

A dietary free from additives in the management of allergic disease

B. J. FREEDMAN

King's College Hospital, London

Summary

Some patients who suffer from asthma, rhinitis or urticaria undergo exacerbation of symptoms following ingestion of foods or beverages containing azo dyes, sulphur dioxide or benzoates, which are used as preservatives. These patients may be mistakenly thought to be suffering from specific food allergies. A dietary is presented which is free from these additives. Drugs and their coatings and capsules may also contain azo dyes and these should be avoided by patients on an additive-free diet. Four cases are reported illustrating recovery, one from asthma and three from chronic urticaria after commencing this diet.

Introduction

Various artificial dyes are used in foods, beverages and drugs. Those most commonly used are the azo dyes tartrazine (orange), sunset yellow (yellow), amaranth and new coccine (both red), and the non-azo dye patent blue. The most commonly used preservatives in food are sulphur dioxide, sodium benzoate, and 4-hydroxybenzoate esters. These drugs and preservatives are harmless to the great majority of the population. A minority of allergic subjects develop asthma, rhinitis or urticaria soon after ingesting them. The role of tartrazine in inducing asthma in sensitive subjects has been documented by Lockey (1959), Chaffee & Settupane (1967), Samter & Beers (1968), Juhlin, Michaëlsson & Zetterström (1972), Rosenhall & Zetterström (1973) and Stenius & Lemola (1976), while Michaëlsson & Juhlin (1973) have also implicated sunset yellow and new coccine in urticaria. Benzoates have been reported to cause asthma and urticaria by Chaffee & Settupane (1967), Juhlin *et al.* (1972), Rosenhall & Zetterström (1973) and Michaëlsson & Juhlin (1973). Sulphur dioxide has been reported to cause asthma by Freedman (1977).

The number of foods and beverages containing dyes and preservatives must amount to hundreds, possibly thousands (The Preservatives in Food Regulations, 1975). Warin & Smith (1976) have drawn up a battery of challenge tests for the investigation of chronic urticaria. However, a knowledge of what additives may provoke

Correspondence: Dr Bernard J. Freedman, King's College Hospital, Denmark Hill, London SE5 9RS.

reactions imposes a heavy burden on the individual patient owing to the ubiquity of food additives. A comprehensive list of these foods for the purposes of avoidance by sensitive subjects would be unwieldy and impracticable. It is simpler for the patient and time-saving for the physician to give the patient details of a diet known to be free from additives. This has been done by Michaëlsson & Juhlin (1973), and by Stenius (1976), whose dietaries are suited to foods available in Scandinavia. The purpose of this article is to present a dietary which is adapted for this purpose to British food Regulations, to availability of foods and to eating habits in Britain. It lists a range of permitted foods and beverages from which a palatable and wholesome diet may be drawn up. Forbidden foods are mentioned only where doubt may arise. Certain fresh fruits have been labelled with a 'caution', since they may naturally contain salicylates and allied substances. The following diet list is handed to patients following discussion of its contents.

DIET FOR SENSITIVITY, KNOWN OR SUSPECTED, TO ARTIFICIAL FOOD COLOURS AND PRESERVATIVES

Advice to patients

The following list comprises permitted foods and beverages, and only these may be taken. Forbidden foods are mentioned only where it is necessary to clarify an uncertain choice. Read the small print on packets and plastic bags. If it says 'permitted artificial colours', preservatives, sulphur dioxide or sodium benzoate, then the contents are forbidden. The terms 'frozen' and 'bottled' in this list refer to commercial products, not to food prepared at home. If what you want is not in this list, it is forbidden.

Permitted diet list

Category	Comments
Cereals etc.	Wheat, semolina, rye, oats, barley, maize (corn, sweetcorn), buckwheat, rice and millet; sago and tapioca.
Breakfast cereals	Avoid unless you have checked statement of comments on container.*
Flour	Wheat, oats, maize (corn-flour), potato, rice. <i>Not</i> special mixes which may contain dyes.
Bread	Wheat, rye. <i>Not</i> cakes and biscuits unless home-made.
'Ryvita'	—
Peek Frean's 'Vita-weat'	—
Rye crispbread	—
Pasta	Spaghetti, macaroni, vermicelli and others. <i>Not</i> if coloured.
Vegetables	Fresh, frozen, dried. <i>Not</i> canned or bottled.
Fruit	Fresh or dried. <i>Not</i> frozen, canned or bottled. <i>Caution</i> , some dried fruits in plastic bags contain sulphur dioxide. <i>Caution</i> with some fresh fruits: apples, grapes, bananas, rhubarb.
Milk	Fresh, 'long life' (UHT), dried milk powder, yoghurt. <i>Not</i> coloured or flavoured yoghurt.
Cheese	British white cheese. <i>Not</i> continental cheeses.
Butter	Fresh. <i>Not</i> margarine.
Cream	Fresh.

Meat	Fresh, frozen, salted. <i>Not</i> sausages, luncheon meat, canned or otherwise processed.
Poultry	—
Eggs	—
Fish	Fresh, frozen, salted, pickled. <i>Not</i> smoked or canned. <i>Not</i> fish cakes or balls unless made at home. <i>Not</i> fried in coloured breadcrumbs.
Soups	Made from permitted ingredients. <i>Not</i> packet or canned soups.
Sugar, honey, home-made jam and marmalade.	<i>Not</i> sweets unless home-made without added colour.
Salt, vinegar	<i>Not</i> salad dressings, salad cream, mayonnaise or sauces, unless made at home from permitted ingredients.
Vegetable oils	Including frying oil.
Drinks	Water, tea, coffee, instant coffee. <i>Not</i> wine, beer, cider, perry or bottled soft drinks. Caution with other alcoholic beverages, which are better avoided.
* Note on breakfast cereals. Some popular permitted examples are listed here. This list is not comprehensive.	
Kellog's	All products except Puffa Puffa Rice.
Lyon's	Ready-Brek oatmeal porridge.
Nabisco	Shredded Wheat, Protein Whispflakes and Shreddies. <i>Not</i> Golden Nuggets.
Sainsbury	All cereals except Swiss Style Breakfast Cereal.
Weetabix	Weetabix. <i>Not</i> Alpen.
Drugs	Some patients who are sensitive to food preservatives and colourings are also sensitive to drugs which may be chemically similar. See notes on 'Drugs to be avoided'.

Many drugs contain azo dyes, and there is some cross-sensitivity between azo dyes, benzoate and aspirin. Accordingly, for the duration of the additive-free diet, the patient should also avoid drugs likely to contain these substances. Guidance to patients is given in the following list.

Drugs to be avoided

Unless the doctor in charge of your case has confirmed that they are safe, avoid the drugs mentioned below. Some of the drugs to be avoided are often mixed with other drugs in compound tablets and sold under proprietary names, so always carefully read the composition on the label or carton, or ask the pharmacist. In this list the name in brackets is the pharmacist's or chemical name which is sometimes used: Aspirin, which is sold under numerous proprietary names, e.g. Aspro, Solprin (acetylsalicylic acid); Indocid (indomethacin); Butazolidin, Butacote, Butazone, Parazolidin, Flexazone (phenylbutazone); Tanderil, Tandalgesic, Tandacote (oxyphenbutazone); Clinoril (sulindac). Paracetamol is comparatively safe and is the most suitable drug for relief of mild pain; in the U.S.A. it is called acetaminophen.

Be on guard when buying drugs without prescription for colds, influenza, rheumatism, arthritis, headache, indigestion or menstrual pains; check the contents.

Avoid coloured capsules, tablets or medicines. White or colourless drugs with equivalent actions are almost certainly available. Some drugs without dyes have a colour of their own; these are all right.

Avoid coloured toothpaste.

Case reports

Female aged 21, medical student. 2 years' history of urticaria occurring almost daily. Confluent lesions up to 15 cm diameter. No other allergic manifestations. Maternal uncle had hay-fever. The history did not disclose any environmental allergens. Skin tests were negative to fifteen common allergens including seven foods. No eosinophilia. Incomplete relief from antihistamines. Urticaria ceased after commencing the additive-free diet and has not recurred during 12 months' observation. There was one brief relapse when she underwent minor surgery and took a hospital diet.

Male aged 58, manager of a hops showroom. Intrinsic asthma and rhinitis of 20 years' duration. Sensitive to aspirin, but no other known provocations. Numerous polypectomies and various operations on nose and sinuses. Daughter had asthma and rhinitis. Skin tests negative to fourteen common allergens. No eosinophilia. He has been free from asthmatic symptoms for 8 months since commencing the additive-free diet, and spirometry has shown a corresponding improvement, the forced expiratory volume in 1 sec rising from 1.93 litres to 2.53 litres (predicted = 2.90 litres).

A 36-year-old housewife and laboratory technician gave a 6 years' history of asthma and rhinitis occurring annually from May to July, but these had spontaneously failed to recur during the summer in which she presented with new symptoms. For 2 months she had been troubled by severe generalized urticaria. Bouts of angioedema involving the face and tongue occurred every few days. Exposure to irritant gases in her laboratory were not followed by respiratory or cutaneous symptoms. Her two children had asthma. Skin tests were negative to sixteen common allergens including grass pollen and four foods. A nasal test with grass pollen extract was negative. The FEV₁ was normal. No eosinophilia. She was put on an additive-free diet and the urticaria and angioedema did not recur, except for one relapse which occurred after eating preserved orange peel in a cake. After 3 months she ventured a normal diet with impunity.

A 41-year-old male, director of a printing firm, gave an 18 years' history of rhinitis and nasal polyps, and a 4 years' history of asthma and urticaria. The rhinitis and asthma were improving, but the urticaria was persistent and severe, affecting large confluent areas. There were frequent bouts of angioedema in one of which he nearly succumbed from asphyxia. The history did not disclose any responsible allergens, nor was there any seasonal aggravation. Aspirin had caused facial urticaria and swelling. An uncle, aunt and one son had asthma. Skin tests to eighteen common allergens including eleven foods were negative. No eosinophilia. He was put on an additive-free diet and remained free from urticaria and angioedema during the 8 months of follow-up, except for two transitory relapses which occurred after eating sausage, and after drinking lemonade.

Discussion

Asthma, rhinitis and urticaria following ingestion of foods or beverages may be mediated by immune reactions. An indication of the responsible allergen may be obtained from skin tests, which often give false negatives, and from the radioallergo-sorbent test (RAST) which may give false positives where foods are concerned. Identification of a food allergen is most reliably achieved by an elimination diet followed by provocation by ingestion of the suspected food. This can be a protracted and tedious procedure requiring a high level of co-operation on the part of the patient, which is not always obtainable. Furthermore, results are sometimes paradoxical or

inconsistent. Such inconsistent and puzzling results could be due to an additive which is present in some samples, but not in others, of a particular food. It is logical, therefore, to precede elimination and challenge diets by a trial additive-free diet, which in appropriate cases may solve the clinical problem.

It is worth considering the possibility that food additives may play a role in causing asthma even when patients do not give a history of reaction to foods. Stenius & Lemola (1976) found that 65% of their aspirin sensitive patients and 64% of their tartrazine sensitive patients were unaware of these sensitivities. McDonald, Mathison & Stevenson (1972) and Michaëlsson & Juhlin (1973) reported similar findings. In the four cases reported here there was no history of aggravation of symptoms by foods. Persistent symptoms may be due to continuous exposure to a provocative agent whose relevance is thus not recognised. Further studies are indicated on the effect of an additive-free diet on asthma, rhinitis and urticaria in intrinsic cases, and in extrinsic cases where relapses or persistent symptoms cannot always be explained by exposure to an identified allergen.

Stenius & Lemola (1976) advise that all adult asthmatics should be routinely tested for sensitivity to aspirin and an azo dye. However, since benzoates and sulphur dioxide may also provoke asthma, comprehensive testing could be very time-consuming. The trial of an additive-free diet takes up no more clinical time than is needed to explain its details. Furthermore, if provocation tests to one or more additives are positive, future management will, in any case, require an additive-free diet, since avoidance of specific additives is impracticable owing to their ubiquity.

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