

Moderate wine consumption as part of a Mediterranean diet and lifestyle under debate

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Abstract. Moderate wine consumption - with the meals - represents one of the beneficial components of the traditional Mediterranean diet (Med Diet) and a positive item in the Med Diet score. The Med Diet is considered one of the best diets in the world and the World Health Organisation (WHO) identified this eating pattern as an effective strategy to prevent non communicable diseases (NCD), since it is associated with lower disease incidence and all-cause mortality. Numerous well-conducted epidemiological studies have also reported that light-to-moderate intake of wine/alcoholic beverages is not only related to a reduced risk of cardiovascular disease, but also to all-cause mortality. At the same time, excessive consumption of alcoholic beverages is always associated with an increased risk of death and various health risks such as liver diseases, neurological disorders and some types of cancer, injuries, and car accidents, among others. Ever since a large population study (Global Burden of Disease GBD 2016) suggested in 2018 that any consumption of alcoholic beverages is harmful to health because of an increased cancer risk, the existence of the J curve has been denied and the health benefits of moderate wine consumption were questioned. However, in 2022, the same GBD scientists corrected their own data, and the results showed that the risks from the consumption of alcoholic beverages vary greatly depending on the disease, age and region. Based on these updated results, a moderate consumption of alcoholic beverages for individuals over the age of 40 years can provide health benefits, such as a lower risk of cardiovascular diseases and type 2 diabetes. Anyway, the influence of moderate alcohol consumption on health that was described by a J-shaped curve more than 20 years ago remains valid nowadays. On the other hand, more recent studies have underlined the importance of context when analyzing the effects of moderate wine consumption. Many observational epidemiological studies support the beneficial role of wine in the context of a Mediterranean eating and drinking pattern. However, a controversy still remains on this topic, mainly due to the lack of high scientific level evidence on the protective effects of moderate alcohol consumption on health such as those obtained in randomized controlled trials. The reasons for such scientific debate and the latest scientific evidence, including the conclusions from the first Lifestyle, Diet, Wine and Health Congress 2023 are exposed as will be whether the J curve is still valid today and which possible modifying (confounding) factors need to be taken into consideration when assessing the effects of moderate wine consumption on health, always with meals. Finally, the practical significance of this updated information for wine consumers is also discussed.

1. Introduction

Moderate wine consumption - with the meals - represents one of the beneficial components of the traditional Mediterranean diet (Med Diet) and a positive item in the Med Diet score [1-3]. The Med Diet is considered one of the best diets in the world and the World Health Organisation (WHO) identified this eating pattern as an effective strategy to prevent most of non-

communicable diseases (NCD), since it is associated with lower disease incidence and all-cause mortality [4].

Numerous well-conducted epidemiological studies have also reported that light-to-moderate intake of wine/alcoholic beverages is not only related to a reduced risk of cardiovascular disease, but also to all-cause mortality [5, 6].

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neurological disorders and some types of cancer, injuries, and car accidents, among others.

2. Current scientific debate/controversy

Inconsistent recommendations on alcohol consumption and the (scientific) debate contribute to a great uncertainty and confusion among moderate drinkers but also among health professionals advising their patients. Is moderate wine consumption still a good advice?

On the one hand, alcohol/ethanol (more precisely acetaldehyde) is categorized by the International Agency of Research on Cancer as a Group 1 carcinogen for humans and by the World Cancer Research Fund as a convincing carcinogen for mouth, pharynx, larynx, esophagus, stomach, liver, colorectal, and breast cancers [7], on the other hand, the Mediterranean Diet is regarded as one of the healthiest diets and moderate wine consumption during meals is a key feature.

Thus, a controversy with two opposite views currently exists about the best, most practical and realistic advice for adult drinkers [8]. There is the view that complete abstinence is the healthiest option for adults, affirming that “there is no safe level of alcohol intake” for anybody and suggesting a strong need to reduce the average alcohol consumption of the population regardless of their initial consumption levels, their age, and their baseline risk. On the contrary, there is a harm reduction strategy for these adults recommending “moderate” drinking (up to 1 drink a day in females and up to 2 drinks a day in males) and avoiding binge drinking. Interestingly, in large U.S. (and European) cohorts, an alcohol intake of 5–15 g/d for women and 5–30 g/d for men is one of the five elements of a lifestyle score which is robustly associated with longer life expectancy and with fewer chronic diseases [6, 9–11].

3. Global Burden of Disease Study as reference

3.1. 2018 Analysis

The purpose of the Global Burden of Disease (GBD) study was to calculate the relative risk of disease and injury associated with drinking at different alcohol consumption levels worldwide [12]. This GBD study suggested that any consumption of alcoholic beverages is harmful to health because of an increased cancer risk, the existence of the J curve has been denied and the health benefits of moderate wine consumption were questioned. Consequently, the drinking guidelines have been adjusted/lowered in several countries.

3.2. 2022 Analysis

In 2022, the same GBD scientists corrected their own previous analysis and the new results showed that the risks from the consumption of alcoholic beverages varied greatly depending on the previous diseases, age and region [13]. In the revised analysis from 2022, the disease rate as well as the subject's age and regional differences were

considered. Based on these updated results, they concluded that a moderate consumption of alcoholic beverages (and not zero consumption) can provide health benefits such as a lower risk of cardiovascular diseases and type 2 diabetes for individuals over the age of 40 years worldwide. This updated estimation of risk thus confirmed a J-shaped curve between moderate alcohol intake and disease risk for adults (aged 40 and above). Furthermore, the authors defined in this large modelling study, based on data from more than 200 countries, a theoretical minimum risk exposure level (TMREL) which is defined as the daily amount of alcohol consumption that is associated with the healthiest outcomes (the global TMREL for both sexes combined was 0.511 drinks per day, varying from 0 to 1.87 drinks per day depending on age and location). The researchers also calculated a threshold of consumption (nondrinker equivalent, NDE) at which the risk of a drinker is equivalent to that of a lifetime abstainer (the NDE varied between 0.19 and 6.9 drinks per day). In regions with a high cardiovascular disease risk, light-to-moderate amounts of alcoholic beverages were found to be associated with an improved health status confirming the results of many previous studies.

For more than three decades, epidemiological studies have consistently shown that light to moderate consumption of wine and other alcoholic beverages is associated with a lower risk of cardiovascular disease (CVD) and all-cause mortality compared to abstinence and heavy consumption. In such a J-shaped association, light to moderate drinkers live at least as long as abstainers and longer than heavy consumers. And the latest GBD analysis confirmed these findings.

It seems, however, that the 2022 updated GBD findings so far, have not been considered in the development of health policies. The authors recommended modifying “existing policy guidelines to focus on emphasizing differential optimal consumption levels by age, rather than the current practice of recommending different consumption levels by sex”. They further suggested that guidelines can be interpreted precisely and directly from their estimates, even though they only used the average amount of alcohol intake for their calculations and did NOT distinguish between different alcoholic beverages, nor did they account for drinking patterns. Previous research has highlighted the importance of the beverage type and drinking patterns in the estimation of alcohol-related morbidity and mortality [14–16].

4. Evaluation of health risk in context

When evaluating the relationship between wine/alcohol intake and health/disease risk, it is important to consider the context, such as eating and drinking patterns, beverage type, smoking status, body weight, physical exercise and other lifestyle factors since all these factors may influence the disease outcomes.

4.1. Mediterranean alcohol drinking pattern

Just considering the average alcohol consumption does not fully explain a J-shaped relationship where moderate drinkers have a lower disease/mortality risk than abstainers and excessive drinkers. Scientific evidence suggests that there are healthy or beneficial drinking patterns of wine which are associated with a reduced risk of death from all causes. These data come from observational studies in Mediterranean countries and support the beneficial role of wine in the context of a Mediterranean eating and drinking pattern. The Mediterranean-style alcohol drinking pattern (MADP) is characterized by low to moderate consumption of wine with meals spread throughout the whole week and avoiding binge-drinking [17-19]. These are important influencing factors for the biological effects of wine. Such MADP was inversely associated with all-cause mortality compared to alcohol abstinence [8, 20, 21]. Barberia-Latasa et al [8] even commented that these results may seem contradictory to the available evidence on the harmful effects on cancer, however, those studies only considered the grams of alcohol consumed and not the drinking pattern as studied in their analysis. Similar results were found in assessments of UK Biobank data [18, 22], including a recent study analysing 300,000 drinkers from the UK Biobank cohort. When only focusing on total alcohol consumption, they found that the same total amount of alcohol appeared to increase the chances of dying prematurely, if consumed on fewer occasions during the week and outside of meals. However, those participants who consumed wine moderately with the meals (as opposed to outside meals) had a lower all-cause and cancer mortality [16].

These findings suggest that various interrelated mechanisms exist. Antioxidant and anti-inflammatory components of the diet and wine may be involved in reducing the carcinogenic effect of ethanol [23, 24]. The evidence is limited and suggests a lower risk of all-cause mortality with high adherence to the Mediterranean dietary pattern together with MADP [8, 17, 21].

4.2. Wine in the Mediterranean Diet

It is more helpful to examine dietary patterns instead of single foods or nutrients to understand complex diet-disease associations [25]. Research data show that consuming a Mediterranean Diet (Med Diet) - rich in minimally processed foods - has been associated with a reduced risk of developing multiple chronic diseases and an increased life expectancy. The effect was even better when combined with healthy lifestyle habits (not smoking, physically active, avoiding excessive consumption of alcoholic beverages) [26-28]. Trichopoulou et al [1] reported that in the Greek EPIC (European Prospective Investigation into Cancer and Nutrition) cohort, moderate alcohol intake – mainly from wine – was the single most important item among the nine factors included in the

Mediterranean Diet score. Removing the item alcohol was associated with a 23.5% loss in the protection by the Med Diet against all-cause mortality. A meta-analysis also quantified the adherence to the Med Diet and all its components with all-cause mortality [3] and reached similar results [2, 29] where moderate wine consumption together with fruit, vegetables and whole grains were identified as protective components.

The exact mechanisms by which the traditional Med diet exerts its favorable effects on health are not yet fully understood and various hypotheses have been proposed. The likely mechanisms involve oxidative stress, inflammatory and vascular disease pathways as well an influence of the Med diet on arterial thrombosis and the individual gut microbiome. Red wine, extra-virgin olive oil, nuts, fruits, and vegetables - key components of the Med Diet - are all foods rich in polyphenols and other bioactive compounds and can contribute to the protective effects through different synergistic mechanisms [30] and their anti-inflammatory and antioxidant properties [3, 31, 32].

Thus, it seems obvious that for accurately assessing the association between wine consumption and health risks, the (dietary and lifestyle) context is important.

4.3. Lifestyle, Diet, Wine and Health Congress 2023

The extent to which lifestyle habits, drinking and dietary patterns and beverage-specific ingredients affect the health risk and may contribute to longevity have also been addressed during the first Lifestyle, Diet, Wine and Health Congress in Toledo 2023.¹

The international researchers re-confirmed the validity of the J curve with regards to the consumption of alcoholic beverages, total mortality, and cardiovascular diseases. This evidence had already been reported in many studies and meta-analyses during the last 30 years. Some recent large population studies, which excluded former drinkers or included only current drinkers, showed similar results, refuting the more recent debate that attributed the beneficial effects of low consumption to bias introduced by former drinkers (“sick quitters”). The latest GBD Study 2022 and limitations of such modelling studies (i.e., estimated average alcohol consumption, lack of eating and drinking patterns and lifestyle context) were discussed. The Mediterranean Diet was highlighted as the best preventive diet with respect to cardiovascular disease mortality and total mortality as well as for a greater life expectancy with fewer chronic diseases.

The Mediterranean lifestyle was introduced during the congress, expanding the concept of moderation to many aspects of life, including physical exercise, stress management, quantity and quality of sleep, enjoying meals in good company and in combination with environmental sustainability and culinary pleasure. The importance of a

¹ <https://2023.lifestyle-wine-congress.com/>

good quality sleep was emphasized, a premise that has recently been included by the American Heart Association among the seven essential elements of health in addition to a healthy diet, weight control, blood pressure, lipids and glucose, exercise and not smoking.

Concerning cancer, the scientists presented different mechanisms in which alcoholic beverages can impact the cancer risk. Although there is a linear relationship between excessive alcohol use and cancer, the effect of low doses is not as clear and more controversial. When wine is consumed in the context of the Mediterranean eating and drinking pattern and lifestyle, scientific evidence shows that low to moderate amounts of wine do not seem to increase the risk of some types of cancer.

One of the most important conclusions of this international congress was that the impact of moderate wine consumption on health can only be assessed correctly in the context of eating and drinking patterns and lifestyle factors (such as not smoking, exercising regularly, having a normal body weight), only looking at the average alcohol consumption will distort the risk.

4.4. Randomized controlled trial for more certainty

Until now, the PREDIMED [33] and CORDIOPREV [34] intervention trials provided the strongest evidence for a causal inference between a Mediterranean diet and cardiovascular disease (CVD), where the incidence of CVD was reduced by 30% and 28%, respectively, compared to a low-fat diet. Similar results have been achieved by various researchers around the world showing benefits of the Med Diet including moderate wine consumption.

Otherwise, the best available scientific evidence concerning the association between moderate wine consumption and health comes from observational studies or modelling studies with their respective limitations. Only a large randomized controlled trial can provide stronger evidence for this relationship. Recently, Martínez-González [35] attempted to answer the question: "Should we remove wine from the Mediterranean diet?" by summarizing the opposing views (and their respective flaws) in the current moderate drinking debate. He concluded that because of the potential limitations compromising each of these two opposing positions, there is need for stronger sound evidence of a large randomized controlled trial. Such a trial with 10 000 Spanish participants (above 50 years of age) drinking a glass of wine with their meals for 5 years has just been started by researchers at the University of Navarra and is funded by the European Research Council.

5. Conclusions

It seems that the scientific evidence about moderate wine consumption with meals and the possible health effects has not changed. However, various factors should be taken into consideration: consuming wine moderately and with meals as well as the context of the overall diet and lifestyle

habits. According to the best available data to date, light to moderate wine consumption, preferably as part of a Mediterranean-style diet and a healthy lifestyle, can reduce the risk of CVD and all-cause mortality and contribute to a longer life with fewer chronic diseases. In this context, the cancer risk is not increased. The scientific findings accumulated during the last four decades and those published in the past six years still show that the J-shaped curve for wine/alcoholic beverages and health is valid. The results of epidemiological studies, however, do not generally apply to all individuals in all circumstances and risks vary between individuals. Thus, for some individuals, the better choice may be complete abstinence.

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