

AN AUSTRALIAN EXCLUSION DIET

ANNE R. GIBSON, B.SC.* AND ROBERT L. CLANCY, PH.D.; F.R.A.C.P., F.R.C.P.†
Royal Prince Alfred Hospital, Sydney

Med. J. Aust., 1978, 1: 290-292.

Exclusion diets may have a practical place in determining of precipitating dietary factors in certain clinical conditions. We present an exclusion diet which is based on the exclusion of food commonly known to cause food allergies, and the exclusion of food which contains salicylates, benzoates, tartrazine, yeast, and penicillin. This provided a basis for challenge with these additives and natural chemicals. Preliminary information in urticaria suggests a use for this diet in some allergic conditions.

MANIPULATION of diet to exclude certain additives and natural chemical substances has become popular in a variety of clinical situations. Although there is little scientific basis for the use of such an exclusion diet for many conditions, there is a belief that the removal of certain additives may be beneficial in some allergic disorders. As part of a study of the pathogenesis and management of chronic urticaria we have successfully modified patients' diets to exclude a group of chemicals which are thought to be precipitating factors.

* Dietician, Department of Dietetics.

† Staff Specialist, Department of Immunology.

Address for reprints: Miss A. R. Gibson, 31 Charlton Avenue, Turramurra, N.S.W. 2074.

Appropriate diets were not readily available, and much of the information which was available was not relevant to Australian conditions, was totally empirical, and hopelessly outdated. We thus constructed a diet relevant to Australian conditions which was based on the most sound analytical data available and which was as nutritious and palatable as possible. Many difficulties were encountered in developing this diet, such as a lack of information on the contents of commercial products. This article is in response to requests from medical practitioners who are unable to obtain a suitable exclusion diet which is relevant to the Australian eating pattern.

EXCLUSION DIET

The aim was to construct a diet which excluded food which caused symptoms (determined by taking a food history), food commonly known to cause food allergies¹ (for example, eggs, fish, seafoods, nuts, peas and beans), and food containing specific substances (salicylates,² benzoates, penicillin, yeast and tartrazine,³) while maintaining the best possible nutrition and patient acceptance.

Basic Diet

1. Meat: Lamb and chicken are used as sources of protein, fat, iron and vitamins. Reported cases of beef-induced urticaria lead to its exclusion.

2. Vegetables: Carrots, lettuce and parsley are free from natural benzoates and salicylates, but contain fibre, water, some vitamins and some minerals. Parsley adds taste and appeal to meals and contains vitamin C. Carrots are a good source of carotene (provitamin A).

3. Fruit: Fresh pears do not contain benzoates or salicylates. They are preserved in cans in a sugar-and-water syrup.

4. Cereals: Matzo, an unleavened crispbread which consists of semolina and water, can be used as a bread substitute (it is used by Jewish people during Passover and is available at most large stores and delicatessens). Semolina is a fine porridge made from hard wheat. Plain wholemeal flour and white flour can be used in batters, thickening and so on. Rice is a suitable potato substitute. Rice bubbles and rice noodles are permitted commercial products which are free from additives. In rice bubbles, the iron and vitamin B content has been restored after processing.

5. Fats: Sunflower, safflower and olive oils are suitable. Avoid butter because it is a possible source of penicillin, and margarine because of the addition of flavouring essences.

6. Miscellaneous: Salt and pepper are the only condiments which are free from natural benzoates and salicylates. Malt vinegar, used in salad dressings, replaces cider vinegar, wine vinegar, or lemon all of which contain salicylates. Gelatine is a protein prepared from collagen which forms a gel with water and provides variety in the diet.

7. Beverages: Instant coffee or percolated coffee can be used. However, tea is prohibited because of salicylate content. All alcoholic beverages and fruit juices contain salicylates.

Absolute Additional Exclusion

All aspirin containing medications (for example, Disprin, Alka-seltzer, or compound analgesics) are prohibited. Similarly excluded are those medications which contain yellow colouring (tartrazine), for example, orange or red tablets. Most flavourings contain salicylates and are found in toothpaste, cough lozenges, flavoured medications and syrups. Oil of wintergreen, a concentrated source of salicylates, is found in creams for muscle soreness (for example, Dencorub, Deep Heat). Perfumes are used to scent all toiletries and contain salicylates and benzoates. Their use often causes skin irritations.

Medications Which are Allowed

Use white, pink or blue antihistamine tablets (that is, avoid yellow and green tablets because of tartrazine in the colouring). For the relief of pain, white codeine tablets are allowed. Savlon antiseptic cream is a permissible germicide which is free from salicylates.

The diet is followed for a period of two weeks. After this time the patients continue the diet,⁴ and are challenged with each test substance, preceded by a placebo. A definitive diet is then planned for the patient which avoids the substances which cause exacerbations under the test conditions. Reassessment at one month, three months and six months enables minor diet modifications when needed. Objective criteria are used; for example, in urticaria, the levels of immune complexes are used to follow the response.

Specific Chemical Factors

Salicylates are present in aspirin, oil of wintergreen and many compound analgesics. They occur naturally in foods, for example, in many fruits and vegetables. Sodium benzoate and 4-hydroxybenzoic acid are preservatives which are used regularly in foods and found as natural constituents of foods. Tartrazine is an approved yellow dye and food colour. Penicillin, which is used by the dairy industry to control infection in herds, is secreted in milk. This has led to the prohibition from this diet of all milk and dairy produce. Yeast is present as a leavening agent in all breads, some baked goods and spreads.

Challenge doses used in this study were as follows.

lactose	(placebo)
tartrazine	10 mg
sodium benzoate	500 mg
4-hydroxybenzoic acid	200 mg
brewers yeast	0.6 g
penicillin	250 mg
aspirin	150 mg
aspirin	300 mg

DISCUSSION

In the past, elimination diets have been used in a number of clinical situations with little rationale. Renewed interest in elimination diets follows apparent clinical benefit in a number of conditions, which probably include very different pathogenic mechanisms. Our own interest developed as part of a study of chronic urticaria, but, when no appropriate diet could be obtained, we developed one applicable to Australian conditions. A number of problems were met.

First, available diets were largely empirical. Our initial aim was to compound a diet which was low in salicylates, benzoates and tartrazine. Tartrazine, a yellow dye which is used widely as a colouring principle, has been implicated by other workers as a cause of chronic urticaria.¹⁻⁶ We have not found this substance to be significant. However, information as to the presence and amount of salicylates and benzoates which occur naturally in food is incomplete, scattered, unorganized and sometimes contradictory. Thus, while the current diet is largely empirical, an effort has been made to exclude foods generally considered to contain these chemicals.¹ Foods known on clinical grounds to contain allergens were added to the "excluded" list.³ Yeast has been shown to be a common precipitant of urticaria⁵ and, therefore, foods which contain yeast were also excluded. Penicillin or penicillin analogues are used in the Australian dairy industry and, as these substances are secreted into the milk, milk and milk products were excluded.

Second, it was difficult to compile a list of commercial products containing salicylates, benzoates, and tartrazine, because of varying production methods of similar foods, poor labelling, lack of knowledge, and varying national standards (for example, the use of preservatives in cheese and coffee in the United States, but not in Australia). Investigation of many commercial products showed that they included added herbs and spices, both of which contain salicylates and benzoates.

It is emphasized that the primary exclusion diet is used for a total of four weeks, and is intended only to identify (i) patients with symptoms which are precipitated by certain chemical factors, and (ii) specific precipitants of the clinical condition, by way of challenge during the second two weeks of the diet. Although several overweight patients have lost weight, the exclusion diet contains adequate protein, fat and carbohydrate, provided that the diet recommendations are followed. Certain nutrients do not meet the level recommended by the Nutrition Committee of the NHMRC. Ascorbic acid level is particularly low because of the limited range of fruits and vegetables. In addition riboflavin, retinol and calcium would fail to meet dietary allowances and thiamine and iron intakes could be marginal. Thus our diet is supplemented with an uncoloured, unflavoured multivitamin tablet.

The clinical improvement provides sufficient motivation to continue the diet in many patients, but the ready availability of the dietitian whom the patient can contact at any time is the cornerstone of management. The dietitian initially takes the food history and then discusses the diet in detail both with the patient and with the person responsible for preparing meals. This allows transfer of practical advice on where to obtain food, how to prepare the food, and how to vary the diet. Several recipes have been developed and have proved most helpful.† The restrictions on lifestyle must not be underestimated, and role of the dietitian in providing support and encouragement is critical to patient confidence. Constant review of the diet has been necessary. Thus pineapple was initially allowed, but

† Recipes are available on request from the Dietitian's Office, Royal Prince Alfred Hospital.

exacerbations occurred in several patients who took large amounts. Similarly, white spaghetti had to be excluded when manufacturers added tartrazine to increase "appeal".

To illustrate the potential value of this diet, we summarize our results in 15 patients with chronic urticaria who have adhered to the diet. Fourteen patients have had remission or marked improvement, and all of these have had a positive response to one or more of the challenges. Eight patients have reacted to salicylate, four to benzoates, and two to penicillin. Follow up of the 14 patients taking a diet modified by the above tests has shown continuing partial remission or complete remission.[§]

It is emphasized that the exclusion diet must be restricted to the evaluation of the role of certain additives and food factors in precipitating clinical conditions (for example, allergic disease, urticaria, hyperactivity and so on) and that carefully supervised controlled trials are needed to establish the place of modified exclusion diets in the management of these conditions. In addition, a more scientific approach to the construction of an exclusion diet is needed, such as a chemical analysis of foods to compile a list which contains the amount of natural salicylates and benzoates in foods, and the education of commercial food companies to determine and make known the nature of additives to their products.

ACKNOWLEDGEMENTS

We thank Miss Maxine Hosking for assistance in compiling the diet, and Miss Josephine Rogers for her helpful comments and discussion during the preparation of this manuscript.

REFERENCES

- ¹ WARIN, R. P. and CHAMPION, R. H., *Urticaria*, W. B. Saunders, Philadelphia, 1974.
- ² WARIN, R. P., The effect of aspirin in chronic urticaria, *Brit. J. Derm.*, 1960, 72: 350.
- ³ MICHAELSSON, G. and JUHLIN, L., Urticaria induced by preservatives and dye additives in food and drugs, *Brit. J. Derm.*, 1973, 88: 525.
- ⁴ WARIN, R. P. and SMITH, R. J., Challenge test battery in chronic urticaria, *Brit. J. Derm.*, 1976, 94: 401.
- ⁵ JAMES, J. and WARIN, R. P., The assessment of the role of *Candida albicans* and food yeast in chronic urticaria, *Brit. J. Derm.*, 1971, 84: 227.
- ⁶ FEINGOLD, B. F., Recognition of food additives as a cause of symptoms of allergy. *Ann. Allergy*, 1968, 26: 309.

APPENDIX Exclusion Diet

Foods allowed

<i>Meat:</i>	Lamb, chicken
<i>Vegetables:</i>	Lettuce, carrots, parsley

[§] Details of the current situation with regard to low salicylate-benzoate diets may be obtained from the Department of Dietetics, Royal Prince Alfred Hospital.

<i>Fruit:</i>	Pears (fresh and canned)
<i>Cereals:</i>	Matzo (biscuits), plain flour, semolina, rice, rice noodles, rice bubbles
<i>Fats:</i>	Oils (for example, olive, safflower, peanut)
<i>Sugars:</i>	Sugar, golden syrup, honey
<i>Miscellaneous:</i>	Malt vinegar, salt, pepper, gelatine
<i>Beverages:</i>	Coffee (instant and ground)
<i>Soups:</i>	Home-made soups using above ingredients
<i>Desserts:</i>	Home-made desserts using above ingredients

Foods not allowed

You must not have any foods or drinks not listed above, that is, no milk, cheese, tea, soft drinks, lollies, chewing gum, butter, margarine, bread, beef, pork or bacon.

Drugs and miscellaneous items to be avoided

1. All medications not prescribed by your doctor, for example, aspirin, Disprin, Alka-seltzer.
2. All medications containing flavouring and colourings.
3. Oil of wintergreen, for example, Dencorub, Deep Heat.
4. Toothpaste is not to be used. Note: A mixture of salt and soda may be used as a substitute or a preparation produced by your chemist or just ordinary salt.
5. Perfumes, for examples, deodorant, soap powder, talcum powder, hair shampoo, make-up and so on. (Unscented, uncoloured Neutrogena or Sunlight laundry soap may be used. Unscented talcum powder may be purchased from some chemists. Clear baby oil may be used.)
6. Cough lozenges and syrup.

Medications which may be used

1. Antihistamines, but only when necessary.
2. White codeine tablets.
3. Savlon antiseptic cream.

Diet Rules

1. Use the food list. Do not use any foods not listed.
2. Do not use any medications not listed.

This diet is to be followed for an initial 14 days, after which time you will be challenged with various compounds and foods containing these compounds.

It is important to keep a diary recording the foods eaten throughout the day. This should be in detail on the forms provided. In the second column, symptoms should be recorded with duration and doses of antihistamines taken.

When the test period is completed, your doctor and dietitian will assess your progress and ascertain the addition of challenge compounds into the basic diet. The challenge compounds should be added one at a time every second day.

If no symptoms occur with a challenge, then continue with the next. But if you do get symptoms wait until they subside, then take the next challenge compound. Take some antihistamine only when necessary. Throughout this period you should continue to follow the diet, keeping a daily record of foods eaten and reaction manifested.