Alcoholic disease: understanding the scope of the problem and what we need to do to tackle it

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Introduction

Alcoholic beverages have been used in human societies since the beginning of recorded history. However, there is evidence that alcohol consumption is worldwide responsible for about 3.2% of global mortality and for about 4% of life years lost, according to the World Health Organization (WHO) in its annual report from 2002 [World Health Organization, 2002a]. If Europe is considered alone, the numbers are higher, with 4% of global mortality and 7.9% of years of life lost prematurely [World Health Organization, 2002b].

The aim of this manuscript is to briefly review the impact of alcohol drinking on the health of the population. Furthermore, it aims to discuss what is actually being done to minimize the problem and to speculate on what more should be done.

How serious is the problem?

Effect of alcohol consumption on morbidity and mortality

To evaluate the effect of any particular factor on a population, a useful measure created by the WHO is the disability-adjusted life year (DALY). This is a time measure including the sum of years of life lost due to premature mortality plus the years lived in less than full health [Murray and Lopez, 1994; Murray, 1996]. Using this measure, alcohol is responsible for 17.3% of male and 4.4% of female DALYs in Europe, after accounting for health benefits [Rehm *et al.* 2009]. A disproportionate amount of the burden of disease is seen in young people, with alcohol being responsible for over 10% and 25% of female and male youth mortality, respectively [Anderson and Baumberg, 2006]. In fact, alcohol consumption ranks third as a cause of premature death and disability in the

European Union (EU), just after tobacco smoking and high blood pressure [World Health Organization, 2004]. In Portugal, the burden and costs of alcohol-related harm have been evaluated recently, demonstrating that DALYs from alcohol are about 15% of the total DALYs for the year that was studied [Cortez-Pinto *et al.* 2010].

Societal effects

In addition to the above-mentioned effects of increased morbidity and mortality, alcohol consumption also has a negative effect on society, diminishing the quality of life of both drinkers and their family and those who share their professional environment. In fact, a recent study has shown that alcohol is the most harmful drug, when compared with a series of other drugs such as tobacco or heroin, mostly due to the fact that alcohol simultaneously causes a high level of harm to both the individual and to others [Nutt *et al.* 2010].

Alcohol-related diseases

Chronic alcohol-related diseases depend on the total of amount of alcohol consumed, and should thus carry a greater share of the total burden in countries in which total *per capita* consumption is high and with a regular drinking pattern. On the other hand, acute alcohol-related events tend to be more frequent in countries with a binge-drinking pattern. However, recent years have shown an increase in the binge-drinking pattern, particularly in young people, and there is evidence that binge drinking can cause liver cirrhosis, with the risk increasing with the number of binge episodes [Mathurin and Deltenre, 2009]. This evidence comes from experimental as well as epidemiological studies [Parrish *et al.* 1993]. Aside from the effect on the liver, binge drinking has also been

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associated with an increased risk of atrial fibrillation and ventricular arrhythmias, myocardial infarction, as well as hemorrhagic and ischemic strokes.

The importance of alcohol as a cause of liver disease is well demonstrated by the data from the European liver transplantation registry showing that alcohol represents one third of the causes of cirrhosis leading to liver transplantation, and it is the second cause for liver transplantation even though alcoholics are probably less transplanted than other patients [Burra *et al.* 2010]. It is also of note that there has been a recent increase in the number of patients transplanted due to alcoholic liver disease [Burra *et al.* 2010]. There is also evidence of a marked increase in liver cirrhosis mortality in Eastern European countries, the United Kingdom and Finland [Fleming *et al.* 2008; Makela, 2009; Zatonski *et al.* 2010]. A Portuguese study also found that liver diseases represent from the major proportion of DALYs at 31.5%, followed by traffic accidents, neoplasia and cardiovascular diseases [Cortez-Pinto *et al.* 2010]. In addition to the effect on the liver, it is increasingly recognized that alcohol has a very important role in several other diseases, such as cardiovascular disease, showing a very strong risk association with hypertension and hemorrhagic stroke [Sundell *et al.* 2008; Taylor *et al.* 2009] and cancer. Indeed, alcohol metabolism produces acetaldehyde, strongly involved in alcohol-associated carcinogenesis; in addition, ethanol itself stimulates carcinogenesis by inhibiting DNA methylation and by interacting with retinoid metabolism [Toh *et al.* 2010]. The importance of alcohol as a risk for cancer, namely of the oral cavity, pharynx, esophagus, liver, colon, rectum, larynx and female breast have been well recognized [Seitz and Becker, 2007]. According to the WHO estimates for global burden of disease, more than 389,000 cases of cancer were attributable to alcohol drinking worldwide, thus representing 3.6% of all cancers (5.2% in men, 1.7% in women), during the year 2002 [Boffetta *et al.* 2006]. Similar results were found by the International Agency for Research on Cancer, which found that alcohol is a risk factor for upper aerodigestive tract cancer (oral cavity, pharynx, hypopharynx, larynx and esophagus), liver cancer, colorectal cancer and breast cancer [Baan *et al.* 2007]. In fact, it was only recently that the increased risk for breast cancer, even for very low consumptions, was highlighted and documented, with breast cancer comprising 60% of alcohol-attributable cancers

in women [Key *et al.* 2006]. It is also of note that alcohol consumption and smoking has a synergistic effect on the risk of some of these cancers [Taylor and Rehm, 2006; Toh *et al.* 2010].

Alcohol-induced behavioral disorders

Changes in behavior associated with alcohol are also a major cause of intentional and unintentional injuries, either to the drinker or to others. It is also an important cause of professional absenteeism and low performance, as well as family violence and disruption. Alcohol is also a potent teratogen and a cause of neurological and psychiatric disturbances [Haycock, 2009].

Economic burden

It was estimated that the total tangible costs of alcohol to the EU in 2003 were about €125 billion (€79–220 billion), equivalent to 1.3% of gross domestic product (GDP), largely exceeding the reported contribution of around €9 billion to the goods account balance for the EU [Anderson and Baumberg, 2006]. Furthermore, it seems to contribute towards health inequalities between and within European Member States, due to more frequent risky alcohol use in lower socioeconomic groups and also to greater mortality from directly alcohol-related conditions [Anderson and Baumberg, 2006; Rabinovich *et al.* 2009].

How to deal with the problem

Considering how important alcohol is as a health risk factor and such a heavy economic burden for the health system, it is natural to consider that measures need to be taken to reduce/change patterns of consumption. However, as opposed to tobacco that is always harmful, drinking alcohol can be a harmless activity that is very strongly rooted in our society. As a result of this duality, it becomes particularly difficult to delineate effective measures to reduce consumption, and to implement them.

One of the first controversies is what the safe drinking limit is? Regarding the threshold for liver cirrhosis, in a recent meta-analysis, Rehm and colleagues found an increased risk of mortality from liver cirrhosis among men and women drinking 12–24 g of ethanol per day [Rehm *et al.* 2010], and a large epidemiological study on Italy, found that there was an increased risk of cirrhosis in those drinking 30 g of ethanol per day

[Bellentani *et al.* 1997]. It is more difficult and controversial to find a threshold in the case of binge drinking [Mathurin and Deltenre, 2009]. It is possible that for some diseases there is not a safe limit. For example, in breast cancer, a recent meta-analysis that included 98 studies reported a 10% increase in breast cancer risk per 10 g of alcohol consumed per day, with no definition of a safe threshold [Key *et al.* 2006].

Alcohol policies and their effectiveness

As a consequence of the increased awareness of the risks of alcohol consumption, several targeted policy areas have been developed, including information and education, health sector response, community programs, drink-driving policies, availability of alcohol, marketing of alcohol beverages, pricing policies, harm reduction and reducing the effect of illegally produced alcohol.

Concerning information and education, interventions are not expensive, but several systematic reviews of this kind of program have demonstrated that they do not notably affect consumption levels or health outcomes [Anderson *et al.* 2009a; Jones, 2007], although information and education are important to convey awareness and knowledge of the problem.

On the opposite side, drink-driving policies seem to be particularly effective, especially if they are effectively implemented and rigorously enforced [Anderson *et al.* 2009a]. Also, brief interventions with those who are at risk seem to be useful [Kaner *et al.* 2009].

Reducing availability of alcohol seems to be one of the most effective measures, either through pricing policies or the hours and places of sale and minimum purchase-age laws [Rabinovich *et al.* 2009; Wagenaar *et al.* 2009]. In fact, laws that set a minimum age for the purchase of alcohol show clear reduction in drink-driving casualties and other alcohol-related harm. Also, reduction of the hours or days of sale leads to fewer alcohol-related problems. However, there is evidence that strict restriction can lead to an illicit market.

Regarding pricing policy, an inverse correlation between alcohol price and consumption has been very well demonstrated. In fact, a recent report commissioned by the EU concluded that there is a positive relationship between alcohol affordability and alcohol consumption, and also between

alcohol consumption and three types of harm: traffic injuries, traffic deaths and liver cirrhosis [Rabinovich *et al.* 2009]. The report also concludes that cross-border alcohol consumption due to tax differentials can lead to increases in consumption [Rabinovich *et al.* 2009].

Indeed, increasing alcohol taxes reduces alcohol consumption and related harm and increases government revenue. The effect tends to be stronger in the long term, delaying the start of drinking and slowing young people's progression to heavy drinking. It also reduces heavy drinking in young people and the volume of alcohol per occasion, and has a much stronger effect on heavier than on light drinkers. Also, alcohol marketing has a major impact on levels and patterns of consumption, especially in young people [Anderson, 2009]. In fact, there is a lot of impressive and sophisticated advertising in mainstream media. Powerful marketing campaigns link alcohol brands to sports and cultural activities, through sponsorships, Internet, podcasting and mobile phones. It has been shown that exposure to alcohol advertising has an effect on initiation of young drinking and on riskier patterns of youth drinking in 13 longitudinal studies including 38,000 young people [Anderson *et al.* 2009b]. Furthermore, young people are likely to continue to increase their drinking as they move into their twenties. Also, the effects of exposure are cumulative. Individuals with higher consumption in their midteens tend to be those with heavier consumption, alcohol dependence and alcohol-related harm, including poorer mental health and educational outcome, and increased risk of crime, in early adulthood [Englund *et al.* 2008].

Discussion

Although alcohol policies have been well defined, they have been shown to fail, probably as a consequence of the power imbalance between industry and health groups. In fact, alcohol producers are well organized and effective lobbyists for industry-friendly policies, nationally and internationally. Their main focus is to crusade *against effective strategies* and *for ineffective strategies*. Also, they tend to fund *responsible drinking campaigns* that are at the least ambiguous in message. Also, they create networks very active in the arena of alcohol policy, tending to influence law making by 'generous' donations of millions of dollars to political and social organizations [Casswell and Thamarangsi, 2009].

There is now a need to create forceful measures, including the regulation of all marketing, including bans on sponsorship, implementation and strict surveillance on drink driving.

Recently, there has been a trend towards reinforcing international support of alcohol policies. In May 2010 WHO issued a resolution on a 'global strategy to reduce the harmful use of alcohol' [World Health Organization, 2010] and also published an impressive amount of data regarding alcohol consumption and alcohol-related harm throughout the world and in particular in Europe [World Health Organization, 2004, 2006, 2007]. In 2007, the European Alcohol and Health Forum (EAHF) was created in order to provide a common platform for all interested stakeholders at EU level that are interested in building up actions relevant to reducing alcohol-related harm, notably in trying to reduce consumption in children and adolescents, and increasing information for consumers, and decreasing harmful commercialization and sales techniques [Celia *et al.* 2010]. Criticisms can be made of the fact that the alcohol industry is part of the latter organization, contrary to what has been suggested, i.e. that the alcohol industry should never be part of these organizations or at least that their role should be downgraded to one of consultation [Casswell and Thamarangsi, 2009; World Health Organization, 2007].

Also, the European Association for the Study of the Liver (EASL), now a member of the EAHF, has published the EASL Position on EU Alcohol Policy [EASL, 2010], where in its general principles, it acknowledges among others, the major risk that alcohol represents for liver disease, the close inverse correlation between price and consumption, the need to reduce consumption and the importance of marketing practices. Recommendations are made to improve surveillance of alcohol consumption and its impact on liver and other alcohol-related diseases. Also, the importance of implementing forceful measures, including regulation of all marketing, banning the advertising of alcoholic beverages and the sponsorship of sporting, cultural and university events, and price-based promotion of alcoholic beverages was recommended. Furthermore, EASL emphasized the fact that EU states have to be responsible for the effective application of alcohol-related laws and the need for penalization of those who do fail to comply.

In general, it seems that there is an increasing awareness of the severity of the problem that excessive alcohol consumption represents and steps are being taken in the right direction. It is now our obligation to make all possible efforts to ensure those steps are actually accomplished and do not remain solely as declarations of intent.

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