

Dietary restriction and supplementation in children with atopic eczema

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Summary

Issues on empirical dietary restriction or supplementation are important but inadequately studied in children with atopic eczema (AE). The dietary habits of children with AE followed at a paediatric dermatology clinic ($n = 179$) were compared with those without eczema ($n = 78$). The mothers of 53% of the patients with or without eczema did not breastfeed their children. Common food items avoided by parents whose children have moderate-to-severe AE included fish or seafood [64% vs. 32% of controls, odds ratio (OR) 3.84, 95% CI 2.12–6.95], beef (42% vs. 17%; OR = 3.57, 95% CI 1.79–7.11), eggs (34% vs. 14%; OR = 3.05, 95% CI 1.46–6.34) and cows' milk (18% vs. 4%; OR = 5.56, 95% CI 1.61–19.12); whereas their avoidance was less frequent in children with noneczematous diseases. The avoidance of these foods were often based on belief, but 66% of all AE patients who had avoided any of the above foods reported previous experience of eczema exacerbation by these items. Patients with moderate-to-severe AE were more likely to have consumed 'bird's nest' soup and traditional Chinese medicines. It is important to evaluate whether the AE patients are genuinely 'allergic' to some of these food items. Management is suboptimal if children with food allergy and severe disease continue to consume the culprit food. Conversely, avoidance of common foods in children without food allergy could result in food faddism or malnutrition.

Atopic eczema (AE) is a common chronic relapsing disease in children, with the rate of the condition being estimated at about 15%.^{1–3} As there is no definite cure for the disease, parents and guardians caring for children with eczema often adopt various dietary practices such as the avoidance of milk and dairy products, or consumption of unusual foods or substances such as complementary and alternative medicines.^{4–6} Our experience at our paediatric dermatology clinic reveals that many of these children have received various forms of dietary manipulation, some of which may in theory be detrimental to the growth and

development of the child. Dietary practices are one of the most important but inadequately studied issues among these patients. In this study, we aimed (i) to survey the pattern of dietary restriction or supplementation of our patients with AE, and (ii) to evaluate if severity of AE was associated with these practices.

Report

The Clinical Research Ethics Committee of our University approved this study. Patients aged 6 months to 21 years with AE, who were managed in the paediatric dermatology outpatient clinic of a university hospital were recruited. AE was diagnosed according to the criteria proposed by Hanifin and Rajka.⁷ Severity of AE in the preceding 12 months was assessed clinically by the Nottingham Eczema Severity Score (NESS).^{8,9} We have previously found that the NESS is a valid score for the rapid assessment of severity of AE, and is easy to

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perform by parents or untrained staff.⁹ The dietary habits were assessed by a research assistant (WYCK) in accordance with a checklist questionnaire (available from authors upon request). Children seen at the clinic for noneczematous skin conditions, such as acne, various birth marks and pigmented skin lesions, during the same period were recruited as controls. Patients were excluded if they were not accompanied by caregivers or when these caregivers could not provide reliable information. Patients with other inflammatory dermatitides, such as psoriasis, seborrhoeic dermatitis or ichthyosis were also excluded. χ^2 was used to compare proportions.

Odds ratios and 95% confidence intervals were calculated as indicated. All comparisons were two-tailed, and $P < 0.05$ was considered to be statistically significant.

Between November 2004 and February 2005, 290 patients were seen in the clinic. Of these, 33 children (11%) were excluded from analysis because of noneczematous dermatitides or incomplete data. Of the remainder, 47 patients (26%) had mild AE, and 132 of them had moderate-to-severe AE according to NESS. All patients were of ethnic Chinese origin. The mothers were the informants for 80% of the patients. The dietary habits of the AE patients followed at the clinic ($n = 179$) were compared with those without AE ($n = 78$) (Table 1).

The mothers of 53% of patients either with or without eczema did not breastfeed their children. Soya milk was only used for three of the patients with moderate-to-severe AE who were not breastfed. The parents of 12% of noneczematous patients thought that their child might have some form of food allergy, where 55% of parents of all patients with AE thought that their child had food allergy. Common food items avoided by parents who had a child with moderate-to-severe AE included fish or seafood (64%), beef (42%), eggs (34%) and cows' milk (18%), whereas avoidance of these food items was infrequent in noneczematous diseases. Most (66%) of the AE patients who had avoided any of the above foods reported previous experience of eczema exacerbation by these items. There was no significant difference between the groups with regard to soya milk use prior to 6 months of age. Patients with AE were more likely to have consumed unusual foods such as bird's nest soup or traditional Chinese medicines (TCM); 9 patients in the mild AE group (19%) vs. 48 (36%) of the more severe patients had consumed bird's nest soup ($P = 0.046$; odds ratio 2.41 and 95% confidence interval 1.01–5.89). Patients with moderate-to-severe AE were more likely to have consumed drinks, TCM,

vitamin supplements and cod liver oil but there were very few who reported unusual food consumption in this series, such as crocodile meat ($n = 1$) or pollen ($n = 4$). Parents of children with moderate-to-severe AE were more likely than controls to think that their child had an allergy [58% vs. 12%; odds ratio (OR) 10.40 and 95% confidence interval 4.55–24.49; Table 1]. Doctors, the media, friends and relatives appeared to be the major sources of advice that influenced the dietary practices and beliefs of these parents (Table 2).

There was a significant proportion of AE patients with moderate-to-severe disease whose parents would avoid giving seafood, beef or eggs, and gave complementary and alternative food materials to their children with AE, such as bird's nest soup and TCM. It is important to note that traditional Chinese or Asian culture often regards these food items as beneficial. Only one patient with severe AE reported using evening primrose oil as a complementary treatment.

These findings were different from the recent UK study,⁵ which reported that the most common foods omitted were dairy products (48%), eggs (27%) and cow's milk (25%). In the UK study of mixed ethnicity, 75% had tried some form of dietary exclusion and 41% had tried some form of supplementation. The most common dietary supplement was evening primrose oil (used by 59%), of whom 13% felt this had helped their skin problem. Only 51% had consulted a doctor or dietician before altering their diets, but 39% felt that their skin had improved as a result of this dietary manipulation. In our study, only participants of Chinese ethnicity were studied, and controls were used. Severity grading of AE was also considered in the analysis. This study is a cross-sectional analysis and patterns of dietary changes were not evaluated.

This study works towards a better understanding of the dietary practices and preferences of patients with AE. Most children in Hong Kong have not been breastfed. Dietary practices are cultural and may vary from country to country. Instead of giving nonspecific dietary advice or adopting guidelines from another culture, it is important to tailor instructions to individuals for optimum compliance. We advise that young patients with AE should be breastfed and introduction of solid food avoided until 6 months of age. Apart from cost considerations, some of the alternative food materials such as bird's nest soup may contain protein and fibre that are difficult to digest, and some components may cause severe allergic reaction or even anaphylaxis in infants and young children.^{10,11} Much of the advice that clinicians provide during patient education is

Table 1 Diet practices in patients with and without atopic eczema (AE).

	Group A No AE (n=78)	Group B ₁ Mild AE (n=47)	Group B ₂ Moderate-severe AE (n=132)	P value by χ^2	Yates corrected P value		
					A vs B ₁	A vs B ₂	B ₁ vs B ₂
Age < 5 years	19 (24%)	8 (17%)	20 (15%)	NS	NS	NS	NS
Age ≥ 5 years	59 (76%)	39 (83%)	112 (85%)				
Male gender	38 (49%)	20 (43%)	78 (59%)	NS	NS	NS	NS
Female gender	40 (51%)	27 (57%)	54 (41%)				
Food prepared by parents	58 (74%)	35 (74%)	89 (67%)	NS	NS	NS	NS
Food prepared by others	20 (26%)	12 (26%)	43 (33%)				
Breastfeeding tried	29 (37%)	23 (49%)	66 (50%)	NS	NS	NS	NS
Breastfeeding not tried	49 (63%)	24 (51%)	63 (50%)				
Fish/seafood	25 (32%)	22 (47%)	85 (64%)	<0.001	NS	<0.001	NS
No fish/seafood avoidance	53 (68%)	25 (53%)	47 (36%)				
Cows' milk avoided	3 (4%)	5 (11%)	24 (18%)	0.009	NS	0.005	NS
No avoidance	75 (96%)	42 (89%)	108 (82%)				
Beef avoidance	13 (17%)	14 (30%)	55 (42%)	<0.001	NS	<0.001	NS
No beef avoidance	65 (83%)	33 (70%)	77 (58%)				
Egg avoidance	11 (14%)	9 (19%)	45 (34%)	0.003	NS	0.003	NS
No egg avoidance	67 (86%)	38 (81%)	87 (66%)				
Miscellaneous dairy products*	4 (5%)	2 (4%)	14 (11%)	NS	NS	NS	NS
No avoidance	74 (95%)	45 (96%)	118 (89%)				
Unusual food tried	18 (23%)	11 (23%)	60 (45%)	<0.001	NS	0.002	0.013
No known unusual food consumption	60 (77%)	36 (77%)	72 (55%)				
Vitamin supplements	19 (24%)	7 (15%)	55 (42%)	<0.001	NS	0.017	0.002
No vitamin	59 (76%)	40 (85%)	77 (58%)				
Calcium supplements	5 (6%)	3 (6%)	18 (14%)	NS	NS	NS	NS
No calcium	73 (94%)	44 (94%)	114 (86%)				
Cod liver oil	16 (21%)	8 (17%)	45 (34%)	0.024	NS	NS	0.044
No cod liver oil	62 (79%)	39 (83%)	87 (66%)				
TCM tried	17 (22%)	15 (32%)	78 (59%)	<0.001	NS	<0.001	0.002
TCM not tried	61 (78%)	32 (68%)	54 (41%)				
Soya before 6 months							
Yes	10 (13%)	4 (9%)	29 (22%)	NS	NS	NS	NS
No + don't know/cannot recall	68 + 0 (87%)	42 + 1 (91%)	100 + 3 (78%)				
Solid food before 6 months							
Yes	20 (26%)	18 (38%)	37 (28%)	NS	NS	NS	NS
No + don't know/cannot recall	53 + 5 (74%)	21 + 8 (62%)	86 + 9 (72%)				
Thinks child has food allergy							
Yes	9 (12%)	23 (49%)	76 (58%)	<0.001	<0.001	<0.001	NS
No + don't know	65 + 4 (88%)	21 + 3 (51%)	52 + 4 (42%)				

*Cheese, yogurt; bird's nest soup, honey, crocodile meat.

Table 2 Sources of dietary advice of AE patients (*n* = 179).

Sources	Number (%)
None	79 (44)
Doctors	34 (19)
Media*	29 (16)
Friends	26 (15)
Relatives	24 (13)
Chinese medicine practitioners	12 (7)
Grandparents	9 (5)
Miscellaneous	10 (6)

*Included TV, newspaper, radio, magazine, book, health talks or pamphlets; nurse, teacher, nutritionist, neighbours, other parents.

based on common sense rather than evidence, and more research on the issues of dietary advice is needed. It is important to evaluate whether some of these food items are genuinely allergy-causing or harmful for patients with AE. Management is suboptimal if children with food allergy and severe disease continue to consume the culprit food. On the other hand, avoidance of common food materials in children without food allergy could result in food faddism or malnutrition. Dermatologists, paediatricians and family physicians should be aware of the contemporary dietary fashion in children with AE.

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Appendix: Questionnaire used in the study

Dietary survey

- Who is mainly responsible for preparing food to the child?
Mother / Father / Guardian(s) (____) / Other(s) (____)
Are they non- vegetarians, vegetarians or vegans?
Mother: Non-vegetarian / vegetarian / vegan
Father: Non-vegetarian / vegetarian / vegan
Paternal grandfather: Non-vegetarian / vegetarian / vegan
Paternal grandmother: Non-vegetarian / vegetarian / vegan
Maternal grandfather: Non-vegetarian / vegetarian / vegan
Maternal grandmother: Non-vegetarian / vegetarian / vegan
Guardian(s): Non-vegetarian / vegetarian / vegan
Other(s): Non-vegetarian / vegetarian / vegan
 - What is the education level of the child's parents?
Mother: primary / secondary / tertiary / others:
Father: primary / secondary / tertiary / others:
 - Was the child breastfed, formula or mixed?
A. Breastfed / B. Formula / C. Mixed
If answer A or C is chosen, when did mother stop breastfeeding?
Before 6 months / 6 month- to 1 year-old / 1 year-old to 1.5 year-old / Others (____)
 - Was the child fed with soya milk before 6-months old for at least 1 week? Yes / No
Why? _____ Duration _____ weeks / months

Was the child fed with soya milk after 6-months old for at least 1 week? Yes / No
Why? _____ Duration _____ weeks / months
 - When was solid food (e.g. puree, congee) introduced to the child?
 - When were the high allergenic foods (seafoods, tree nuts, peanut) introduced to the child?
Details: _____
 - How frequent (every month) is your child taking these allergenic foods in the past three months?
Details: _____
 - Do you think the ingestion of these allergenic foods worsen skin problem in your child? Yes / No
 - Which type of cow's milk is taken by the child now, skim milk or whole milk?
Skim milk / Whole milk / No milk
 - Has the child consumed any special food listed as follow?

Bird nest	TCM	Vitamins (____)	Calcium	Cod liver oil	Others (e.g. insect, fungus, Zn, Fe supplement etc):
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 - Has the child avoided any food list as follow?

Diary products	Eggs	Cow's milk	Food additives/colourings	Chocolate	Candy	Soft drinks
Fish/seafood	Pork	Beef	Chicken	Nuts	Wheat	Cereal
Vegetables	Tomatoes	Potatoes	Carrots	Fruits ()	Others:	Rice
Honey						

Why? _____
Aggravation / Worry / Positive skin tests / Others (____)
 - Whose dietary advice is usually applied?
Grandparents / Friends / Doctors / Others (e.g. TV, magazine, etc _____)
 - Is the child restricted from sunlight exposure due to the underlying skin condition?
(no restriction) 0 1 2 3 4 5 6 7 8 9 10 (total restriction)
 - Does the child usually apply any sunscreen when he/ she is outdoor? Yes / No
 - Are there any smoker at home? Yes / No
Who? _____
How much does he / she smoke per day? _____
Do you think cigarette-smoke exposure worsen skin problem in your child? Yes / No
 - Are there any furry pet at home? Yes / No
Type and number? _____
Do you think furry pet contact worsen skin problem in your child?
Yes / No
 - Do you think your child has any food allergy? Yes / No
 - Do you think that dietary avoidance helps your child's skin problem? Yes / No
- Dry skin Y/N, Itch Y/N, Patient Atopy Y/N _____, Family Atopy Y/N _____