

Diagnosis and Management of Wine Induced Asthma: A Case Report

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Abstract

Wine appears to be a significant trigger for asthma in some individuals. Sulphite additives have been implicated as a major cause of wine induced asthma, but it lacks direct evidence. Here, a 39 years old male presented with clinical symptoms of bronchial asthma, multiple sneezing, followed by watery nasal discharge associated with symptoms such as, nausea, vomiting and breathlessness immediately after exposure with wine or cold beer. The patient showed positive skin prick test against few fungal extracts may be due to cross reactions. The diagnosis was established by single blind challenge test with red wine. The patient had a significant fall in forced expiratory volume in one second (FEV1) (> 23% from baseline) following the challenge test with wine. The patient was advised to avoid alcohol containing drinks and he did not develop any symptoms of asthma or rhinitis for more than 6 years. The avoidance strategy seems suitable for successful management of wine induced asthma.

Keywords: Alcohol, Asthma, Forced expiratory volume in one second, Skin prick test, Single blind challenge test

INTRODUCTION

Alcoholic drinks are one of the important triggers for asthma¹. A survey of more than 300 patients confirmed anecdotal reports linking alcoholic drinks with asthma symptoms². Many persons with asthma report wine as a trigger for worsening asthma symptoms, however little is known about the pathogenesis of these reactions. Some individuals report reactions to red wine only, others to white wine only whereas some with both red and white wines.

There are certain individuals that experience reactions with only specific types or brands of wine. The mechanisms of these reactions is rather complicated by the fact that these drinks contain hundreds of components derived from the grapevine, yeast, and bacteria and from chemicals added during the processing³. Wine also contains many contaminants such as hymenoptera insects and microbes that fall into the wine when grapes are collected and processed for wine formation. Despite these confounding factors, the sulfites family of food additives have been implicated in the pathogenesis of wine-induced asthmatic reactions⁴. Sulfites are produced by yeast during fermentation and are also added exogenously during manufacture to prevent microbial spoilage and oxidation of these drinks⁵.

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CASE REPORT

A thirty-nine year male with stable asthma attended the Out Patient Department of V. P. Chest Institute, Delhi. During the previous 6-7 years, he had developed many episodes of multiple sneezing followed by repeated watery nasal discharge immediately after intake of wine or beer. This was associated with generalized itching, maculopapular rash, and flushing. Since three years before consultation, he experienced bronchial asthma associated with breathlessness and wheezing. Later, the subject reported a history of repeated episodes of worsening asthma symptoms within 1 hour of wine consumption. His family history showed that his father and grandfather were having asthma. Clinical details of asthma were recorded and allergen skin prick tests were performed with a range of common allergens. The baseline lung function tests had results within the range of normality, with a positive bronchodilator test.

MATERIALS AND METHODS

The initial investigations included hemogram, total leucocyte count (TLC), differential leucocyte count (DLC), stool for ova and cyst, chest radiogram, and spirometry with reversibility. Skin prick tests were done using a battery of common allergens at V. P. Chest Institute, Delhi.

Oral Challenge

Single-blind wine challenge test: Subject was instructed to eat a light meal 2 hours before challenge and to abstain from all alcoholic beverages for at least 48 hours. The use of medications was also restricted before each challenge. Short-acting beta-2-agonists were restricted for 8 hours; cromolyn/nedocromil, inhaled steroids, and anticholinergics were restricted for 12 hours; long-acting beta-2-agonists and short-acting antihistamines were restricted for 24 hours and theophylline was restricted for 3 days before the challenge. Baseline FEV1 was assessed at the beginning and was required to be within 10% of the baseline FEV1 at the entry level into the study. Lung function measurements were then taken at 30 and 90 seconds after wine challenge. The best of 3 measurements were recorded for each time point. A fall in FEV1 > 20% from pre-challenge values was determined as a

positive response to challenge in the individual. A fall in FEV1 of more than 20% resulted in the mandatory withdrawal of the patient and the administration of appropriate bronchodilation therapy.

RESULTS

The general laboratory work-up, the plain chest film and the X-ray of the paranasal sinuses were normal. Routine blood investigation did not reveal any abnormality in WBC counts except his eosinophil count, that was around 12% with a slight increase in erythrocyte sedimentation rate (15 mm/h). Skin tests with inhalant and other allergens evidenced marked positive reaction with *Cladosporium herbarum*. The baseline lung function tests had results within the range of normality, with a positive bronchodilator response (Table 1).

Single-blind wine challenge

A single-blind challenge test was done to assess the effect of wine consumption on airway narrowing. The challenge involved the steady ingestion of 75 mL of the alcoholic drink (red wine) over a period of 5 minutes at room temperature. The patient was subjected to spirometry within 30 and 90 secs and showed no significant difference in the maximum fall in forced vital capacity (FVC). However, a maximal fall of FEV1 by more than 23% (from baseline) and more than 51% fall (from baseline) was recorded in forced expiratory flow and mid expiratory flow (FEF₂₅₋₂₅), respectively (Table 2).

The patient was advised to avoid alcohol containing drinks especially wine. By avoiding wine, he did not develop any symptoms of asthma or rhinitis for more than 6 years.

DISCUSSION

The effect of alcoholic drinks on a number of health outcomes is well documented^{6,7}. But, there is little information on the effect of alcoholic drinks on asthma. In this case report, wine was perceived by a patient as a trigger factor for his asthma. Here wine was used to assess the potential sensitivity of this patient in a single blind manner. The response was very rapid in onset, occurring within minutes, and was

moderate in severity. Using three measures of airway narrowing (FEV1, FVC and FEF₂₅₋₇₅), we could demonstrate a significant decline in the lung function parameters of patient in response to challenge with wine. Alcoholic drinks especially wine contains many contaminants. One such component is histamine, which is present in red wines to a much higher degree than in white wine, and is a potent mediator of allergic responses⁸. The ingested histamine has been shown to play a role in intolerance and asthmatic reactions to wines in susceptible individuals^{8,9}, however the extent of this is not clear. Whether histamine played a role in this specific patient is not well defined. Plasma levels of histamine in intolerant individuals peaks between 20 to 30 minutes after a challenge and therefore symptoms initiated by this mediator would be expected to follow a similar time course⁹.

Up to a third of the people with asthma complain that exposure to wine can worsen their asthma symptoms, less often with beer or spirits. Beer, wine and champagne contain sulphites (additive 220-226), used as a preservative since Roman times. In one such study², 32.1% of asthmatics reported worsening of asthma symptoms after alcohol consumption². In another study, wine was the main cause of asthmatic symptoms, with 30.3% of respondents reporting

reactions to this drink¹⁰. 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 metabisulphite also varies from brand to brand. Some "low sulphite" wines are available, although those with extreme sensitivity may not be able to tolerate them. Sensitivity to sulfite additives in wine seems to play an important role in many of these reactions.

Previous studies suggest that consumption of alcoholic drinks trigger symptoms of asthma or rhinitis in 32.1% population surveyed². Here in the present case study, the patient showed positive reaction on oral blinded challenge with red wine. He was advised not to take alcoholic drink. By avoiding wine, he did not develop any symptoms of asthma for more than 6 years. The underlying mechanism of wine induced asthma is not clearly understood as it contains many contaminants alongwith other food additives. The major food additive is sulphites that may trigger the asthmatic responses. It is important to create awareness among patients that alcoholic drinks are potential asthma triggers and avoidance will prevent asthma exacerbations.

Table 1. Results of baseline lung function test

Spirometry	Observed		Observed		Percent change
	Pre	% Pred	Post	% Pred	
FVC (L)	3.73	89	3.74	90	+0
FEV1(L)	2.78	79	3.03	87	+9
FEF ₂₅₋₇₅ (L/sec)	2.13	58	2.84	78	+29

Table 2.. Maximal fall in FVC, FEV land FEF₂₅₋₇₅ after wine challenge

Spirometry	Observed		Observed		Percent change
	Pre	% Pred	Post	% Pred	
FVC (L)	3.79	94	3.62	90	-4
FEV1(L)	3.00	89	2.30	68	-23
FEF ₂₅₋₇₅ (L/sec)	2.69	73	1.31	35	-51

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