

Alcohol allergy

In contrast to flushing, irritant and toxic reactions to alcohol, allergic reactions to alcohol are relatively uncommon. In people with alcohol allergy, as little as 1 ml of pure alcohol (equivalent to 10ml of wine or a mouthful of beer) is enough to provoke severe rashes, difficulty breathing, stomach cramps or collapse. Alcohol can also increase the likelihood of severe allergic reactions (anaphylaxis) from other causes like food.

Allergy tests to alcohol are usually negative

The human body constantly produces small amounts of alcohol itself. Normal levels of 0.01 to 0.03 mg of alcohol/100 ml are contained in the blood. By contrast, a blood alcohol limit for driving of 0.05 per cent is equal to around 50 mg of alcohol/100 ml of blood. Since the human body produces alcohol itself, the reasons why some individuals develop allergic reactions when they drink alcohol is curious. Allergy tests using alcohol are usually negative, but are sometimes positive to breakdown products of ethanol such as acetaldehyde or acetic acid (vinegar).

Flushing is not an allergic reaction

Some people develop severe facial flushing if they drink small amounts of alcohol. This is not an allergic reaction and is most common in those with an Asian background. Other side effects may also occur, including fluttering of the heart (palpitations), feeling hot, headache, tummy discomfort or a drop in blood pressure. These may be related to high blood acetaldehyde levels. Not all flushing is due to alcohol. Flushing can occur in skin conditions like rosacea, menopause, low blood sugar levels (hypoglycaemia), or as a response to some antibiotics or medicines used to treat diabetes or high blood fat levels.

Alcoholic beverages contain ethanol and other substances

The liver breaks down the alcohol (ethanol) that we drink and converts it to a chemical called acetaldehyde. Acetaldehyde is then transformed to acetic acid (vinegar). Problems occur if alcohol cannot be broken down. As well as ethanol, alcoholic beverages contain a complex mixture of grape, yeast, hop, barley or wheat derived substances, natural food chemicals (such as salicylates) and wood derived substances or preservatives like sodium metabisulfite. Severe allergic reactions have been described in people with allergies to proteins within grapes, yeast, hops, barley and wheat. These people are not sensitive to alcohol itself. Furthermore, fining agents (such as egg or seafood proteins) are sometimes used to remove fine particles. Whether these occur in sufficient amounts to trigger allergic reactions is unknown.

Asthmatic reactions may occur due to metabisulfite

Up to a third of people with asthma complain that wine will worsen their asthma, and as often with beer or spirits. Beer, wine and champagne contain sodium metabisulfite (additive 220, 221) which has been used as a preservative since Roman times. Some people, particularly those with unstable or poorly controlled asthma, may wheeze when they consume these drinks. In general, there is more preservative in white wine than red wine, and more in cask wine than bottled wine. The amount of metabisulfite also varies from brand to brand. Some low sulfite wines are available, although those with extreme sensitivity may not be able to tolerate them. This is because some grape growers will dust sulfur powder over grapes in the weeks leading up to harvest.

Other sources of metabisulfite include vinegar, pickled onions, dried fruit, crustaceans, some restaurant salads and fruit salads. Even when people complain that wine triggers asthma, metabisulfite may not be the only explanation. Further information on Sulfite allergy is available on the ASCIA website:

www.allergy.org.au/patients/product-allergy/sulfite-allergy

Asthma can also be due to enzyme deficiency

People low levels of aldehyde dehydrogenase may accumulate high levels of acetaldehyde after drinking alcohol, as they cannot break it down easily. Acetaldehyde has been blamed for asthmatic reactions to alcohol in up to half of Japanese people with asthma.

Histamine and other substances may also cause problems

Histamine can trigger sneezing, runny nose and sometimes wheeze, stomach upset and headache. Although the actual amounts vary between different wines, in general there is more histamine in red than white wines and more in Shiraz than Cabernet. Some challenge studies suggest that antihistamines may reduce the severity of problems after wine, but as the challenges were equivalent to only one glass, these medicines probably won't prevent a hangover! Other substances in wine may also cause problems to some individuals, but these are not well defined.

The presence of alcohol may not always be obvious

There are many less obvious sources of alcohol in our diet. These include alcoholic soft drinks, mixes, spiked drinks, food marinades or tomato puree. Over ripe fruit can ferment, resulting in enough alcohol production to trigger a reaction. Some medicines like cough syrups and some injected medicines also contain alcohol to help them dissolve and stay in liquid form.

Management of alcohol allergy

Accidental exposure to alcohol may lead to unexpected reactions. Severe alcohol allergy should be managed in the same way as other severe allergic reactions (anaphylaxis): identify and avoid the cause, wear a medical identification bracelet, and carry adrenaline (epinephrine) as part of an emergency action plan if they are at risk of potentially life threatening allergic reactions in the future. Further information on anaphylaxis is available on the ASCIA website: www.allergy.org.au/patients/about-allergy/anaphylaxis

Milder reactions to alcohol may also occur

Alcohol sometimes worsens symptoms in people with hives (urticaria) and occasionally alcohol can also trigger hives. As with more serious allergic reactions, the mechanism is unclear. Contact rashes from alcohol are very uncommon.

Not all adverse reactions to alcohol are due to allergy

Other effects of alcohol toxicity are well known, including its effect on the liver, stomach, brain and mental functioning when consumed in large amounts. Even though alcohol has a relaxant effect on the brain, some individuals will experience agitation and anxiety and these symptoms are due to the drug like activity of alcohol. These reactions do not represent allergy any more than a hangover does.

References

1. Ayres, J. G. and D. Allsopp. Fungal growth on wine corks--a potential source of exposure to susceptible individuals. *Clin Exp Allergy* 1994; 24(12): 1179-80.
2. Boehncke W-H, Gall H. Ethanol metabolite acetic acid as causative agent for type-I hypersensitivity-like reactions to alcoholic beverages. *Clin Exp Allergy* 1996; 26: 1089-91.
3. Bonadonna, P., M. Crivellaro, et al. Beer-induced anaphylaxis due to barley sensitization: two case reports." *J Investig Allergol Clin Immunol* 1999; 9(4): 268-70.
4. Clayton, D. E. and W. Busse. Anaphylaxis to wine. *Clin Allergy* 1980; 10(3): 341-3.
5. Curioni A et al. Urticaria from beer: an immediate hypersensitivity reaction due to a 10kDa protein derived from barley. *Clin Exp Allergy* 1999; 29: 407-13.
6. Dahl, R., J. M. Henriksen, et al. Red wine asthma: a controlled challenge study. *J Allergy Clin Immunol* 1986; 78(6): 1126-9.
7. Dalton-Bunnow, M. F. Review of sulfite sensitivity. *Am J Hosp Pharm* 1985; 42(10): 2220-6.
8. Ehlers, I., U. C. Hipler, et al. Ethanol as a cause of hypersensitivity reactions to alcoholic beverages. *Clin Exp Allergy* 2002; 32(8): 1231-5.
9. Garcia-Casado, G., J. F. Crespo, et al. Isolation and characterization of barley lipid transfer protein and protein Z as beer allergens. *J Allergy Clin Immunol* 2001; 108(4): 647-9.
10. Garcia-Robaina, J. C., F. de la Torre-Morin, et al. Anaphylaxis induced by exercise and wine. *Allergy* 2001; 56(4): 357-8.
11. Harada S et al. Aldehyde dehydrogenase deficiency as cause of facial flushing reaction to alcohol in Japanese. *Lancet* 1981; 982.
12. Kelso, J. M., M. U. Keating, et al. Anaphylactoid reaction to ethanol. *Ann Allergy* 1990 64(5): 452-4.
13. Kochumian, A. A., R. R. Bedzhieva, et al. 3 cases of death in bronchial asthma patients after consuming alcoholic beverages. *Ter Arkh* 1987; 59(1): 110-1.
14. Mallon, D. F. and C. H. Katelaris. Ethanol-induced anaphylaxis following ingestion of overripe rock melon, *Cucumis melo*. *Ann Allergy Asthma Immunol* 1997; 78(3): 285-6.
15. Ormerod AD, Holt PJA. Acute urticaria due to alcohol. *Br J Dermatol* 1983; 108: 723-4.
16. Castorello EA et al. Identification of grape and wine allergens as an Endochitinase 4, a lipid-transfer protein, and a Thaumatin. *J Allergy Clin Immunol* 2003; 111: 350-9.
17. Przybilla B, Ring J. Anaphylaxis to ethanol and sensitization to acetic acid. *Lancet* 1983; 483.
18. Sticherling, M. and J. Brasch. Alcohol: intolerance syndromes, urticarial and anaphylactoid reactions. *Clin Dermatol* 1999; 17(4): 417-22.
19. Ting, S. Anaphylactoid reaction to ethanol. *Ann Allergy* 1992; 69(5): 463.
20. Vally, H., A. Carr, et al. Wine-induced asthma: a placebo-controlled assessment of its pathogenesis. *J Allergy Clin Immunol* 1999; 103(1 Pt 1): 41-6.
21. Vally, H., N. de Klerk, et al. Alcoholic drinks: important triggers for asthma. *J Allergy Clin Immunol* 2000; 105(3):462-7.
22. Vally, H. and P. J. Thompson (2001). Role of sulfite additives in wine induced asthma: single dose and cumulative dose studies. *Thorax* 56(10): 763-9.
23. Wantke, F., M. Gotz, et al. The red wine provocation test: intolerance to histamine as a model for food intolerance. *Allergy Proc* 1994; 15(1): 27-32.
24. Wantke, F., W. Hemmer, et al. Histamine in wine. Bronchoconstriction after a double-blind placebo-controlled red wine provocation test. *Int Arch Allergy Immunol* 1996; 110(4): 397-400.
25. Vally H, Thompson PJ. Alcoholic drinks and asthma (Review). *Clin Exp Allergy* 2002; 32: 186-91.

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