy in line with several research studies. According to a study published in the *British Medical Journal*, the Mediterranean diet as a well known healthy nutrition concept is associated with longer life expectancy. The major staples of the Mediterranean diet are characterised by a high intake of vegetables, legumes, fruits, and cereals; a moderate to high intake of fish; a low intake of saturated fats, but high intake of unsaturated fats, particularly olive oil; a low intake of dairy products and meat; and a modest intake of alcohol, mostly as wine. Adherence to a Mediterranean style Diet lead to an up to 14%, increase in life expectancy. The authors wrote in the conclusion, *"Adherence to a Mediterranean type diet, which relies on plant foods and unsaturated fats, is associated with a significantly longer life expectancy, and may be particularly appropriate for elderly people, who represent a rapidly increasing group in Europe."* **12**

Dietary patterns and lifestyle factors are associated with mortality from all causes, coronary heart disease, cardiovascular diseases, and cancer, but few studies have investigated these factors in combination. Therefore, the objective of another study was to investigate the single and combined health effect of dietary and lifestyle factors in a European population. Adhering to a Mediterranean diet, moderate alcohol use, physical activity, and non-smoking were associated with a lower risk of all-cause mortality. Similar results were observed for mortality from coronary heart disease, cardiovascular diseases, and cancer. The combination of these four favourable traits lowered the all-cause mortality rate significantly. In total, lack of adherence to this low-risk pattern was associated with a population attributable risk of 60% of all deaths, 64% of deaths from coronary heart disease, 61% from cardiovascular diseases, and 60% from cancer. The researchers concluded, *"Among individuals aged 70 to 90 years, adherence to a Mediterranean diet and healthful lifestyle is associated with a more than 50% lower rate of all-causes and cause-specific mortality."* An accompanying editorial by Harvard University experts also underscored the importance of lifestyle habits in disease prevention and emphasize that dietary factors and physical activity are of major importance. **13**

Along those lines a further study found that the Mediterranean–style diet improved the functioning of endothelial cells and reduced vascular inflammation in patients with metabolic syndrome, a medical condition that can increase the risk of cardiovascular disease and type 2 diabetes. **14**

Healthy lifestyle habits may decrease risk of developing or dying from cancer among post-menopausal women who followed recommended dietary and lifestyle guidelines, with those in highest compliance experiencing the best outcomes. Conversely, those women who followed one or none of the nine recommended guidelines for diet and lifestyle had a 35 percent higher risk of developing cancer and a 42 percent greater risk of dying from cancer than women who adhered to at least six of the recommendations considered for the study. The investigators evaluated women's cancer risk and other health outcomes based on how many of specific healthy lifestyle categories the women followed as part of their normal lifestyle. Those recommendations included having maximum body mass index less than 25 kg/m2; having gained no more than 11 pounds since age 18; engaging in daily moderate and weekly vigorous physical activity; eating of 5 or more servings of vegetables and fruit daily; consuming more than 400 grams (about 14 ounces) of complex carbohydrate per day; *limiting alcohol intake to less than 14 grams per day (one drink)*; limiting red meat consumption to less than 80 grams per day (about 3 ounces); limiting daily consumption of fat to no more than 30 percent of total caloric intake; and limiting use of sodium to less than 2,400 milligrams per day. **15**

Drinking around Mealtime May be Advisable

Other studies from around the world have reported that drinking with meals or around mealtime may enable the alcohol to counter adverse effects of fatty foods during the critical digestive phase. **16, 17, 8**

More recently, Italian investigators studied how the timing of alcohol consumption in relation to meals might affect the risk of myocardial infarction (MI) in an Italian population and concluded, *"Alcohol drinking during meals was inversely related with risk of acute MI, whereas alcohol drinking outside meals only was unrelated to risk."* **18** In a 2003 *Scientific American* article, Dr Klatsky summarized the data on moderation and health and explained that drinking patterns (e.g. imbibe slowly and regularly with food) or other factors (e.g. type of consumer and lifestyle habits such as exercise) all may effect the health outcome of alcohol. **19**

Drinking patterns are important with respect to overall health. It's not just how much you drink but the pattern of drinking and even when you drink that can determine the amount of damage to the liver. The effect is most striking for women, according to a report by researchers at the State University of New York at Buffalo. The study found that a woman drinking alone and not eating on a weekend is more likely to be causing damage to her liver than a woman drinking the same amount while dining with a friend. However, the results are different with men, with the amount and frequency of drinking more important than the pattern of drinking, with or without food. The study results showed that a safe level for men is 14 to 27 drinks a week; while for women it is 7 to 14 drinks a week (14g of alcohol in one typical drink). According to the investigators, the findings reinforce the recommendations for both sexes for moderate and slow drinking over a long period of time, rather than over a short period, such as a weekend. The researchers wrote in the conclusion, *"These findings support the hypothesis that, in addition to amount, drinking pattern may affect liver function and that difference exist between sexes with regard to the effect of drinking pattern on liver function and potential liver damage."* 20

Relationship of alcohol drinking pattern to risk of hypertension was analysed in a sample of white men and women from western New York. Compared with lifetime abstainers, participants reporting drinking on a daily basis or mostly without food exhibited significantly higher risk of hypertension. When the analyses were restricted to current drinkers, participants consuming alcohol without food exhibited a significantly higher risk of hypertension compared with those drinking mostly with food. For major beverage preference, no steady association with hypertension risk was found across the various types of beverages considered which included wine, beer and spirits. Specifically, the investigators summarized, *"In conclusion, drinking outside meals appears to have a significant effect on hypertension risk independent of the amount of alcohol consumed."* **21**

Alcohol consumption with or without meals and reduced acute myocardial infarction (MI) risk has also been reported. Researchers undertook this study to determine whether the apparent favorable effect of alcohol on the risk of acute myocardial infarction (MI) may be related to its hypoinsulinemic effect when consumed with meals. They studied how the timing of alcohol consumption in relation to meals might affect the risk of MI in an Italian population with relatively high regular alcohol consumption. The researchers found that compared to nondrinkers, an inverse trend in risk was observed when alcohol was consumed during meals only. However, no consistent trend in risk was found for subjects drinking outside of meals. They further explained that the pattern of risk was similar when they considered people who drank only wine and concluded, *"Alcohol drinking during meals was inversely related with risk of acute MI, whereas alcohol drinking outside meals only was unrelated to risk."* **22**

The importance of well-balanced and nutritious diets as a potential disease prevention measure has been long acknowledged and featured by leading nutrition and public health experts. **23** These research findings reveal the importance of moderate drinking as an adjunct to healthy meals and a well balanced daily food intake.

Public Health Advice:

Accumulating scientific evidence throughout this past decade suggests that moderate consumption of alcohol beverages does not pose a health risk to the vast majority of healthy individuals around the world who choose to enjoy sensible amounts of spirits, beer and wine. Also, according to the 2005 Dietary *Guidelines for Americans, "The consumption of alcohol can have beneficial or harmful effects depending on the amount consumed, age and other characteristics of the person consuming the alcohol and the specifics of the situation."* **24**

This emerging research underscores the importance of moderate alcohol consumption as part of a healthy diet and lifestyle. Public health guidelines around the world emphasise moderation and clearly condemn irresponsible drinking patterns such as binge drinking and abuse. Many public health messages also reiterate the importance of an overall healthy diet and lifestyle for those who choose to drink without recommending the consumption with meals but rather as an adjunct to it. As the scientific debate will continue, more research findings on drinking patterns may lead to revised basic messages on the lifestyle benefits of enjoying moderate amounts of wine, beer, and spirits as part of a well balanced diet.

References:

1. Breslow RA et al, Alcohol Drinking Patterns and Diet Quality: The 1999–2000 National Health and Nutrition Examination Survey, American Journal of Epidemiology 2006 163(4):359-366; doi:10.1093/aje/kwj050.

2. Green, C et al, Gender Differences in the Relationships between Multiple Measures of Alcohol Consumption and Physical and Mental Health. , Alcoholism: Clinical & Experimental Research. 28(5):754-764, May 2004

3. Grosbeak, M et al, Changes in Alcohol Intake and Mortality: A Longitudinal Population-based Study.

Epidemiology. 15(2):222-228, March 2004.

4. Tolstrup JS et al, Drinking Pattern and Mortality in Middle-Aged Men and Women, Addiction, 99(3): 323-330, 2004.

5. White IR, et al. Mortality in England and Wales attributable to any drinking, drinking above sensible limits and drinking above lowest risk levels, Addiction. 2004; 99, 6.

6. Klatsky AL, Alcohol and Cardiovascular Health, Integrative and Comparative Biology, 44, 2004.

7. Mukamal KJ et al, Roles of Drinking Pattern and Type of Alcohol Consumed in Coronary Heart Disease in Men, New England Journal of Medicine, 348(2), 2003.

8. Trevisan M et al, Drinking Pattern and Risk of Non-Fatal Myocardial Infarction: A Population-Based Case-Control Study, Addiction, Vol 99, No 3, 2004.

9. Trevisan M et al, Lifetime Drinking Pattern is related to Risk of Metabolic Syndrome, Circulation 2004; 110: III-833.

10. De Lange D et al, Rapid Intake of Alcohol (Binge Drinking) Inhibits Platelet Adhesion to Fibrinogen under Flow. Alcoholism: Clinical & Experimental Research, 28(10, 2004.The study's findings are published in the October 2004 issue of Alcoholism: Clinical & Experimental Research.

11. Mukamal KJ et al, Binge Drinking and Mortality Following Acute Myocardial Infarction, Circulation 2004; 110: III-743.

12. Trichopoulou A et al. Modified Mediterranean diet and survival: EPIC-elderly prospective cohort study. BMJ, 2005.

13. Knops, K et al, Mediterranean Diet, Lifestyle Factors, and 10-Year Mortality in Elderly European Men and Women, JAMA. 2004; 292 and Rimm E et al, Diet, Lifestyle, and Longevity—the Next Steps? , JAMA. 2004 or visit http://jama.ama-assn.org/cgi/content/full/292/12/1433

14. Reference: Esposito K et al, Effect of a Mediterranean-Style Diet on Endothelial Dysfunction and Markers of Vascular Inflammation in the Metabolic Syndrome, JAMA. 2004; 292 or visit http://jama.ama assn.org/cgi/content/abstract/292/12/1440

15. James Cerhan et al, Adherence to the AICR Cancer Prevention Recommendations and Subsequent Morbidity and Mortality in the Iowa Women's Health Study Cohort. Cancer Epidemiology, Biomarkers and Prevention 2004; 13

16. De Lorgeril M et al, Wine Ethanol, Platelets, and Mediterranean Diet, the Lancet, 353:1067, 1999.

17. Hendriks H F J et al, Moderate Doses of Alcoholic Beverages with Dinner and Postprandial High Density Lipoprotein Composition, Alcohol & Alcoholism, 4:403-410, 1998.

18. Augustin LS et al, Alcohol Consumption and Acute Myocardial Infarction: A Benefit of Alcohol Consumed with Meals, Epidemiology, Vol 15, No 6, pp767-769, 2004.

19. Klatsky A, Alcohol and Health: How much is good for you? Scientific American, February 2003.

20. Stranges, S et al, Differential Effects of Alcohol Drinking Pattern on Liver Enzymes in Men and Women. Alcoholism: Clinical & Experimental Research. 28(6): 2004.

21. Stranges S et al, Relationship of alcohol drinking pattern to risk of hypertension. A population-based Study, Hypertension, October 2004 (on line publication)

22. Augustin LS et al, Alcohol consumption and acute myocardial infarction: a benefit of alcohol consumed with meals, Epidemiology, Vol 15, No 6, 2004.

23. Mitka M., Where the Elite Meet To Eat-a CME Course, JAMA, 284(7), 2000.

24. US. Departments of Agriculture and Health and Human Services, Nutrition and Your Health: Dietary Guidelines for Americans, 6th edition, 2005.