No Safe Level of Alcohol Consumption – Implications for Global Health

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Epidemiological data on the growing healthcare burden from alcohol use, globally, continues to accrue. Over recent months, two large epidemiological assessments of the impact of alcohol use worldwide have focussed even more attention on this issue. The Global Burden of Disease Study (GBD)[1], coordinated by the Institute for Health Metrics and Evaluation, in Washington, provides a comprehensive estimate of the mortality and loss of health attributable to alcohol. Taking a broader perspective, the Global Status Report on Alcohol Health (GSRAH)[2], coordinated by the World Health Organisation (WHO) collates data on global patterns of alcohol consumption as well social, economic and health-related impacts. Taken together, these reports suggest a 'globalisation' of alcohol use , with clear implications for the liver community and beyond.

The GBD 2016 study uses alcohol consumption data from 694 individual and population-level data sources, and 592 studies on relative risks of alcohol use, to estimate global alcohol-related health burden. The authors have addressed methodological limitations of previous analyses, by accounting for heterogeneity of the non-drinker reference population in some studies (the so-called 'sick quitters'), as well as accounting for inaccuracies in population-level consumption data due to tourism and unrecorded alcohol production. The findings are striking. The key headline of 'no safe level of alcohol consumption' has attracted much press attention. This finding is based on novel analyses of available data to determine alcohol-attributable risk, which demonstrate that protective effects for ischaemic heart disease and diabetes

in women are completely offset by monotonic associations with cancer. The level of consumption that minimizes an individual's risk is 0g of ethanol per week.

Overall, alcohol was the seventh leading risk factor for death and disability, accounting for 2.8 million deaths in 2016. This corresponded to 6.8% (95% uncertainty interval 5.8–8.0%) of male deaths and 2.2% (1.5–3.0%) of female deaths. Among individuals aged 15-49 years alcohol was the leading cause of death, accounting for 12.2% (10.8-13.6%) and 3.8% (3.2-4.3%) of deaths in males and females respectively, although the primary causes of alcohol-attributable death in this age group were tuberculosis, road injuries and self-harm. By contrast, chronic liver disease was a major burden of death and disability in the over-50 age group, and particularly within countries with a lower socio-demographic index (SDI). When divided by quintiles, chronic liver disease was the second largest disease burden in the low SDI countries, after tuberculosis. Liver cancer was also a major disease burden across SDI quintiles, particularly in females.

The greater burden of chronic liver disease in low SDI countries is also mirrored by global trends in alcohol consumption from the GSRAH. This report, from the WHO, collates data from the WHO Global Survey on Alcohol and Health 2016, issued to all WHO member states with a response rate of 89.2% covering 98.3% of the world's population, and also from published surveys. The key findings are that annual alcohol consumption continues to increase globally, from 5.5 litres per capita in 2005 to 6.4 litres in 2016.

Although there is a slight decrease in consumption in Europe, this is offset by a large rise in the Western Pacific and SE Asia. Projected trends indicate the global average is likely to reach 7.0 litres by 2025, with an increase of 2.2 litres expected in India alone. In terms of alcohol-related harm, the WHO report demonstrates a similar level of mortality directly attributable to alcohol, 5.3% of deaths globally, with the largest component due to digestive diseases (21.3%), followed by unintentional injury (20.9%). Recent data from the Million Women Study also highlights the risk of liver disease with daily drinking at even moderate levels (>2 drinks/day)[3].

Collectively, these data paint a picture of globalisation of alcohol-related harm, including liver disease, over the coming decades. The developing world already carries a large share of the load of liver disease – the highest numbers of deaths due to liver disease are in Asia and the Pacific. India alone accounts for one-fifth (18.3%) of all cirrhosis deaths globally[4]. Given the changing trends of liver disease in Asia, from viral hepatitis to an increasing burden of alcohol and fatty liver disease, this pattern can be predicted to intensify over coming decades. Other existing data support this trend. For example, Hao et al[5] and Tang et al[6] report that alcohol consumption is increasing faster in China than in other parts of the world. Global trends in the incidence of alcohol-related liver disease (ARLD) are harder to pin down – accurate mortality data are not available for almost one-third of countries, and studies are also limited by referral bias in countries where there are few liver units. Nevertheless, data from liver centres in China demonstrate that the burden of ARLD has more than doubled during the last decade[7].

Aside from per capita consumption of alcohol, the risk of alcohol-related harm is also influenced by pattern of drinking, and concomitant metabolic risk factors. Data from the GSRAH also highlight the global disparity in drinking patterns, using data on the heavy episodic drinking (HED – defined as defined as 60 or more grams of alcohol on at least one occasion, at least once per month). The prevalence of HED is highest in the Russian Federation and areas of Eastern Europe, but also some sub-Saharan African countries (eg. Angola, DR Congo). When rates of HED amongst only current drinkers are considered, the prevalence in SE Asia rises to over 40%, similar to Europe.

The GSRAH also focuses on the greater 'harm per litre' of alcohol for socio-economically disadvantaged drinkers. This 'alcohol paradox' describes the increased susceptibility of poorer drinkers to alcohol-related harms, including injuries, infectious diseases as well as liver disease, after adjusting for known confounders. This effect has been demonstrated in developed societies, but it remains unclear how robust this observation is in developing countries[8,9]. Grittner et al partially explore this, by comparing population surveys from 25 countries across SDI categories and controlling for drinking patterns, and consequently found that male drinkers reported greater alcohol-related harm (termed 'external' consequences) in lower-income countries than in higher-income countries[10]. The durability of this observation has clear implications for developing countries where alcohol use is predicted to grow.

In parallel, and of relevance to these observations, large cohort studies also support an interaction of obesity and alcohol with ARLD risk. Hart et al. analysed data from two large cohort studies conducted in Scotland, demonstrating that despite a small absolute risk for liver disease in obesity, the relative risk in individuals with a BMI >35 doubles for any given intake of alcohol[11]. More recently, Aberg et al., using data from the Finnish Health 2000 cohort, found a synergistic interaction between alcohol and multiple components of the metabolic syndrome in the development of liver disease[12]. Specifically, they found that alcohol remained a significant risk factor in the presence of an unfavourable metabolic profile, even if consumed at low-risk levels. Since there is a strong relationship between obesity and low socioeconomic status, this is a further mechanism for alcohol and obesity to strike a ‘double hit’ on health inequalities in liver disease.

A further facet of this debate is the impact of economic development within a society, from poorer to richer, on alcohol-related harm is also complex. Over recent decades, the commercialization of alcohol has been rapid in developing countries. For example, the exploitation of alcohol markets in Eastern Europe after the dissolution of the Soviet Union led to dramatic increases in alcohol consumption levels and associated harms, although these have to some degree been countered by new market control measures[13]. Thus, economic development in developing countries is likely to prove double-edged for alcohol-related morbidity, with persistent harm through commercialization despite expected reductions in socio-economic disparity.

Clearly these reports have important messages for public health programmes in developing countries, particularly in Asia and sub-Saharan Africa, although currently policy efforts seem to be lacking. According to GSRAH less than half of middle- and low-income countries have a written national alcohol policy, and even fewer have dedicated funding to implement such a policy. These high-quality data, recently published in the GBD and GSRAH reports, have been discussed in the media and in some cases criticised for the manner in which the messages have been presented (the authors provided only relative risks, not absolute risks, for absolute consumption). Nevertheless, they sound a clear warning of the risks of even low-level alcohol consumption, and the globalisation of alcohol-related harms, which should be heard by health practitioners in every part of the world.

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