



Professional article

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MEDICAL NUTRITION THERAPY IN MANAGEMENT OF FOOD ALLERGY

SUMMARY

When a food allergy diagnosis has been made, the avoidance of allergenic food is the key towards successful management. The aim of this review was to summarize the research and clinical evidence about medical nutrition therapy in food allergy and to reduce the food allergic patient's risk of developing malnutrition. Material and methods present a review of the literature with clinical perspectives, but also include a commentary based on the authors' clinical experience. Allergenic food exclusion claimed efficacy in more than 90 percent of the analyzed studies. The food-allergic patient is less likely to develop nutrient deficiencies when provided with appropriate food alternatives and careful monitoring, while eliminating the food allergen(s) from the diet management requires a multidisciplinary approach and follow-up. The main management strategies for IgE-mediated food allergy are avoidance of allergens, especially in children. Identifying individuals at risk may protect and improve the patient's nutritional and overall health status. Every effort should be made to ensure that the patients are fully educated in dietary management measures and the dietician is the most qualified professional to address the food-allergic patient's medical nutrition therapy needs.

Key words: food allergy, food hypersensitivity, medical nutrition therapy, elimination diet

INTRODUCTION

During their lifetime, about one quarter of the population will have some sort of adverse reaction to food, especially during infancy and early childhood. These adverse reactions are classified as food allergy, food intolerance, pharmacological reactions, food poisoning and toxic reactions. Food allergy is a condition caused by an IgE-mediated reaction to a food substance that occurs in 1% to 2% of the general population and in about 8% of children (1,2).

The evaluation and management of food allergy have become more sophisticated and have

changed significantly in recent years (3, 4). In general, there are four approaches to the management of food allergy: avoidance, education, pharmacotherapy and immunotherapy.

Total avoidance of a food allergen is the only proven treatment for food allergy. Patients, their families and health care workers need guidelines and suggestions for avoiding allergenic foods in meal planning and preparation and selecting nutritionally adequate replacement foods.

AIMS

The aim of this review was to summarize the

research and clinical evidence about medical nutrition therapy in food allergy and to reduce the food allergic patient's risk of developing malnutrition.

MATERIAL AND METHODS

A review of the literature with clinical perspectives was performed, including a commentary based on the authors' clinical experience in the Nutritional Unit of a Public Health Institute in Nis. Medline searches, using the terms food allergy, food intolerance, diet, nutrition and related terms were done and many allergy and dietary textbooks were used to identify articles and materials. Published work was then selected for inclusion on the basis of importance, pertinence, timeliness, accessibility, and for further reading potential.

RESULTS AND DISCUSSION

Many foods have been claimed to cause allergy, but controlled studies show that a limited number of foods are responsible for the vast majority of cases (Table 1).

Table 1. The most common food allergens

Food	Cross reacting foods
cows' milk	goats' milk, ewes' milk
hens' eggs	eggs from other birds
fish, shellfish	mackerel, herring, plaice, crustaceans etc.
peanuts, tree nut	soy beans, green beans, green peas
wheat	mostly unknown

Also, some people are allergic to strawberries and other berries, citrus fruits, tomatoes and chocolate. Foods that rarely cause allergic reaction include rice, lamb, gelatin, peaches, pears, carrots, lettuce and apples.

The presence of food allergens can often compromise an individual's nutritional status (10). Attention to adequate nutrition must be an essential component of food allergy treatment.

Appropriate nutrition management can:

1. Promote nutritional adequacy and contribute to improved health,
2. Enhance outcome of food allergy treatment,
3. Improve management of comorbid conditions, and
4. Foster a sense of well-being.

To provide appropriate nutrition care, health care practitioners must have adequate knowledge of

the principles of human nutrition, the components of a healthy diet, and the complexities of dietary behavior. In treating food allergies, it is also necessary to be knowledgeable about food sources of nutrients, botanical relationships, food composition, cooking methods, and alternative products and where they are available. Dietary modifications typically involve changes in lifestyle and are usually not easily accomplished. Clinicians with counseling skills as well as patience and sensitivity will be better able to assist individuals in complying with recommendations and achieving the desired results.

Enabling patients to accomplish dietary change is a sequential process that requires and careful consideration of expected outcome versus cost to the patient. A complete assessment, the development and implementation of a realistic plan, ongoing follow – up, and evaluation are essential to improving outcome.

A comprehensive nutrition assessment that includes a careful evaluation of anthropometric, biochemical, clinical, dietary, and social parameters should be incorporated into the management of patient with food allergy. These factors provide the basis for nutrition recommendations and will contribute to successful outcomes.

Patient history is very important. Patients should be asked to describe their perceptions about allergy symptoms, causes, frequency and severity. Details about season, location, and environmental factors are also relevant. Additionally, it is necessary to assess how seriously the individual's lifestyle is affected by allergy.

Patients should be weighted at each visit and any changes in weight evaluated (Table 2).

Table 2. Checklist for Assessing Nutritional Status*

BMI < 20 or > 30 kg/m ²
Rapid weight loss (? 5% of body weight in 1 month)
Major weight loss (? 10% in 6 months)
Low serum albumin (< 3,5 g/dl)
Low serum cholesterol (< 130 mg/dl)
Poor appetite

* Positive response to any of the above may indicate increased risk for compromised nutritional status.

Many lifestyle factors can affect a patient's ability and willingness to implement dietary changes. A thorough evaluation and understanding of psychosocial factors provides vital data on which

to base individual nutrition recommendations (e.g. economic status, occupation, educational background, living situation, stress level, cultural norms, alcohol or tobacco use etc.).

A brief medical history review should include but not be limited to gastrointestinal concerns such as gastroesophageal reflux, irritable bowel syndrome, inflammatory bowel disease, constipation, diarrhea, vomiting, or general discomfort, hyperlipidemia, diabetes mellitus, anemia, eating disorders (anorexia nervosa and bulimia nervosa).

The use of prescription and nonprescription medications should also be reviewed. The use of any nutritional supplements should be determined, because supplements can contain substances with allergenic potential.

Knowledge of typical eating patterns will enable the clinician to evaluate nutrition adequacy and to more successfully adapt nutrition recommendations to the patient's lifestyle. Factors to consider are: food preferences, including food avoided, number of meals eaten each day, typical meals, beverages, snacks, frequency of meals prepared at home and meals eaten out, special dietary considerations (e.g., vegetarian, low fat, kosher).

Dietary interventions should be carefully planned so that patients with food allergy continue to consume adequate amounts of energy and all essential nutrients. The Food Guide Pyramid and other guidelines could be useful for both clinicians and patients. They could be useful to promote an appropriate food selection from the key food categories and thus optimize nutritional status (5,6). Nutrient requirements for patients with food allergies are similar to the requirements for healthy individuals based on age. Particular attention should be paid to energy, protein, and fat intake in addition to particular vitamins, minerals, and trace elements for children with food allergies. Diet that omits sources of vital nutrients without adequate substitutes can cause malnutrition and result in further health problems.

Once a definite diagnosis of food allergy has been made, a strict avoidance of the offending food is of great importance. Depending on the severity of symptoms and reactions, however, the benefits of treating food allergy with dietary restrictions may be outweighed by the costs. Health workers who recommend dietary changes should be sensitive to the difficulty of such an endeavor. Exacting dietary modifications can require profound lifestyle changes, representing psychological, social and practical sacrifices to the patient (7,8).

As is true of other chronic conditions, the management of food allergy requires a multidisciplinary approach. Clinicians must coordinate care with

dietitians because of the prevention of nutritional deficiencies and retardation of growth.

There are strong medical contraindications to using an elimination diet as treatment. These conditions could include (1) excessive weight loss, (2) undernutrition, and (3) anorexia nervosa. Clinicians will be more likely to detect the existence of these potentially serious problems by taking a complete history and following the patients' progress during the diagnostic phase.

Potentially, there are many obstacles to changing dietary patterns. Sometimes, it is helpful to emphasize the types of food that can be consumed by the whole family - e.g., meat, potatoes, vegetables, and fruits. Financial concerns may be perceived. The presence of positive beliefs will foster behaviour change. Clinicians who address barriers to behaviour change and foster a sense of self-efficacy will have more success getting patients to follow dietary recommendations.

Strict elimination of the offending food allergen(s) is the key management strategy (9,10). Elimination diets should be undertaken with caution, especially if a significant number of foods or food groups are avoided, because several reports have documented inadequate caloric intake and failure to thrive (5). Therefore, it is important to identify exactly which foods need to be eliminated and to consider nutritional issues of a diet composed of the allowed foods over the long term.

Extensive instructions are imperative for patients requiring long-term dietary modifications. Guidelines must assure avoidance of allergens and promote overall health and well-being by following basic nutritional principles. Also, it should include a periodic review of symptoms and ongoing assessment of nutritional status.

The following checklist (Table 3) is useful for planning elimination diets with patients.

Suggested place to shop for such foods include supermarkets and health food stores. In Serbia, there is a lack of information about food choices and the management of food allergies available through pamphlets, books and networks.

Attention should be paid to the impact of any allergy diet on comorbid conditions such as excessive weight loss, anorexia nervosa, obesity, diabetes, or gastrointestinal disease (12). It is important to avoid confusion and contradictory recommendations. These situations call for highly skilled and specialized attention.

Education about issues that arise in undertaking dietary elimination, such as label reading, cross-contact, and selection of substitute foods is crucial for successful elimination. It could be helpful to have the family bring in labels and keep food/symptom diaries to help identify foods/

Table 3. Patient Guidelines for Maintaining a Nutritionally Balanced Elimination Diet

<p>The foods to be avoided are:.....</p> <p>The foods that can be eaten are:.....</p> <p>Concentrate first on the foods that can be eaten, rather than on those that must be avoided.</p> <p>Include sources of the basic nutrients by eating according to the Food Pyramid.</p> <p>Substitutes for favorite foods at breakfast, lunch, and dinner include</p> <p>Substitutes for favorite beverages include:.....</p> <p>Concentrate on the basics and keep meals simple. Meats, poultry, fish, vegetables, potato, rice, salads, and fruit provide excellent choices. Serve or request dressing and sauces on the side.</p> <p>Try new foods more variety.</p> <p>Be open minded-forego traditions for breakfast, lunch, and dinner foods if desired.</p> <p>Always read and evaluate food labels carefully.</p> <p>Make or buy large quantities of appropriate foods. Eat leftovers and / or freeze extras.</p> <p>Plan ahead for dining out and special occasions.</p>
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ingredients that are common in time to symptoms or that may be identifiable as tolerated.

Table 4. Alternative Foods Useful in an Elimination Diet

Milk substitutes: Beverages made from nuts, rice, soy
Starch substitutes:
Crackers made from rye, oat, rice;
Pasta made from corn, buckwheat, rice
Cooked grains: barley, millet, oat, buckwheat, rye, rice, potato
Legumes
Bread made from rice, soy, millet
Peanut substitutes: nuts, nut butters, sesame seed

Details such as the time of meal or snack, brand name if commercially prepared, specific ingredients if homemade, amount consumed, and symptoms should be recorded. Such a list, along with ingredient labels, may reveal hidden sources of the food allergen or unknown sources of contamination. Using alternative foods similar to what is recorded in the diet diary can also significantly enhance adherence to the restricted diet. For example, rice or

corn pasta would be a helpful substitution for a child who frequently eats wheat pasta and is to be placed on a trial of a wheat-free diet. Teaching parents how to replace the egg in the diet to provide an alternative source of nutrients lost through the elimination of egg from the diet is one example (Table 5).

Table 5. Egg allergy

Food to avoid: egg
Egg substitutes (equivalent to one egg):
1/2 tsp baking powder + 1/2 tsp liquid + 1/2 tsp vinegar
1 tsp yeast dissolved in 1/4 cup warm water
1 1/2 tsp water + 1 1/2 tsp oil+ 1 tsp baking powder
1 medium banana

Supplementation with appropriate amounts of calcium and vitamin D are important to individuals with milk allergy at any age. Another issue of concern for patients with multiple food allergies is the distribution of carbohydrates, protein, and fats in the diet. Modifications in food choices should be made to ensure sufficient macronutrient

and energy intake (12). For example, a grain-allergic child should be evaluated to ensure adequate intake of carbohydrates from alternative foods because sufficient intake of carbohydrates is necessary to prevent ketosis.

Detail information must be given to families or patient about label reading (understanding non-standard terms such as "casein" or "whey" that mean cow milk), concerns about cross-contact of food allergens in commercial processing and in food service such as restaurants, and the nutritional issues. Particular allergens may be hidden in the diet in unsuspected foods such as milk or egg proteins in bread products; milk or soy protein in canned tuna, so labels must be read carefully before serving food.

It is helpful to refer any person with food allergies to dieticians to provide family support, education, and counselling. Children tend to become less allergenic as they grow older, but family education is essential from the beginning. Management requires a multidisciplinary approach and follow-up (13).

To help identify and avoid offending foods:
allergy – specific lists that describe foods to avoid;
list key words for ingredient identification,
and
present acceptable substitutes that may be useful.

Success of elimination diets depends on adherence and nutritional adequacy, and both can be affected unless intelligent and creative choices are made to allow diversity of taste and texture in addition to nutrition. Sometimes the removal of even a single food protein requires that a large number of products with diverse nutritional and social advantage be excluded from the diet. For example, if the allergy is to wheat, then all commercial breads, cereals, baked goods, and pastas would be eliminated. Wheat is not only a main ingredient for a large number of products; it is also one of the common starches used in many processed foods. In this situation, the use of alternative grains (e.g., rice, oat, potato) as flour in baked goods may provide a solution. Use of commercial products with alternative grains such as crackers, cakes, and pastas made of rice, corn or potato can also provide normalcy and convenience to the diet of the allergic child on a wheat-restricted diet (Table 3, Table 4.)

The duration of the restricted diet also becomes an important factor in management. If the diet is modified for a short period for diagnostic purposes, then a complete evaluation may not be necessary. If the elimination diet is long-term, then a full nutritional assessment is essential.

A multivitamin and mineral supplement can

also offer a nutritional safety net. Unfortunately, most supplements, even those marketed as milk-free, may be contaminated with milk and create problems for the milk-allergic individual. Use of fortified infant cereals is another way to supplement the diets of children with multiple food allergies. Addition of even a single serving of this cereal to the restricted diet of the food-allergic child can provide several of the needed nutrients.

Prevention of food allergy in infants and children includes breast-feeding, maternal dietary restrictions during breast-feeding, late introduction of solids and the use of hypoallergenic infant formula. It has been documented that the presence of food allergens in breast milk is sufficient to induce reactions in infants (14). Milk and peanut protein were secreted into breast milk of lactating women after maternal ingestion of these foods. In addition, prophylactic restriction of some food allergens is suggested for infants at high risk for allergy.

Introduction of solid foods before four months of life has been associated with a higher risk of atopic dermatitis compared with delayed introduction. In addition, cereals can play an important role in replenishing the infant's iron stores, which are usually depleted between four and six months of age. Orange vegetables followed by fruits (apple, pear, banana, plum, peach, and apricot) can subsequently be introduced. Green vegetables (spinach, peas and green beans) may be added followed by grains (rice or oat, corn, white potato and wheat) and then meats. For infants at high risk of allergy, delaying the introduction of milk or soy until after one year of age; eggs until two years of age; and peanuts, tree nuts, fish, and shellfish until after three years of age has been recommended.

The physician plays a central role in identifying individuals with food allergy and for continued monitoring of these patients. For comprehensive nutritional management, the additional assistance of a dietician and an allergist in many cases could be useful:

For a definitive diagnosis (elimination diets, oral challenge);

When there are multiple maternal dietary restrictions during breastfeeding;

When food groups or multiple foods are avoided (especially without a complete formula);

To determine appropriate substitutions of allergenic foods.

CONCLUSION

Nutrition is an essential component in the diagnosis and treatment of food allergy, so diet recommendations should be based on careful

assessment.

The food-allergic patient is less likely to develop nutrient deficiencies or malnutrition when provided with appropriate food alternatives and careful monitoring while eliminating the food allergen(s), short or long-term, from the diet. The

nutritional management of food allergy requires education about dietary avoidance and consideration for nutritional deficiencies that may result.

The dietician is the most qualified professional to address the food-allergic patient's medical nutrition therapy needs.

REFERENCES

1. Chapman JA, Bernstein IL, Lee RE, Oppenheimer J, Nicklas RA, Portnoy JM. et al. Food allergy: a practice parameter. *Ann Allergy Asthma Immunol* 2006; 96(3), Suppl 2: 1-68.
2. Trevino RJ, Hamilton DS. Food allergy. Thieme, New York, Stuttgart, 1997.
3. Hourihane JO. Are the dangers of childhood food allergy exaggerated? *BMJ* 2006; 333(7566): 496-8.
4. Baral VR, Hourihane JO. Food allergy in children. *Postgrad Med J* 2005; 81(961): 693-701.
5. Moreno Villares JM, Oliveros Leal L, Torres Peral R, Luna Paredes C, Martinez-Gimeno A, Garcia-Hernandez G. [Growth in infants with cow's milk allergy][Article in Spanish] *An Pediatr* 2006; 64(3): 244-7.
6. Hon KL, Leung TF, Kam WY, Lam MC, Fok TF, Ng PC. Dietary restriction and supplementation in children with atopic eczema. *Clin Exp Dermatol* 2006; 31(2): 187-91.
7. Zivkovic R.: Dijetoterapija alergije i intolerancije na hranu-Vegetarijanska dijeta. U *Dijetoterapija*. Naprijed, Zagreb, 1994, 192-5.
8. Fiocchi A, Bouygue GR, Martelli A, Terracciano L, Sarratud T. Dietary treatment of childhood atopic eczema/dermatitis syndrome (AEDS). *Allergy* 2004; 59 Suppl 78: 78-85.
9. Mucoz-Lypez F. Controversies in food allergy. *Allergol Immunopathol (Madr)* 2006; 34: 43-5
10. Wahn U. Aspects of nutritional management of food allergy. *Pediatr Allergy Immunol* 2001; 12 Suppl 14: 75-7.
11. Glavnik V, Kuhar M, Porenta-Besic V, Accetto M. Alergija za hranu. In: Krzisnik C, ed. *Izbrana poglavlja iz pedijatrije*. Ljubljana: Medicinska fakulteta Univerze u Ljubljani, 1994; 57-62.
12. Takwale A, Cox J, Selwyn E, Charles-Holmes S. Food allergy diets - a cautionary tale. *Clin Exp Dermatol* 2002; 27(8): 715-6.
13. Sicherer SH. Food allergy. *Lancet* 2002; 360(9334): 701-10.
14. Pastar Z, Lipozencic J. Adverse reactions to food and clinical expressions of food allergy. *Skinmed*. 2006; 5(3): 119-25; quiz 126-7.

MEDICINSKA NUTRITIVNA TERAPIJA U KONTROLI ALERGIJA IZAZVANIH HRANOM

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SAŽETAK

Nakon postavljanja dijagnoze alergije na neku hranu, izbegavanje alergogenih namirnica je isključivi pravac uspešne kontrole. Cilj ovog preglednog rada bio je da objedini zaključke epidemioloških i eksperimentalnih istraživanja, kao i klinička iskustva u vezi sa dijetoterapijom alergije na hranu, kako bi se smanjio rizik od pojave malnutricija kod bolesnika sa alergijom na hranu. Materijali i metode predstavljaju pregled literature sa kliničkim pristupom, a prikazana su i lična iskustva autora. Efikasnost eliminacije alergogenih sastojaka iz hrane potvrđena je u 90% analiziranih studija. Kod bolesnika kod kojih postoji alergija na hranu ređe su prisutni nutritivni deficiti ukoliko uzimaju odgovarajuće alternativne namirnice, a tokom eliminacije alergena iz obroka važno je i valjano pratiti nutritivno i zdravstveno stanje. Kontrola alergije na hranu podrazumeva multidisciplinarni pristup. Osnovna strategija za kontrolu alergije na hranu je izbegavanje alergena, posebno kod dece. Identifikacija osoba sa rizikom može uticati na uspeh dijetoterapije. Treba učiniti što veće napore da se bolesnici edukuju u vezi sa pravilnim sprovođenjem dijete, a dijetolog je najkvalifikovanija osoba za sprovođenje adekvatne medicinske nutritivne terapije kod osoba sa nutritivnom alergijom.

Ključne reči: alergija, hrana, dijeta, kontrola