

Elemental diet in the management of severe eczema in childhood

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(Received 21 July 1981; accepted for publication 21 September 1981)

Summary

Eight children with severe, generalized, childhood eczema, uncontrolled by standard dermatological treatment, underwent a period of dietary antigen-avoidance, using an elemental based diet. For the group, there was statistically significant improvement in eczema during treatment with the elemental diet, and relapse of eczema followed within 6 weeks of returning to a normal diet. The results suggest dietary factors are important in childhood eczema.

Introduction

Manipulation and severe restriction of diet has been effective in the prevention and treatment of eczema in the first year of life (Matthew *et al.*, 1977; Juto, Engling & Winberg, 1978). In previous studies of older children with malabsorption due to food allergies, we observed some patients with severe eczema whose malabsorption ceased and eczema healed on treatment with an elemental diet (Hill *et al.*, 1979). In this study we examined the effect of an elemental based diet (Vivonex–Eaton) on very severe childhood eczema, poorly controlled by standard dermatological treatment. This feeding is composed of L-amino acids, glucose polymer, safflower oil, vitamins and minerals.

Patients and methods

Ten children have been studied over a 3 year period. Some clinical, immunological and other details are documented in Table 1. All the children developed generalized eczema within the first 3 months of life, and, in the 12 months prior to the trial, it had been persistent and unresponsive to topical treatment. Patients with definite allergic reactions to specific foods remained off them throughout the trial. At the commencement of the trial the following tests were performed: a full blood examination and eosinophil count; RAST analysis for serum IgE antibodies to milk, egg, peanut, wheat

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and fish; skin reactions were read at 15 min after prick tests to milk, egg, wheat, peanut, fish, orange, tomato, chocolate, soy, lamb, beef and strawberry. An eczema score was assigned to each child on a normal diet (pre-trial), after 6 weeks on an elemental diet (mid-trial), and 6 weeks after returning to a normal diet (post-trial). As some parents indicated a reluctance to return to a normal diet after remission of eczema had been achieved, the period of elemental diet treatment varied from 6 weeks to 12 months.

At each assessment the eczema was scored for:

- (a) *Severity*: from 0 to 3, according to whether the skin was healed or mildly, moderately or severely affected.
- (b) *Distribution*: from 0 to 3, according to whether the eczema was healed (0—if there had been complete resolution of the eczematous lesions), local (1—involving isolated flexural or local sites), flexural (2—involving multiple flexural sites), or generalized (3—involving trunk and flexural surfaces).
- (c) *Treatment*: based on medication used in the week prior to assessment. Oral steroids (6) and topical applications—0.1% betamethasone valerate (5), 0.05% betamethasone valerate (4), 0.25% fluorcortolone (3) and 0.02% betamethasone valerate (2). The score for topical applications was multiplied by the number of times they were being used daily. Although the children used 1% hydrocortisone ointment for control of facial eczema and 0.02% betamethasone valerate topically for control of generalized eczema, stronger preparations were used to control local lesions if they were unresponsive. The treatment score was based on the strongest application being required for control of any eczema. A total eczema score was calculated by adding (a), (b) and (c) together.

Children were on an unflavoured, elemental diet alone (Vivonex) for the first 2 weeks of this study, but subsequently pumpkin, potatoes, zucchini, apples, pears and pure vegetable margarine were added. A milk-free, gluten-free bread was provided for patients being maintained on diet for more than 3 months.

Results

In all children a small weight loss was seen during the necessary slow introduction of elemental feeding. Once normal concentration and nutritional requirement was achieved, growth centiles were maintained.

The improvement in eczema which followed commencement of diet was demonstrated by a fall in the eczema score as shown in Table 1. Of the ten patients there were two who rejected the diet within the first week of the trial and were eliminated from further study. Wilcoxon's signed rank test for the eight patients showed that the scores were significantly lower when the children were mid-diet, compared to those pre-diet ($P < 0.001$) and post-diet ($P < 0.001$). There was no significant difference between the eczema scores at the pre-diet and post-diet assessments ($P > 0.05$), when patients had been on a normal diet for at least 6 weeks.

Several patients (Nos 1 and 4) remained on diet treatment for more than 3 months. Their eczema deteriorated once the diet treatment ceased, but remission was achieved by reintroduction of the diet up to 2 years after the initial treatment. One patient (No. 3), repeatedly hospitalized before this trial, has remained on an elemental based diet for 12 months. Patient No. 6 relapsed on three occasions when returned to a normal diet and is now maintained on an elemental diet, supplemented with a low allergen diet. Patient No. 2 had generalized eczema and multiple, pustular, maculopapular

Table. Clinical features of children with severe eczema treated with elemental diet

Patient	Eczema duration (yrs.)	Total serum IgE	IgE response to dietary antigens		Eosino-phil count (%)	Eczema score			Known food allergies
			Positive skin tests*	Positive serum RAST†		Pre-trial	Mid-trial	Post-trial	
1	4	5570	10	5	28	21	6	9	Egg
2	7	19 200	6	4	21	24	19	24	Nil
3	3	4110	NK	5	0	9	7	NK	Egg
4	5	9090	4	4	2	17	3	13	Nil
5	11	720	11	4	20	21	Rejected diet		Nuts, orange, chocolate
6	3	10 800	9	5	NK	14	6	20	Egg
7	4	8700	NK	5	4	12	6	9	Banana, orange, egg, peanut, fish
8	2	6250	NK	5	3	12	6	9	Egg, chicken
9	8	180	7	0	1	12	Rejected diet		Nil
10	7	969	NK	5	9	11	4	8	Egg

* The number of positive skin prick tests > 3 mm to twelve dietary antigens.

† The number of positive RAST scores > 1 to five dietary antigens.

NK, Not known.

eruptions. Although his eczema improved on treatment and relapsed on a normal diet, the pustular lesions were unaffected.

Discussion

The results of this study suggest that dietary antigens contribute to childhood eczema. An elemental diet may be of benefit in the management of very severe cases of eczema where the response to standard dermatological topical treatment is unsatisfactory. It is non-antigenic (Galant *et al.*, 1977) and provided adequate nutritional support for these children during severe dietary restriction.

This was a preliminary trial and aimed at exploring alternative lines of treatment for children with very severe eczema. A prospective trial is currently being conducted to further evaluate this type of treatment.

Acknowledgments

The authors are grateful for secretarial assistance from Mrs J. Sedmak and Mrs B. Rowlands. D. J. Hill is a National and Medical Research Council (Aust.) Applied Health Scientist in Allergy.

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