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ALLEVIATION OF ATOPIC DERMATITIS WITH γ-LINOLENIC ACID-CONTAINING SAUSAGE

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BACKGROUNDS:

Cases of atopic dermatitis have increased and become major public concern. According to the surveillance by the Japanese Ministry of Health and Welfare (MHW), approximately 30% of Japanese children (<3 years old) are suffering from atopic dermatitis.
It has been reported that γ-linolenic acid can effectively alleviate atopic dermatitis and that atopic dermatitis patients are deficient in γ-linolenic acid, a metabolite in the arachidonate cascade. In European countries, γ-linolenic acid has been approved as a remedy for atopic dermatitis [1, 2]; γ-linolenic acid is a constituent of seed oil of *Borago officinalis* L, so-called borage oil [3].
The atopic dermatitis patients frequently suffer from food allergy: major allergens are chicken eggs, cow milk, soy bean, and so forth. Generally , management of eating habits and the environment have been recommended to prevent atopic dermatitis. Retreat from food responsible for atopic dermatitis is recommended as a conventional therapy [4] , but it might result in malnutrition and growth inhibition.

OBJECTIVES:

The present study was to evaluate effectiveness and usefulness of sausages prepared without any of milk, chicken egg and soybean proteins but with borage oil from the viewpoints of therapy of atopic dermatitis and supply of delicious and nutritious foods.

MATERIALS AND METHODS:

Test sausages: Test sausages were conventionally prepared with γ-linolenic acid but without curing agents, preservatives, food dyes or any of such binders as egg, milk and soybean proteins. Pork, turkey, lamb and rabbit were individually used as raw meats due to their low allergic properties. γ-Linolenic acid content was so designed as to be 90 mg/25-g link and confirmed by gas-liquid chromatography.
Clinical studies: Clinical studies were carried out at seven hospitals in Shizuoka Prefecture, Japan. The studies were carried out with informed consent. Thirty volunteers (2-46 years old) participated in the clinical evaluation and ate the test sausages (1 link/day; 90 mg of γ-linolenic acid) for 8 weeks.
The studies were made in parallel with normal medical treatments with steroid (strong rank or mild rank), antiallergic medicine, antihistaminic medicine and skin cream. Treatment with steroids by injection or external use of very strong steroid agents were prohibited during the study. The studies were made for 4 to 8 weeks until the doctors concluded that the alleviation of the symptoms was obvious.
Examination and evaluation: Utility of the test sausages was determined by the following viewpoints; patients' clinical backgrounds, objective and subjective symptoms, adverse and overall effects, wholesomeness and efficiencies. Degrees of such objective symptoms as itching, erythema, papula, lichen, erosion and exfoliation were diagnosed by the physicians with scores from 0 (no symptom) to 5 (severe symptom).

RESULTS AND DISCUSSIONS:

A total of 29 cases were evaluated for effectiveness and usefulness. The study periods required for conclusion were 4 weeks in eight cases (27.6 %) , 6 weeks in 17 cases (58.6 %) and 8 weeks in four cases (13.8 %) , respectively.
The scores of objective symptoms such as itching, erythema, papula, lichen and exfoliation significantly decreased in 2, 4, 6, 6 and 2 weeks, respectively, from start of eating the sausages (Table 1). The participants did realize that itching and exfoliation, namely dry skin, dramatically faded away. Neither side effect nor significant problem was observed. It was suggested that γ-linolenic acid improved atopic dermatitis by compensation for fatty acid metabolism [2, 5].
With efficiency as a health-supporting food, the test sausages were considered to be extremely, moderately, fairly and not efficient in

two (6.9%), three (10.3%), 15 (51.7%) and nine (31.1%) cases, respectively (Table 2). Namely, the efficiency of the test sausages was confirmed in approximately 70% cases. Such a figure is rather higher than the frequency of the efficiency of ordinary medicines, since ordinary medications are effective in about one-half atopic-dermatitis patients.

Since the atopic-dermatitis patients frequently suffer from food allergy, avoidance of chicken eggs, cow milk, soybean and processed foods prepared from them can alleviate the symptoms. Ironically enough, however, this might result in malnutrition and growth inhibition, particularly in infants and young children. However, the test sausages were not allergic, since they were prepared without curing agents, preservatives, food dyes or such binders as egg, milk and soy proteins but with pork, turkey, lamb and rabbit: we previously demonstrated that these meats are little or not allergenic compared with beef and chicken.

The normal therapy of atopic dermatitis is oral and external treatments in parallel with guidance on eating habits, especially elimination of allergens [4]. However, with infants in their growth period, it is necessary to supply sufficient nutrients with alternative foods [6]. Meat is an excellent source of proteins, and development of atopic dermatitis symptoms with meat is rare among infants [7]. The food-treating method for elimination of allergens may cause other problems, such as mental stresses, excessive expenditure, and the like. Therefore, the present sausages may be attractive to all the families from not only of effectiveness but also taste and convenience.

CONCLUSION:

The test sausage with γ-linolenic acid but without allergenic material can effectively alleviate the symptoms of atopic dermatitis.

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REMARK:

Based on such findings, the sausage described above has been marketed with a trade name of " Aplilight " in Japan and approved as a " food for those with allergies " by MHW.

Table 1. Alleviation of atopic dermatitis with γ-linolenic acid-containing sausage

Objective symptom	Degree of objective symptom			
	0	2	4	6 weeks
Iching	2.17±0.19	1.48±0.16*	1.46±0.20**	1.53±0.23**
Exfoliation	1.90±0.14	1.33±0.14**	1.50±0.15**	1.47±0.19**
Erythema	1.55±0.21	1.10±0.22	1.04±0.20*	1.12±0.24**
Papula	1.38±0.21	0.95±0.21	1.04±0.21	1.00±0.19*
Lichen	1.31±0.21	1.14±0.24	1.08±0.23	0.94±0.20
Erosion	0.62±0.20	0.33±0.14	0.42±0.19	0.18±0.13*

Degree of objective symptoms were diagnosed by physicians with scores from 0 (no symptom) to 5 (severe symptom).
(Mean±S.E., *: $p<0.05$, **: $p<0.01$)

Table 2. Efficiency of γ-linolenic acid-containing sausage as health-supporting food

Efficiency	Case	%
Extremely efficient	2	6.9
Moderately efficient	3	10.3
Fairly efficient	15	51.7
Not efficient	9	31.1