

Dietary manipulation in childhood atopic dermatitis

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SUMMARY

The dietary habits of 73 children seen consecutively in a dermatology out-patient department were studied to ascertain the nature and frequency of dietary manipulation and to assess any potential hazards. Although most children had only mild flexural dermatitis, 71% had had significant alterations made to their diet before attendance at hospital. Almost all diets were unsupervised and only six children had seen a dietitian. Over half had been started on diets before any professional advice had been sought. Information on diet had come from media, books or magazines (51%), friends (32%), general practitioners (27%) and district nurses or health visitors (18%). The major dietary alterations included the exclusion of eggs, dairy products and food additives, and the use of soya and goat's milk. Under 10% of patients claimed benefit from these largely unsupervised diets. Harmful practices included the frequent use of unboiled, unpasteurized goat's milk, unmodified goat's milk in a baby of 4 months and the use of severely restricted diets. Three children (6%) in the diet group had been on diets which were considered by a hospital dietitian to be particularly dangerous. However, there was no evidence of growth retardation, failure to thrive or specific deficiency syndromes in the group we studied. Uncontrolled, unsupervised and often prolonged dietary alterations are commonplace in children with atopic dermatitis. This is a potentially serious health problem.

Dietary alteration has been recommended as a treatment for childhood atopic dermatitis.¹⁻⁴ However, the value of this has not been established and several authors have pointed out the potential physical, psychological and financial hazards.^{3,5-11} The need for careful dietetic supervision and the appropriate selection of patients has been repeatedly stressed.^{1,7-9,12-14}

However, it was our impression that many children with atopic dermatitis have been put on uncontrolled and unsupervised diets, and that parental education about atopic dermatitis has been poor. We have, therefore, attempted to assess the extent and potential hazards of this practice.

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METHODS

Seventy-three consecutive children with typical symmetrical atopic dermatitis seen in the Dermatology Department of the Leicester Royal Infirmary were studied. These were either new patients or patients under follow up attending for routine review. There were 41 boys and 32 girls. Only children under 16 years of age were included, the age range being 4 months to 15 years (mean 5.1 years). At least one parent was required to be present (usually mother or both parents). Twenty-nine (40%) of the children were of Asian origin, the remainder were white. A semi-structured questionnaire was administered by one of us (SAW).

A history including age of onset and course of the dermatitis was obtained, and the treatment regimes and need for hospital admissions recorded. The amount and potency of topical steroids used per year was assessed. Details of past medical history and any family history of atopy were noted. Each child was examined by one of us (SAW) and the percentage of body surface area involved at the time recorded. The overall severity of dermatitis was assessed retrospectively by the examining doctor on a scale of 1–5 (1—least; 5—most severe) using a combination of the history, case notes, treatment requirements and clinical examination. Parents were also asked to grade independently the average severity of their child's dermatitis on the same 1–5 scale. The height, weight and head circumference of each child was measured and plotted on standard centile charts.

Parents were questioned about occupation, height, diet (for example vegetarian) and religion. They were asked about their general views on the cause of dermatitis and whether they had any view on the role that diet might play, both generally and with specific reference to possible precipitants in their child. The sources of any such information were then examined, with particular reference to the nature of the advice obtained from health professionals. Parents were asked to give details of any dietary changes they had introduced and to state whether these were carried out before or after professional advice (if any) had been sought. They were asked if they had seen a dietitian at any time. Finally, they were asked whether they thought that diet had helped.

RESULTS

The diets of 52 of the 73 new and review children (71%) in the study group had been significantly altered before their first attendance at hospital. Dietary alteration was defined as the exclusion of at least one major item of food, previously regularly eaten, for one week or more. The incidence was greater amongst white families (35/44; 80%) than Asian families (17/29; 59%) [$\chi^2 P=0.05$]. All the white families and 22/29 (76%) of the Asian families were normally meat-eating.

Alterations made to the children's diets ranged from exclusion of minor items to complex exclusion diets. The major items excluded are shown in Table 1. Two children had supplements made to their diets (zinc in one; oil of evening primrose in another). One mother had set up a local 'allergic children's group' to exchange ideas about food allergy in dermatitis. Most parents in the diet group had experimented with the exclusion of a variety of food items at different times. Most dietary changes were carried out within 1–2 years of the onset of the dermatitis. Of those children in the diet group (total 52), five (10%) had been on diets for a period from 1 week to 1 month, 11 (21%) from between 1 and 3 months, 12 (23%) from 3 months to 1 year and 24 (46%) had been on diets for over a year.

Ninety per cent of the parents with children on diets definitely felt that the diet had been of no

TABLE 1. Major alterations made to children's diets ($n = 52$)

Excluded items	Number
Cow's milk	38
Eggs	14
Preservatives and additives	11
All cow's milk products	10
Colourings	7
Tomatoes	5
Sweets	5
Complex exclusion diets from Immunology clinic	5
All cheeses	3
Others (18 items or group of items in total)	40*
Specific Additives	
Goat's milk	24†
Soya milk	14
Zinc	1
Oil of evening primrose	1

* This includes one gluten free diet and one low salt diet.

† Only nine of 18 parents recalled boiling unpasteurized goat's milk.

benefit to the extent or severity of the dermatitis, although nine found that a single foodstuff appeared to exacerbate the condition (Table 2). The remaining 10% of parents thought that diet may have been of some help, but none had found that the eczema had improved sufficiently to suspend other therapeutic intervention. Several parents stated that, despite the lack of benefit from exclusion diets, they had not re-introduced foods through fear of exacerbating their child's dermatitis. Several parents and children remarked that the diet could be more trouble than the dermatitis, especially when the child reached school age and started to visit the homes of friends.

Several potentially harmful practices were encountered. For example, goat's milk (usually bought unpasteurized) was not boiled in approximately two-thirds of cases. Three diets were considered by a hospital dietitian to be particularly dangerous. In the first, a baby of almost

TABLE 2. Food(s) thought to cause exacerbation of eczema among the diet group $n = 9$

Food blamed	Number
Cow's milk	2
Ketchup	2
Sweets	1
Fizzy drinks	1
Colourings	1
'Fatty' foods	1
Chocolate, fizzy drinks and grapefruit	1

4 months was given unmodified and unpasteurized goat's milk despite its high solute load and infection risk. This was recommended by a district nurse and was continued for 6 weeks until the child's grandmother told her daughter that such unmodified milks were unsuitable for such a young child. In a second case a 7-month-old boy was started on a diet intended to be free of gluten, meat, all cow's milk products, eggs and all added sugar. This diet was continued for 3 months and the child was fed almost entirely on unpasteurized goat's milk and minced vegetables, in particular large amounts of carrots. The child's father was a catering manager with the local council and no professional advice had been sought. In the third case a 3-year-old boy was started on a diet free of all cow's milk products, eggs and meat and from which all added sugar and salt were excluded. This diet was continued for 18 months. Again, no professional advice had been sought. None of these three children had severe dermatitis, the first two being labelled as Grade 2 and the last as Grade 3 by the examining doctor.

Parental views as to the major causes of dermatitis are shown in Table 3. In the non-diet group three parents thought that food allergy might play a role in dermatitis but no parent in this group had noted any specific foods which exacerbated their child's dermatitis. However, over 50% of the parents in this group had heard or read of a possible association between dermatitis and diet. Asian parents in the non-diet group were far less likely to have heard or read about such an association (25% of Asians vs. 89% of whites, $\chi^2 P < 0.02$). In the diet group all parents had heard of a link between diet and dermatitis and 46% thought that food allergy was the main cause of their child's dermatitis. In this group 35% of the parents thought that specific foods had exacerbated their child's dermatitis. However, a careful history revealed that nine of these 18 children developed skin changes immediately after contact with the food and were clearly experiencing contact urticaria. In the other nine cases the dermatitis was thought to deteriorate over the following 1-4 days. Most parents commented on the great difficulty of attributing blame to specific food items consumed in the few days previously.

The sources of information given by parents from which they had learnt about the possible role of diet are shown in Table 4. Only two general practitioners and one health visitor had discouraged the use of dietary changes. All the other community based health professionals had suggested that a trial of dietary alteration might be worthwhile. Health professionals mostly advised exclusion of cow's milk, eggs or all dairy and egg products, often suggesting substitution with goat or soya-based milks. However, very few of the parents could recall being given any specific advice on when benefit was to be expected, how long to continue the diet, and when and if to reintroduce the excluded foods. No one remembered being told of the possible hazards

TABLE 3. Parental views on cause(s) of eczema

Offered cause	Diet (n = 52)	Non-diet (n = 21)
No idea	12	10
Constitutional/Hereditary	8	6
'Definite' food allergy	24	0
'Possible' food allergy	0	3
Other allergy	9	2
Stress	3	1
Maternal diet (in pregnancy)	1	0
Other causes (e.g. weather, blood disorder)	3	2

TABLE 4. Sources of information regarding role of food allergy in eczema

Source	Number
Books/magazines/T.V./radio	37
Friends and neighbours	23
General practitioners	20
Hospital consultants	16
Health visitors/District nurses	13
National Eczema Society	9
Personal observation	5
Other:	
Clinical psychologist, herbalist, homeopath, schoolteacher	6

associated with re-challenge. None had been sent to see a dietitian. The only patients who had received dietetic supervision were those who had been started on complex exclusion diets in an Immunology clinic, all of whom were seen by a hospital dietitian. Fifty-four per cent of parents in the diet group had initiated dietary alteration before any form of professional advice had been sought.

There was no significant difference in birth weights, family history of atopy ($\chi^2 P > 0.1$), incidence of breast feeding ($\chi^2 P > 0.05$), personal history of additional atopic disease ($\chi^2 P > 0.5$) or in parental social class ($\chi^2 P > 0.5$) between the diet and non-diet groups.

Parental gradings of the severity of the dermatitis were slightly higher (i.e. more severe) than the doctor's in both diet and non-diet groups, and as judged by both parental and doctor grading, the group on diet had slightly more severe dermatitis. However, even in the diet group 46% were graded by the doctor as having very mild or mild dermatitis only (Grade 1 or 2), with

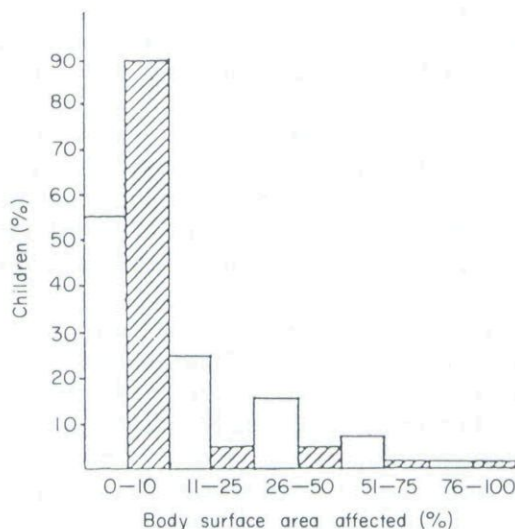


FIGURE 1. Table showing % of body area affected by eczema at time of study in diet and non-diet group. □, diet group; ▨, non-diet group.

54% having flexural disease occupying less than 10% of the body surface area (Fig. 1). Only 15% of the diet group and 5% of the non-diet group were considered to have severe dermatitis (doctor's Grade 4 or 5).

In both groups topical steroids were used appropriately in most cases. Only one case was encountered of obvious excess use (50 g of 50% Dermovate per week being applied to the body and face of a 6-year-old boy with mild to moderate dermatitis). However, in four instances there was a complete refusal to use even mild topical steroids in children with troublesome dermatitis (Grade 3 or over). This arose from misplaced parental anxiety about the side-effects of mild topical steroids. All these four children had been placed on special diets.

No significant differences in growth were demonstrated between the two groups of children (Mann-Whitney *U*-test; NS) and no case of failure to thrive or deficiency syndrome secondary to dietary manipulation was encountered in this series.

DISCUSSION

There have been few controlled studies performed to assess the role of dietary exclusion in childhood atopic dermatitis^{2,15} and its efficacy has not been established. The most commonly quoted report² was a small study with a high drop-out rate in a highly selected group of patients. This study did suggest a benefit from exclusion of cow's milk and eggs. Even enthusiasts of such exclusion diets have pointed out that most dermatitis is mild and can be treated with simple topical applications of emollients and mild topical steroids.^{8,12,14} It is also widely acknowledged that exclusion diets are difficult to achieve and need careful dietary advice and supervision.^{1,3,9,13}

Our study has relied on the memory of past events by the children's parents. However, despite the inherent problems of this retrospective technique, it has clearly been demonstrated that dietary alteration is commonplace (71% of the children in this study) amongst children with atopic dermatitis seen in a dermatology clinic. Most of the children on special diets had only mild or moderate dermatitis, often limited to the flexures. Many of these children could have been managed adequately with reassurance, advice and appropriate simple topical therapy. Few parents felt that diets had improved the dermatitis, although it could be argued that this is a reflection of the uncontrolled and haphazard way in which most of the diets were instituted; for example cow's milk was frequently excluded but without exclusion of other cow's milk products. We have not encountered cases of failure to thrive in this study nor was significant growth retardation demonstrated in the diet treated group. This may reflect the small sample size and the fact that severely restricted diets formed only a small minority of the diet group. However, it is also possible that single measurements of growth might fail to detect earlier periods of growth delay if associated with subsequent catch up growth when a normal diet is resumed.

It is interesting to note that much of the advice on alteration of diets (especially cow's milk exclusion) came from general practitioners, health visitors and district nurses. It seems likely that many atopic children with mild dermatitis, who are never referred to hospital, are also being advised on special diets. The media and 'health industry' must also bear much of the responsibility for misguided and inaccurate opinions held by the public on this issue. Many parents firmly believed that goat's milk or soya-based milks were of proven benefit for childhood dermatitis.

In contrast to the dearth of evidence which exists to support the widespread use of diet in atopic dermatitis, several reports and reviews have been published drawing attention to the

potential hazards of this practice.^{5-11,16} These include failure to thrive⁶ and vitamin and mineral deficiency,¹¹ as well as the potential serious hazards of feeding unmodified, and often unpasteurized goat's milk to small babies.¹⁰ Furthermore, there may be adverse psychological effects of dietary restriction, particularly when children reach school age. The cost of inappropriate special diets (e.g. gluten free diets) can also be a significant burden to the family. The risk of re-introduction of excluded food items must be borne in mind.⁵ Finally, some children clearly prefer dermatitis to dietary restriction.

The children who were on severe or potentially dangerous diets did not have severe dermatitis, and this parental infliction of misguided treatment on their children has been viewed by some to merge into the realms of Meadow's syndrome.¹⁷ It is disturbing to note that both in our study and that of others^{17,18} haphazard and unsupervised dietary restriction has often been initiated by doctors or other health professionals.

The large Asian population of Leicester enabled us to study ethnic variation in public understanding of the nature and management of atopic dermatitis. Fewer Asians tried dietary alteration as compared to Caucasian parents and this reflected the higher proportion of Asians who claimed no knowledge about the cause of dermatitis or its possible relation to diet. These findings are in keeping with those in other chronic conditions, such as diabetes¹⁹ and renal failure, where patient education amongst Asians appears poor even in centres where Asians form a high proportion of the total population. Paradoxically this lack of awareness of a possible relationship between diet and dermatitis amongst many Asian families may have protected the children from erratic and unsupervised dietary alterations. There is an obvious need for better education about the nature of dermatitis amongst Asian families, but this needs to be promoted carefully so as to prevent the use of unsupervised diets in this group.

We conclude that dietary manipulation in a hospital clinic population of children with atopic dermatitis is extremely common, and is frequently applied to children with only mild dermatitis. Few parents felt that the diets had been helpful, although this may reflect the inadequate nature of the diets. Contrary to published advice, these diets are uncontrolled, unsupervised and are often continued indefinitely. This is a potentially serious health problem.

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