

Mortality and alcohol consumption

Non-drinkers shouldn't be used as baseline

EDITOR,—The interpretation of the finding that light or moderate drinkers have a lower mortality than non-drinkers remains controversial.¹ The original cohort of 34 000 male doctors was recruited in 1951, and information on alcohol consumption was obtained from the surviving third of the men some 27 years later (1978) and from the surviving quarter 40 years later (1991). The authors make no comment on the possible implications of these large gaps in time or on the issue of survivorship.

The British regional heart study has shown that middle aged male non-drinkers are likely to be ex-drinkers, are older, and have higher rates of a wide range of diseases and of drug treatment than light or moderate drinkers.² Non-drinkers should not be used as a baseline against which to measure the effects of alcohol consumption. The proportion of British doctors who are ex-drinkers cannot be assessed on the basis of those few non-drinkers who spontaneously mentioned previous drinking, and further estimates of previous drinking are based on survivors 40 years after recruitment, who are obviously likely to be healthier than those who died. There is a clear tendency between 1978 and 1990 for men drinking ≥ 15 units a week to move towards lighter or non-drinking status rather than continuing with a stable intake (table II in the paper), and Wannamethee and I have shown that diminishing alcohol intake with increasing age is closely associated with increasing ill health and drug treatment.³

Non-drinking doctors have a higher mortality than drinkers even when divided into those with and without "previous disease." Because the shape of the two curves is similar Richard Doll and colleagues conclude that previous disease has little relevance to the relation observed between alcohol intake and mortality, although they have not adequately examined the characteristics of non-drinkers in either group.

In the study of British doctors deaths from ischaemic heart disease showed no significant trend with alcohol intake, although non-drinkers had a somewhat higher mortality than those drinking 1-14 drinks a week. An early report from the British regional heart study also showed no significant relation between alcohol intake and the incidence of heart attacks, although men drinking 1-2 British units daily had the lowest incidence.⁴ This group contained the lowest proportion of current smokers and had the lowest mean blood pressure and body mass index and the highest levels of physical activity in leisure time. Doll and colleagues have not examined the issue of such advantageous characteristics, although they might be more relevant than the direct effects of alcohol. In a 9.5 year follow up of the cohort in the British regional heart study men drinking 2-6 British units a day showed a non-significant reduction in the risk of death from ischaemic heart disease compared with occasional drinkers, little reduction in total cardiovascular mortality, and no reduction in total mortality.⁵

Doll and colleagues' conclusion that the present guidelines should acknowledge the important disadvantages to health of total abstinence goes beyond the information available in their study. It

implies that middle-aged and elderly British men should drink alcohol to reduce their risk of death from all causes. Surely it would be preferable to attempt to reduce the population risk of premature death by paying attention to smoking, diet, and physical activity?

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- 1 Doll R, Peto R, Hall E, Wheatley K, Gray R. Mortality in relation to consumption of alcohol: 13 years' observations on male British doctors. *BMJ* 1994;309:911-8. (8 October.)
- 2 Wannamethee G, Shaper AG. Men who do not drink: a report from the British regional heart study. *Int J Epidemiol* 1988;17:307-16.
- 3 Wannamethee G, Shaper AG. Changes in drinking habits in middle-aged British men. *J R Coll Gen Pract* 1988;38:440-2.
- 4 Shaper AG, Phillips AN, Pocock SJ, Walker M. Alcohol and ischaemic heart disease in British middle-aged men. *BMJ* 1987;294:733-7.
- 5 Shaper AG, Wannamethee G, Walker M. Alcohol and coronary heart disease. A perspective from the British regional heart study. *Int J Epidemiol* 1994;23:482-94.

The dose-response relation is probably linear

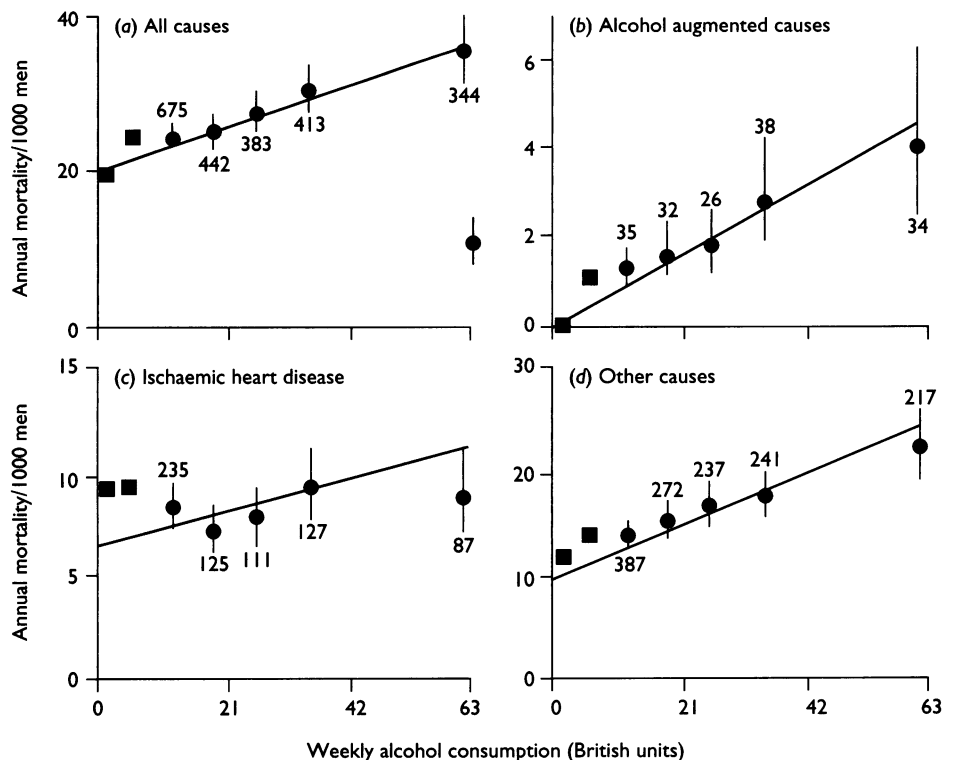
EDITOR,—Richard Doll and colleagues claim a U shaped dose-response curve for mortality and alcohol.¹ If valid, their observations have profound implications for health education. Their findings are being widely interpreted as proving that drinking a few drinks every day leads to a longer life than drinking no alcohol at all. Regrettably, the infelicitous design of their questionnaire means that the reported findings are invalid and the conclusions potentially seriously misleading. The questionnaire was faulty in at least three ways: it

failed to differentiate subjects who had never been drinkers from former drinkers; it failed to differentiate former drinkers who had successfully abstained from those who had relapsed but who happened not to be drinking at that time; and it invited those who preferred not to state their consumption to say that they were drinking less often than weekly, thus inviting respondents to conceal the extent of their consumption.

The authors' post hoc attempt to separate never drinkers from former drinkers must have greatly underestimated the number of former drinkers. Surveys suggest that the true number of former drinkers was likely to have been about 33% of self reported non-drinkers and not 3% as claimed.² To this number must be added an unknown number of drinkers who stated that they were non-drinkers (say, 10%). Thus 43% of non-drinkers could have been former drinkers or heavy drinkers. Additionally there would have been an unknown number of heavy drinkers claiming to be light drinkers (again, say, 10%).

Evidence of misclassification is provided by the data for disease augmented by alcohol. Among 19 deaths in non-drinkers eight were due to cancers of the upper aerodigestive tract or liver and two were due to cirrhosis of the liver. This provides evidence that up to 10 of the 19 (53%) non-drinkers were or had been heavy drinkers.

Probably 43-53% of doctors classified as non-drinkers therefore were or had been heavy drinkers. I have assumed here that the true figure was 50% and have corrected for misclassification using the assumption that the mortality for non-disclosing and former drinkers was high, corresponding to a consumption of 84 units a week. The corrected results are consistent with a linear dose-response relation (figure) suggesting that alcohol



Annual mortality per 1000 men from (a) all causes, (b) alcohol augmented causes, (c) ischaemic heart disease, and (d) other known causes by alcohol consumption when data from Doll and colleagues' study are corrected for misclassification at zero and light drinking (1-7 units) points