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Editorial commentary: A chemically complex and unique beverage: The wine ☆

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In this issue of Trends in Cardiovascular Medicine, Haseeb and collaborators [1], summarize information sprouting from the "sophisticated branch of interconnected research encompassing the science of winemaking, grape growing, and the analytical, organic, and physical analysis of wine", highlighting important aspects of wine history, production, classification and chemical composition. This work is an extension of a recent review published by the same authors in Circulation [2] in which they focus on the good and the bad of wine consumption on human health.

Several issues sustain the continuous effort of much laboratory research on wine. A major point of attention is the growing popularity of this unique beverage and its large consumption worldwide, with a consequent alert for human health. At the same time, epidemiological evidence and cross-cultural studies raise the hypothesis of a negative correlation between moderate wine consumption and ischemic heart disease (IHD) [3,4]. This seems to be particularly true in the case of red wine, due to its high content of polyphenols and other bioactive constituents [5,6].

In their review, Haseeb et al. [2] start from the well-accepted assumption that bioactive red wine components, such as ethanol and polyphenols, represent major elements of the beneficial cascades activated by wine in the cardiovascular system. The authors propose that these two compounds may elicit protection against chronic cardiovascular diseases only when acting synergically. This is the case of red wine in which both are highly present. Examples of these advantages are the improvement of lipid profile, the increase in HDL cholesterol, the reduction of blood pressure and platelet aggregation, and fibrinolysis induction, as observed under the regular consumption of light-to-moderate amounts of red wine. [1,7,8] In line with this, the authors illustrate the peculiarity of the "French Paradox", a condition resulting from a decreased incidence of IHD despite the high saturated fat diet that is common in France [9] and attributed to red wine consumption.

As summarized by the authors, the history of wine, whose term derives from the Latin word, vinum, goes back to ancient Romans and Greeks. Starting from Christianity, the chemical process of production and consumption of this alcoholic beverage, produced from the fermentation of must or grape juice, gradually expanded globally [10]. In 2016, the global wine production was 267 million hectolitres (mhl), Italy being the major producer (50.9 mhl), with 19.1% of the world's wine produced [11].

Wine production is considered as both art and science; wine is an integral component of the culture of many countries and its array of flavors generate sensations that make its unique characteristics difficult to define [12]. To this, more than 500 compounds that have been analytically identified in wine [13] might play a cooperative role in the determination of its taste profile [14]. Among these, polyphenols, which include flavonoids and not- flavonoids, are biologically active in humans and they are of large clinical interest considering their antioxidant potential and their radical scavenger properties that confer to the wine the typical protective cardiovascular effects, as confirmed by basic and clinical research [1,15,16]. Since the ancient Egyptians, wine has been used as a medicinal agent [17], and Hippocrates considered it an important element for diet and health [18].

The authors agree with the general consensus regarding the deleterious effects on the cardiovascular system, and on mortality, induced by an excessive consumption of wine, as well as on the reduction in IHD risk due to light-to-moderate consumption of wine, as concluded by the American Heart Association [16,19] and as reviewed by the authors [1,2].

Despite the World Health Organization guide for hazardous and harmful drinking and the American Heart Association advisories, the alcohol consumption guidelines should be improved and universally recognized in order to fill the knowledge gaps existing

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among the appropriate intake and risks and benefits of alcohol and wine consumption.

Altogether, the authors add to the expanding scenario regarding the complex research of wine and its cardiovascular effects, helping to address the gap on specific topics unusual for a clinical point of view. Of course, this will attract further attention and many open questions remain to be answered.

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