Alcohol consumption, nutrition, cardiovascular disease and iron status in South Africa: implications for South Africa's drinking guidelines

This series of articles deals with alcohol abuse in South Africa, one of the main economic, social and health problems contributing greatly to the burden of disease in South Africa. The article by Setlalentoa et al[1] provides a useful backdrop to the historical and social aspects of the causes and consequences of alcohol use and abuse in South Africa. The narrative article by Pisa et al[2] is a useful overview of the biological hazards associated with alcohol use and its metabolic products, and the teratogenic effects of alcohol consumption. The authors argue that, while *abstinence for all* may be a preferable "solution" to promoting continued abstinence for non-drinkers and moderate drinking for those who drink, a move to banning alcohol, rather than reducing drinking, could be both impractical and have deleterious societal consequences.

Two articles (Gopane et al[3] and Serfontein et al[4]) are based on the Transition and Health during Urbanisation in South Africa (THUSA) survey conducted in North West province in 1996 and 1998. The participants comprised 1 757 apparently healthy men and women and the data were collected in various communities with different levels of urbanisation in North West province. The study by Gopane et al[3] focuses on aspects of the main two supposed benefits of alcohol consumption on health; namely the cardioprotective effects (through increased HDL cholesterol, HDL-c, and haemostasis) and the effects on iron (FE) status. They found positive associations between alcohol consumption and HDL-c levels; but of concern is the finding that a much higher proportion of those who consumed alcohol were in positive iron balance, defined as a serum ferritin concentration > 150 μg/L. Among males, this was the case in 46% of the drinkers and 25% of the non-drinkers. For females, the corresponding figures were 23% and 11%, respectively. Gender differences in the findings are also in evidence. The authors are of the opinion that it is still early to conclude that moderate drinking is beneficial for health. However, their findings in connection with the iron balance are based on comparisons of drinkers and non-drinkers, hence no distinction is made between moderate and heavy drinking. Given these findings (and in spite of possible limitations in the study), it would be premature to recommend moderate drinking to those who do not drink alcohol at all.

The article by Serfontein et al[4] focuses on alcohol intake and nutrient density in a population in transition. They found that the mean alcohol intake amongst non-, light/moderate and heavy drinkers were 0, 3.7 and 36.6 g/day for the women, respectively. For the men, they were 0, 8.3 and 80.4 g/day, respectively. For the three groups, the contribution of alcohol to total dietary energy was found to be 0%, 1.5% and 11.7% for the females, while for the males, it was 0%, 2.8% and 18.1%. Unexpectedly, there was no strong evidence of micronutrient dilution as a result of alcohol consumption. The overall levels of energy consumed per day were highest amongst the heavy drinkers, compared to the light/moderate drinkers and non-drinkers; and the female heavy drinkers ate more protein-rich food. No differences in Body Mass Index (BMI) were observed across the three groups of non, light/moderate and heavy drinkers. There was no evidence to support the hypothesis of increased micronutrient dilution as a result of alcohol consumption. However, controlling for socio-economic status (SES) may have yielded different results. Further research is clearly needed to examine this issue further.

The study by Pisa et al[5] reported data from 2010 on apparently healthy participants 35 years or older in the South African sub-study of the 12 year international Prospective Urban and Rural Epidemiology (PURE) study, also in North West province. Alcohol consumption was assessed by self-report measures from a quantitative food frequency questionnaire (QFFQ), and the biomarkers, percentage carbohydrate deficient transferrin (CDT), and gamma glutamyl transferase (GGT). Consistent with other findings, alcohol consumption was associated with increased HDL-c for both men and women (based on CDT and GGT levels), seemingly supportive of the positive effects of alcohol on HDL-c. However, HDL-c levels of the abstainers, although lower, were still in the normal range, and hence this study did not give a strong case to warrant advocating moderate alcohol consumption as being appreciably superior to abstinence in terms of HDL-outcomes. Moreover, alcohol consumption was associated with increased blood pressure, based on the results for the women (with %CDT), and for both the men and women (with GGT).

The results of the studies need to be interpreted in light of the manner in which alcohol intake was assessed. In terms of the biomarkers, the correlation between CDT and GGT levels was found to be low.[5] The GGT levels were found to be associated with self-reported drinking among females in the THUSA studies. One of the earliest studies to measure CDT in southern Africa involved male and female

adults in a rural community in Lesotho.[6] Rather than %CDT, total CDT was measured. It was found to have a high specificity amongst both males and females (80%), but very low sensitivity. In addition, 20% of the women who reported never drinking alcohol had elevated CDT levels, pointing to its limitations as a measure of alcohol intake. Further research is therefore needed to continue examining the specificity and sensitivity of these measures in South Africa, and improved biomarkers may need to be developed.

The studies in this SAJCN supplement also highlighted difficulties regarding how to estimate daily consumption, based on self-reports in surveys. Of particular difficulty is the estimation of alcohol intake amongst those involved in communal drinking and consumption of non-commercially brewed alcohol. Without a clear understanding of the alcohol content of non-commercial beverages, which come in different forms[7] and can vary in alcohol concentration, the calculations of g/day of alcohol intake for communal drinkers of home brewed beverages can be somewhat unreliable. Also, the period of time the participants were asked to consider when reporting on their drinking is not clear from the research papers. Answers to questions concerning consumption during a particular time period can vary depending on the day of the week on which the questions are asked, particularly given that, in South Africa, levels of alcohol consumption are far higher during the weekend.[8]

The gender differences in findings are also noteworthy, particularly as females are increasingly becoming involved in the consumption of alcohol in many developing countries. The description of female drinking in Setlalentoa's social aspects article is based on a paper published in 1994 concerning females in Lesotho, and may be less relevant today.[9] The cultural mores that once protected women against alcohol abuse seem to now have less of an influence. The earlier THUSA studies described in this series showed low levels of drinking amongst women (as their mean daily intake did not exceed the recommended 15 g per day), while the later PURE study which was conducted in 2005[5] found that women (and the men) were drinking at problematic levels, with their mean daily intake being 23.3 g per day. Gender differences in the health outcomes associated with alcohol use are worth exploring further.

The effects of different alcohol beverage types on health and nutritional outcomes are also worth examining, as acknowledged in the various papers. For South Africa and other countries within the sub-region, particularly in rural areas, non-commercial beverages constitute a significant portion of all beverages consumed.[10] More research is also needed to examine the constituents of home-brewed beverages, their effects on health, and the likely recommendations that can be made regarding the consumption of such beverages.

The papers in this edition of the South African Journal of Clinical Nutrition provide useful information regarding the drinking guidelines for South Africa.[11] A possible cardioprotective effect of alcohol consumption that is implied from the results concerning levels of HDL-c, are minimised by the negative effects of alcohol on blood pressure. Indications that drinkers have elevated risk of positive iron imbalance are also revealed. It is likely to be premature and inadvisable to promote moderate drinking to abstainers, since abstainers already had high levels of HDL-c. Also, it may be inadvisable to encourage moderate drinking among those who do not drink, if one considers the possibility of the development of an alcohol use disorder amongst current abstainers. From the papers in this series, and in the absence of consistent conclusive local data in South Africa, it would be premature to promote moderate drinking for non-drinkers in South Africa.

Morojele N

Chief Specialist Scientist, Alcohol and Drug Abuse Research Unit, Medical Research Council, Pretoria
Correspondence to: Neo Morojele,
e-mail: Neo.Morojele@mrc.ac.za

References

1. Setlalentoa BM, Pisa PT, Thekisho GN, et al. The social aspects of alcohol misuse/abuse in South Africa. S Afr J Clin Nutr. 2010;23(2)(Supplement 1):S11-S15.

2. Pisa PT, Loots Du T, Nienaber C. Alcohol metabolism and health hazards associated with alcohol abuse in a South African context: a review. S Afr J Clin Nutr. 2010;23(2)(Supplement 1):S4-S10.

3. Gopane RE, Pisa PT, Vorster HH, et al. Relationships of alcohol intake with biological health outcomes in an African population in transition: the Transition and Health during Urbanisation in South Africa (THUSA) study. S Afr J Clin Nutr. 2010;23(2)(Supplement 1):S16-S21.

4. Serfontein M, Venter C, Kruger A, et al. Alcohol intake and micronutrient density in a population in transition: the Transition and Health during Urbanisation in South Africa (THUSA) study. S Afr J Clin Nutr. 2010;23(2)(Supplment 1):S22-S28.

5. Pisa PT, Kruger A, Vorster HH, et al. Alcohol consumption and cardiovascular disease risk in an African population in transition: the Prospective Urban and Rural Epidemiology (PURE) study. S Afr J Clin Nutr. 2010;23(2)(Supplement 1):S29-S37.

6. Siegfried N, Parry CDH, Morojele NK, Wason D. Profile of drinking behaviour and comparison of selfreport with the CAGE and CDT in a rural Lesotho community. Alcohol and Alcoholism. 2001;36:243–248.

7. Pitso JMN. Field tales of hazardous home brewed alcoholic beverages: the case of Selebi Phikwe. Afr J Drug Alcohol Studies. 2007;6(2):89–103.

8. Parry CDH, Pluddemann A, Steyn K, et al. Alcohol use in South Africa: findings from the First Demographic and Health Survey. J Studies Alcohol. 2005;66:91–97.

9. Mphi M. Female alcoholism problems in Lesotho. Addiction. 1994;89:945–949.

10. World Health Organization. Global Status Report on Alcohol. Geneva: WHO, 2004.

11. Van Heerden IV, Parry CDH. If you drink alcohol, drink sensibly. S Afr J Clin Nutr. 2001;14(3):S71–S77.