

EDITORIAL

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Allergic and asthmatic reactions to alcoholic drinks: a significant problem in the community

H. Vally

National Centre for Epidemiology and Population Health, ANU College of Medicine and Health Sciences, The Australian National University, Canberra, ACT, Australia

The effects of alcoholic drink consumption on health are complex. At low to moderate levels of consumption, alcoholic drinks may have beneficial effects, with a reduction in the risk of cardiovascular disease being well described [1, 2]. In contrast, higher levels of alcohol consumption are clearly detrimental to health, increasing the risk of liver disease, hyper-tension, stroke and certain cancers [3]. Adding to the complexity is the fact that some health effects have been specifically attributed to alcohol itself (ethanol), while others are thought to be due to one or more of the large number of non-alcohol components that give these drinks their unique flavour and character [4, 5].

Similar challenges are apparent when we narrow our focus to the relationship between alcoholic drinks and allergic disease. Firstly, alcohol is a potent immunomodulatory drug, and there is some evidence that consumption of alcoholic drinks may play a role in the development of allergic disease itself, although the extent of this role remains unclear, and requires further study [6–8]. In contrast, in those who already have underlying allergic disease or asthma, anecdotal and self-reported data clearly suggest that alcoholic drinks can trigger symptoms in susceptible individuals [9]. Alcohol itself is responsible for this sensitivity in some individuals, causing a classical facial flushing response (along with a number of other symptoms, including bronchoconstriction) within 30 min of consumption in up to 50% of subjects of Asian ethnicity, due to genetic variation in the enzyme aldehyde dehydrogenase [10, 11]. Less well understood, however, are sensitivities to the non-alcohol components of alcoholic drinks, although their existence is supported by the fact that many individuals report sensitivities only to particular types of drink and can tolerate others with

impunity (independent of their alcohol content). For example, many individuals report sensitivities to wine, but not to beer or spirits. Intriguingly, in recruiting subjects for wine challenge studies we have encountered many who report sensitivities that are even more idiosyncratic, with responses only to specific brands of drink, while tolerating others.

Data from the United Kingdom in the early 1980s were the first to highlight the extent of self-reported allergic and asthmatic responses to alcoholic drinks [9]. A survey of outpatients in London indicated a frequency of alcoholic drink-induced asthmatic responses of 32.1%. In a subsequent Australian community-based survey of asthmatic patients, over 40% of respondents reported allergic or *allergic-like* symptoms following alcoholic drink consumption, with 33.1% specifically reporting asthmatic responses [12]. In both studies, these reactions were predominantly to more chemically complex drinks, with wine being identified as the major trigger by approximately 30% of respondents. Various permutations of sensitivity to wine were reported in the Australian study, with some reporting sensitivities only to red wine, some only to white wine, while others were sensitive to both varieties of wine [12]. Although the characteristics of these responses varied, they were mostly rapid in onset, generally manifesting in less than 1 h, and were of mild to moderate severity.

Despite these interesting findings, the weakness of these previous surveys was that they were conducted in highly selected populations of asthmatics, and therefore did not provide an estimate of the true prevalence of alcoholic drink sensitivities in the community. The study by Linneberg et al. [13] in this issue of *Clinical and Experimental Allergy* represents an important advance in our understanding of the true prevalence of these sensitivities, as it is the first time that the prevalence of adverse responses to alcoholic drinks in both the lower and the upper airways has been assessed in a representative community survey. As might have been predicted, the estimated prevalences in this study were lower than those reported from previous

Correspondence:

Dr Hassan Vally, National Centre for Epidemiology and Population Health, ANU College of Medicine and Health Sciences, The Australian National University, Canberra, ACT 0200, Australia.
E-mail: Hassan.Vally@anu.edu.au

surveys of asthmatic patients; nevertheless, the prevalence of alcoholic drink sensitivities was still surprisingly high, with 13.9% of community respondents reporting adverse reactions in the upper airways, lower airways or skin. Once again, it was confirmed that all varieties of alcoholic drink trigger these responses, with red wine being the most frequent. However, it is interesting that contrary to earlier findings [12], spirits were found to be as frequent a trigger of lower airway symptoms as red wine. It is also noteworthy that among the asthmatic subjects surveyed in this study, 17.5% reported the triggering of upper airway symptoms and 12.9% reported lower airway symptoms, supporting the notion that sensitivities to alcoholic drinks are a significant problem among the broader asthmatic community.

The variety and idiosyncratic nature of reactions to alcoholic drinks are consistent with there being no single underlying mechanism. While IgE-mediated sensitivities have been implicated [14–16], these appear to be the exception rather than the rule. In the main, alcoholic drink sensitivities appear to be intolerance-type reactions with little evidence for the involvement of the immune system. Although numerous components of alcoholic drinks, including the sulphite additives [12, 17] and histamine [18, 19], have been suggested to play a role in these responses, studies addressing the potential mechanisms of these sensitivities have often been inconclusive and thus identification of the specific components responsible for sensitivities has remained largely elusive. One possibility is that unidentified components of these drinks may be playing an important role in these responses. Another is that the aetiology of these sensitivities may be complex and multifactorial, with factors such as asthma stability and the presence of other triggers or irritants in the environment possibly playing a role in individual reactions [17, 18]. Other factors that may contribute include the temperature and acidity of wine or the rate at which it is consumed. Even stimuli such as talking and laughing may play a role. Clearly, in order to unravel such a potentially complex aetiology, it will be necessary to design more sophisticated challenge studies that do not simply rely on changes in the forced expiratory volume in 1 s (FEV₁) for the detection of reactivity to alcoholic drinks. Recently, the possibility of detecting wine sensitivity by measuring changes in bronchial hyper-reactivity (BHR) was assessed, and while changes in BHR in the absence of changes in FEV₁ were observed in some individuals following wine challenge, interpretation of the findings proved difficult [20]. Measurement of changes in biomarkers following wine challenge is another potentially promising avenue that warrants further exploration.

Clearly, a better understanding of allergic and asthmatic reactions to alcoholic drinks is important, given the widespread consumption of these drinks and the confir-

mation provided by the study of Linneberg et al. [13] in this issue of the journal that self-reporting of such sensitivities is relatively frequent in the community. While the burden of disease of asthma is well appreciated, there has recently been increased recognition of the impact of allergic rhinitis on quality of life [21], and thus the importance of the confirmation by Linneberg et al. [13] of earlier findings that alcoholic drinks also frequently trigger allergic rhinitis symptoms [22] should not be underestimated. The challenges that now remain are to clarify the specific components of these drinks that are responsible and to elucidate the pathophysiological mechanisms that underlie these sensitivities. Further research in this area is important, given that the identification and avoidance of triggers are fundamental to the clinical management of allergic and asthmatic disease, and for the insights it may provide into the pathophysiology of these diseases. In addition, the identification of particular components in alcoholic drinks that trigger adverse responses may facilitate the formulation of 'non-allergenic' alcoholic drinks and appropriate labelling of drinks that contain high levels of offending substances. Certainly, the production of *sulphite-free* wines has made a difference to asthmatics who are sensitive to this chemical, allowing them to enjoy these drinks safely. As is the case with other food sensitivities, complete avoidance of all alcoholic drinks by all susceptible individuals is not what is prescribed. Rather, both patients and physicians should be aware that the maxim that 'one man's food is another man's poison' also extends to alcoholic drinks and allergic disease, and that if specific alcoholic drinks trigger adverse reactions, then the sensible course of action for most individuals is to identify and substitute these with safe alternatives.

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