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A Nursing Approach to Food Allergies

Şenay Çetinkaya

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1. Introduction

It is known for more than 2000 years that foods give rise to negative reactions in the body. The first unexpected reaction of the body due to foods is the reaction to the cow's milk, as defined by Hippocrates [1,2]. In 1921, Prausnitz and Kustner defined the allergic reaction, for the first time, with their fish allergy model [2]. They injected the serum of the individual with fish allergy into the insensitized individual, after which they formed an edema plaque by applying the serum intradermally [1].

Single-blind placebo-controlled food challenge (SBPCFC) studies were released for the first time in 1950, while double-blind placebo-controlled food challenge (DBPCFC) studies were released in 1976 [1].

The incidence of allergies has become a matter of concern for the last 50 years throughout the world. Although the reason for this is the research subject of separate scientific fields, it has been quite important to define this ailment and to inform people about such a condition that has become sort of an epidemic today [3].

Even in England, where the social welfare level and the average level of consciousness / awareness are higher than the values in our country, the public awareness for the matter involved had not developed before the beginning of 1990s. In those years, the several ensuing deaths, the cause of which was based on food allergy, had drawn much of the media's attention. In the wake of those tragic deaths, the public opinion urged the government to take action on the matter, and within a short time, an alarming situation showed up in the food industry. On the same dates, about a thousand people came together under the roof of the institution called *Anaphylaxis Campaign* to share their experiences and to find out solutions to this situation. According to the records of that time, the majority of the patients consisted of children aged 15 at most (80%), whereas the nutrient that was complained most about was the peanut (85%). In the face of these figures, the English

officials prompted the involved ministries and the government agencies to take action for the purpose of carrying out researches and launching preventive programs. The records kept by the non-governmental organizations (NGO) during that time and the surveys performed so far give us information as to the course of these ailments [3].

Food allergy is defined as the reactions of the human body against food proteins, which occur through immunological mechanisms [4,5].

The prevalence of food allergy is associated with age and diet [2,5]. The incidence of food allergies has increased incrementally in recent years [4]. It is seen more frequently in the early years of a lifetime [2]. The burden of food allergy in the pediatric clinics is on the increase [6]. This ailment is seen in 6% of children and in 3-4% of adults [4]. Its prevalence in childhood occurs with the highest incidence in the early years of life [6]. On the other hand, the prevalence of food allergy among the those with atopic eczema (atopic dermatitis) is around 35% [1], while the food additive sensitivity in children is reported to be 0.5-1% [1].

The Center for Disease Control and Prevention (CDC) reported that the food allergy in children increased at a rate of 18% between 1997-2007 and that 3.9% of the children were affected by this ailment [2].

A systematic review by RAND Corp was performed by using pre specified criteria directed toward obtaining articles on epidemiological aspects of food allergy and resulted in the conclusion that food allergy affected from 1% to 2% up to 10% of the population [5]. Branum and Lukacs reported that in 2007, on the basis of the National Health Interview Survey response to the query, "During the past 12 months has [child] had any kind of food or digestive allergy?" 3.9% of US children were affected [5,7].

In the study where the children with food allergy who applied to HUMF (Hacettepe University, Medical Faculty), Children's Allergy & Asthma Unit between 2002-2007 were incorporated in the study with respect to the prevalence of food allergy, it was determined that the kids under the age of 1 were mostly allergic to cow's milk and eggs, whereas those aged 1 and above were allergic to hazelnut-peanut-walnut, meat, legumes (chickpea, lentil, peas) and fish [4]. In Adana, the incidence of cow's milk allergy until the age of 1 was found to be 1.5% [1]. While the great majority of early childhood food allergies, such as cow's milk, eggs, wheat and soy, clear up until the school age, 80% of peanut, fish and shellfish allergies continue throughout lifetime [4,8]. Besides the fact that the type of the nutrient is important in developing tolerance to nutrients, the genetic risk factors, such as an atopic disease within the family, and the factors like environmental and cultural dietary habits play a clinical role in the occurrence of food allergies [4,5,7-10].

The prevalence of food allergies has been on a continual increase in recent years [4,7]. A study conducted in the USA has suggested that the peanut allergy in children has doubled within five years. According to the routine patient records in England, the incidence of anaphylaxis has increased 7 times more, while the food allergy increased 5 times more during the past 10 years. It was shown that 56% of those with anaphylaxis treated in the emergency departments in Australia were due to food allergy [4]. These conclusions clearly show that food allergy is

a significant public health concern [6]. Today food allergies in the western countries are regarded as a public health issue [4].

Foods may cause many various undesirable reactions and diseases, which may sometimes be fatal [4,7]. Almost 20% of the society change their diets due to an undesirable reaction developing against foods. These undesirable reactions occur due to an immunological response to a food protein (e.g. food allergy), a metabolic disease (e.g. lactose intolerance, galactosemia), pharmacological response (e.g. nervousness due to caffeine, headache due to tyramine within cheese) or toxic reactions (e.g. bacterial food poisoning) [4].

In 2001, The European Academy of Allergy and Clinical Immunology (EAACI) reclassified the hypersensitivity reactions due to foods according to their pathogenesis. All the non-toxic harmful food reactions observed after the intake of foods/nutrients were referred to as **food hypersensitivity**. If the reaction occurred through an immunological mechanism, then the term, 'food allergy' was used, and if the presence of IgE was shown, then the term, "**IgE-mediated food allergy**" was used. The reactions also defined previously as the food intolerance were named as the **non-allergic food hypersensitivity** [4]. Although each nutrient may cause a reaction, a few nutrients are partially responsible for most of the important allergic food reactions, which can be sorted as milk, eggs, types of nuts, peanut, fish and shellfish [4]. The most allergic foods in children are the cow's milk, eggs, nut, peanut, fish and tomatoes [1].

Food Allergens: The factors giving rise to food allergens despite the consumption of many varieties of foods are generally limited in number. Food allergens are grouped in 2 classes [4].

First Class Allergens: These are the main sensitizing allergens, and the most important food allergens fall within this group [4]. Resistant to heat, acid and protease, food allergens are the water-soluble substances with a glycoprotein structure, the molecule weight of which is 10-60 kD [1,4].

The allergic reaction to these foods/nutrients develops after the oral food intake. The cow's milk, eggs, peanut, soy, shrimps and lipid transfer proteins (apple, apricot, peach, plum, corn) fall within this group [4].

The Second Group of Allergens, on the other hand, are mostly vegetative proteins (profilins). Since their temperature-sensitive structures can be easily spoiled, it is difficult to isolate and keep them for a long time. Most of the vegetative allergens within this group show a structural similarity to the proteins associated with the pathogens in most pollens, profilins, peroxidases and peroxidase inhibitors [4].

Any nutrient can be an allergen. The cow's milk is a significant allergen during childhood which provides the earliest finding in this matter. There are at least 20 proteins in a cow's milk, the most important allergenic protein of which is the Beta lactoglobulin (β -Lactoglobulin). It is of a more allergenic character when compared with the egg white (albumen) or egg yolk (duetoplasm). The ovomucoid in the egg white (Gal d 1) is the most important allergen of all. The other egg allergens are ovalbumin (Gal d 2), ovotransferrin (Gal d 3) and lysozyme (Gal d 4) [1].

Severe or fatal food anaphylaxis can be seen at any age, even in the first confrontation with the nutrient. However, the adolescents with asthma or young adults who allergic to peanuts,

hazelnuts and sea products are at greatest risk in terms of fatal food anaphylaxis. The incidence of food allergies is associated with age. In the USA, food allergy was determined in 8% of the kids under the age of three, 6% of those in their school age and in 3.7% of the adults. The types of food that cause allergies most frequently are also associated with age. In the USA, the most common allergies determined in little kids were those related with the cow's milk (2.5%), eggs (1.3%), peanut (0.8%), wheat (0.4%), soy (0.4%), tree nuts (0.2%) and fish (0.1%). The allergies related with shellfish (2%), peanut (0.6%) and fish (0.1%) are seen in adults more often. The reactions to fruit and vegetables are also common with approximately 0.5%; yet, these reactions are usually not serious. Seed allergies, such as sesame, are reported to be seen more and more frequently [4]. It seems that the sesame seed will be recognized more and more in terms of allergies [11].

The allergic diseases triggered by foods/nutrients occur through the pathway of cell-mediated reactions that cause an acute or subacute inflammation through medium of the pathway of food-specific IgE antibodies and the activation of the effector cells, or through the simultaneous activation of the effector cells by both of the pathways [4].

1.1. The conditions in which cross-reactivity is observed among food allergies in clinics and the cross-reactivity risks

1. Among the Botanical Families:

- Legumes: Reaction Risk for another legume is 5%.
- Cereals: Tahillar: Reaction Risk for another cereal is 20%.
- Tree Nuts: Reaction Risk for another type of nut is 37%.
- The Risk of Cross-Reaction among Rosaceae Fruits is 55%.

2. Among the Types of Food:

- Fish: Reaction Risk for another type of fish is 50%.
- The Reaction Risk among Shellfish is 75%.
- Cow's Milk: Reaction Risk for bovine meat is 10%, while it is 92% for goat's milk.

3. Food/Nutrient-Pollen: The Reaction Risk for any fruit/vegetable through pollen allergy is 55%.

- Birch Tree: Apple, carrot, cellery, raw Potato, chestnut.
- Grass: Tomato, potato, cherry, peach.
- Ragweed: Melon, Banana.
- Artemisia: Cellery, apple, peanut, kiwi.

4. Food/Nutrient-Non-Pollen:

- Latex allergy: Reaction Risk for Fruits (banana, chestnut, avocado, kiwi) is 35%.

- Fruit allergy: Reaction Risk for Latex is 11% [4].

Foods/Nutrients produce various symptoms in the cutaneous, gastrointestinal and respiratory systems through IgE-mediated and Non-IgE (cellular) mechanisms [4,12]. There are still several studies conducted in order to figure out how the normal oral tolerance disfunctions and the food allergy occurs [4].

The mucosal barrier in the gastrointestinal system, enzymes, peyer's plaques in the intestinal wall, cells providing antigens and T and B cells have a significant role in the development of food allergies. On the other hand, there is the intestinal/bowel barrier which hinders the development of food allergies, and there are mechanisms referred to as oral tolerance, which prevent the development of immune response to food antigens in the bowel [4].

The intestinal flora is formed within the first 24 hours of life and remains stable throughout lifetime; the maternal flora is dependent on genetic and local environment [4].

Food allergies occur in the genetically susceptible individuals as the result of the failure of the oral tolerance to develop normally or the disfunctioning of the oral tolerance [4]. Food allergy reactions are described by Gell-Coombs Hypersensitivity Reaction; however, food hypersensitivity is a much more complicated reaction [1]. In food allergies, not only the humoral immune response but also the cellular mechanisms play a significant role [4,12]. Type I hypersensitivity reaction develops through **IgE**. As the result of the dysfunctioning of oral tolerance or its failure to develop, **specific IgE antibodies are performed within the nutrient**, and they join the high-affinity receptor, FcεR1 in **the mast cell and basophils**, or the low-affinity receptors on the **monocyte, macrophage, lymphocyte and eosinophil**. Food allergens reach the antibody that passes through the mucosal barrier and joins the Fab section. In consequence of this connection, the mast cell is activated; histamine, prostaglandin and leukotrienes are released, and these released/oscillated mediators lead to vasodilatation, smooth muscle contraction and mucus secretion in various tissues and organs. This is the early hypersensitivity reaction, which takes place within minutes. From this activated mast cell, various cytokines, such as **IL-4, IL-5, IL-6, IL-13 and PAF** are released/oscillated, which produce a **late allergic reaction of IgE origin. Neutrophils and eosinophils reach the scene in 4-8 hours**. The mediators, including PAF, bring about the release/oscillation of peroxidase, ECP and EBP. **Lymphocytes and monocytes are responsible for the chronic inflammation that occurs within 24-48 hours**. Some part of the nutrient-based reactions is the food hypersensitivity of non-IgE origin [1].

Th2 phenotype is found in atopic patients and the IL-4, IL-5, IL-13 and IgE antibody formations against unknown proteins increase [2].

1.2. The classification of food allergies

Food allergies are classified according to the immunological mechanisms and the involvement of the organ systems playing a role in the process [4,10].

IgE-mediated food allergies with acute onset:

Skin: Rash (Urticaria), angioedema, morbilliform skin eruption/rash and flush in the face.

Gastrointestinal: Oral allergy syndrome, gastrointestinal anaphylaxis.

Respiration: Acute rhinoconjunctivitis, bronchospasm (wheezing)

Generalized: Anaphylactic shock.

IgE associated/cell-mediated, late-onset/chronic food allergies:

Skin: Atopic dermatitis

Gastrointestinal: Allergic eosinophilic esophagitis/gastritis/gastroenteritis

Respiration: Asthma

Cellular-mediated, late-onset/ chronic food allergies:

Skin: Contact Dermatitis, dermatitis herpetiformis

Gastrointestinal: Food Protein Enterocolitis

Food protein proctocolitis

Food protein-induced enteropathy syndromes

Celiac Disease

Respiration: Pulmonary hemosiderosis (Heiner's syndrome)[4].

Today a number of allergens contained within the nutrients/foods have been defined on a molecular level and synthesized. The immunopathogenesis of food allergies have been understood better, as the result of which new approaches of diagnosis and treatment can be put forward soon [4,13].

2. Food allergy clinic

An allergic reaction occurs in various organs through the foods/nutrients taken in, the most severe form of which is anaphylaxis. There may be atopic dermatitis, rash, angioedema, flushing and itching on the skin; while in the gastrointestinal system, swelling in the lips, tongue and palate, flushness, oropharyngeal edema, laryngeal edema, vomiting, diarrhea, upper and lower respiratory tract problems, wheezing, coughing and nasal congestion can be seen [1].

As the result of the food allergy, the following clinical symptoms can occur, apart from the condition of anaphylaxis [14] :

Digestive system:

- In-mouth sores
- Itching on the lips, tongue, palate and throat, sense of tickling, metallic taste
- Swelling in the lips and tongue

- Hoarseness
- Sense of jamming/congestion in the throat
- Nausea, vomiting
- Cramps
- Abdominal Distension
- Diarrhea, greasy-mucus (slimy) excrement/stool
- Bloody Excrement/Stool
- Constipation
- Gastro-oesophageal reflux

Skin:

- Itching
- Rush, hot flush
- Itchy/Scratchy water-logged rashes
- Swelling in the eyes, hands and feet
- Rash (Urticaria)
- Allergic Eczema

Respiratory system:

- Nasal Congestion, itching, sneezing, nasal flow
- Warbling in the throat (Stridor)
- Coughing
- Wheezing in the chest
- Sense of chest tightness, shortness of breath (dyspnea)
- Asthma

Eyes:

- Itching and watering of the eyes.

Systemic:

- Anaemia
- Loss of appetite (anorexia)
- Retardation in growth and development, loss of weight
- Decrease in Blood Pressure

- Black-out / Loss of consciousness, fainting.

There may be clues as to whether the food is taken in outside home or when it is taken in. For instance, egg rings in an Asian restaurant may contain eggs, peanuts and/or shrimps. The cross-contamination potential of the foods consumed in snack bars, ice cream shops and bakery/patisseries is quite high [11].

The Second Disease Along with the Major One: The risk of developing food allergy in young children with atopic dermatitis is higher, particularly more serious and resistant to treatment, than that in the babies and those with intracutaneous reactivity in the toddler period. In general, the factors that may cause food allergy in younger patients and in those with more severe atopic dermatitis are more likely to be seen [11].

In particular, the food diaries in chronic patients would be of help in terms of their medical history [4]. Therefore, the patients should be allowed to keep diet diaries [1], in which the patient should note whatever s/he eats and drinks, along with the time of intake. In addition, they should also point out the type of the symptoms, and when and how often they occur in those diaries. If several distinct problems pop out, they should pick out two or three of the symptoms perceived as the worst ones. This may generally require a few weeks to perform [14].

The clinical history is of great value in acute food reactions (anaphylaxia, urticaria, etc.). On the other hand, this value in the chronic cases, such as atopic dermatitis, asthma and eosinophilic gastroenteritis, is rather low [1].

In the physical examination, the focus should be directed to the cutaneous, gastro-intestinal and respiratory systems, and atopic findings should also be sought [1].

After having acquired the medical record carefully to establish a diagnosis, the diagnosis is finalized through the laboratory studies, elimination diets and food provocation tests later on [4].

In fact, when double-blind placebo-controlled food challenge (DBPCFCs) is used in the diagnosis of IgE-mediated food allergy, the diagnoses of almost 40% of the nutrient-based reactions which were likely to be in various forms in the past could be verified [11].

While the possibility of the positive skin test to indicate food allergy in a patient is less than 50%, the possibility of the negative nutrient/food allergy test to indicate no food allergy in a patient is 95% [1].

Other similar in vitro studies, including RAST and ELISA, are significant scanning methods to determine the reactions of IgE origin in the serum, specific to the allergens but less sensitive than the skin test. RAST test should be preferred to the skin test in those with positive dermographism, in the patients regularly taking antihistaminics and in those with severe skin disease [1].

The elimination diet is used for the purpose of diagnosis and treatment. When an acute reaction (such as rash and anaphylaxis) caused by nutrients occurs, the nutrient in question has to be immediately eliminated from the diet. The remission of the reaction and the positive outcome of the skin test through that nutrient indicate that the nutrient in question plays a role in this reaction. In elimination, the growth of the baby should be followed-up with great care. When,

in milk elimination, there is recovery through diet, then the lactose intolerance should also be taken into consideration. The oral food challenge test is a major method of diagnosis in the identification and diagnosis of food allergy, which is performed in 3 ways:

1. Open; the doctor and the patient have the knowledge of the loaded food content.
2. Single-blind placebo-controlled; the patient is not informed about the loaded food content, except for the doctor him/herself.
3. Double-blind placebo-controlled; neither the doctor nor the patient knows anything about the content of the loaded substance [1].

3. Prognosis

The clinical tolerance in some foods (milk, eggs, soy, wheat) may develop more frequently than that in the others (peanut, tree fruits, sea products). In the former studies, the tolerance rate for milk and eggs between the ages 3 and 5 was reported to be 80%. More recent retrospective studies put forward in the study from John Hopkins Pediatric Allergy Clinic the resolution rate of those aged 16 with cow's milk allergy as 79% and the resolution rate of those aged 16 with egg allergy as 68%. This generalization may not be reflective on the society since there are also academic centers full of patients with more severe conditions, who are more resistant to the disease. On the other hand, almost 20% of little kids develop tolerance against the peanut, and less than 10% of them recover from the tree nut allergy [11].

4. The treatment

The most important method in food allergy is the elimination. The elimination diets may lead to malnutrition, and nutrition and eating disorders, thus, great care must be taken in this matter and a proper nutrient must be replaced with the one in question. Yet, some problems are confronted when more than one food allergy occur. The medications used in the treatment are antihistaminics (H1, H2), ketotifen, cromolyn sodium, corticosteroids, and prostaglandin synthetase inhibitors. Adrenaline becomes a life-saving factor when needed. It is used in the oral corticosteroid chronic reaction of IgE origin (atopic dermatitis, asthma) and in gastroenteritis of non-IgE origin (allergic eosinophilic esophagitis, gastroenteritis, the enteropathies occurring through diet). The oral chromolyn is used in the IgE-origin food allergy and allergic eosinophilic gastroenteritis, however, its efficiency has not been fully put forth [1].

The ability to identify the common allergens in the commercially prepared USA foods has become easy thanks to the laws in effect. *Food Allergen Labeling and Consumer Protection Act (FALCPA)* (by January 2006) (milk, eggs, soy, wheat, peanut, tree nuts, fish and shellfish) makes it obligatory for the substances derived from the common allergic sources to be labelled in English [11].

5. The self-injectable epinephrine (Adrenaline) indications

Children diagnosed with food allergy carry the risk of an immediate reaction once they are exposed to an allergic nutrient [8]. Since anaphylaxis may develop in the wake of the allergen exposure, it is advised that the patients be prescribed an epinephrine auto-injector in order to be able to do it by themselves, because the antihistaminics do not prevent the systemic reaction. In particular, it should be administered to those with the risk of developing fatal food anaphylaxis and to those with asthma and/or those suffering from tree nuts, such as peanut or hazelnut [10,15].

Epinephrine is a method of treatment clearly preferred for anaphylaxis. It was introduced and recognized in 2006 and was then put on the market. If there is any doubt of exposure to an allergen, then epinephrine should be applied in the event that an allergic reaction occurs right after two or more exposures (within a few minutes or a few hours) stated below :

- Skin or Mucosal Involvement (e.g. Common rash (urticaria) or the swelling or blistering of the oral mucosa.)
- The risk of Inadequate Respiration (e.g. Dyspnea, wheezing, stridor).
- Permanent gastro-intestinal symptoms (e.g. Vomiting).
- Hypotension (e.g. Hypotony, syncope). [10].

Undoubtedly, an epinephrine application and administration is an indication in a kid known with his/her hypotension symptoms (and even without accompanying symptoms) and food allergy in particular. When indicated, epinephrine is injected intramuscularly, preferably on the lateral of the femur. The plasma concentration of the high peak value of epinephrine/adrenaline was demonstrated by the injection into vastus lateralis when compared to the deltoid. Moreover, the adrenaline plasma peak time concentration is 8 ± 2 minutes after injection, however, it takes much longer (34 ± 14 minutes) after the subcutaneous injection. The rapid administration of epinephrine is fundamental, since the respiratory or cardiac arrest period in those with anaphylaxis triggered by a nutrient is 30 minutes [15].

EpiPen and Twinject can both be used in two doses. The dose recommended for pediatric use is 0.01 mg/kg body weight. 0.3 mg dose is suitable for the patients close to 30 kg and above. The dose for the kids around 15 kg is indicated to be 0.15 mg. On the other hand, the clinical decision of the physician must be taken for the little kids (<10kg) and for those weighing between 15-30 kg [15].

When epinephrine is prescribed, it may appear to be non-applicable. However, the demonstration/ instruction of its application or training on it is a significant factor in encouraging patients for the use of epinephrine auto-injectors. The doctors are advised to demonstrate how to use these auto-injectors (preferably, via a placebo device) as well as giving verbal information [10,15].

The usual epinephrine dose is 0.01 mg/kg, and 0.5 mg (if required) at most can be repeated 5-30 minutes later. The approximate dose when the weight is unknown is 50 mcg (0.05 mL); for babies younger than 6 months, it is 120 mcg (0.12 mL); for those between 6 months and the age of 6, it is 250 mcg (0.25 mL), whereas the appropriate dose is 500 mcg (0.5 mL) for those aged between 6-12 and above. The injection must be performed intramuscularly through the femur. Training the health personnel and instructors in this matter is also necessary to avoid inadequate/partial use [6].

It has been estimated that food allergy and anaphylaxis alliance in USA is responsible for 200 deaths and 2000 hospitalizations in a year including but not limited to deaths and hospitalizations; 30.000 case for a year in all. The risk of anaphylaxis in children and the possibility of its recurrence due to a nutrient occur every other year, during which the attacks course with 0.6%-5 % mortality. With the diagnosis of food allergy, the anaphylaxis developing in children can be prevented. The deaths due to food anaphylaxis occur mainly away from home, and more public awareness for the matter involved will reduce the problem in question [6].

The pediatrician should perform 4 actions when the diagnosis of a possible fatal anaphylaxis is established:

- S/he should prescribe an epinephrine injector and describe how to and under what circumstances to use it.
- S/he should provide a plan of action in case of an emergency for the patient and the caregivers in the school, sports and other social activities.
- S/he should provide information as to the possibility of reaction occurrences and proper preventive and recovery measures.
- S/he should be advised to put an identification label on for a medical warning [6].

Antihistaminics, beta-agonists and systemic corticosteroids can be used as an adjuvant treatment for anaphylaxis. However, they should not be applied instead of epinephrine, since it has not yet been proved whether it reverses the respiratory or cardiovascular symptoms. Antihistaminics can be tried at the onset, and if the symptoms merely involve the skin (including the oral mucosa), the kid in question should be followed-up more closely in terms of the development of symptoms [15].

6. The prevention of atopy in brothers and sisters or children

Parents may often ask how they should prevent allergies in their children in the future. In 2008, the American Academy of Pediatrics (AAP) released a clinical report for the children with high-risk atopic development. The children with a high risk of allergy development were defined as: "There is a first-degree relative/relation (parents or brother/sister) with an allergic disease in the family circle of at least one of the children" [4]. The following suggestions are based on scientific facts and evidence in the prevention of food allergy and atopic dermatitis:

1. Breast-feeding for at least 4 months reduces the incidence of cow's milk allergy and atopic dermatitis in the first 2 years of life when compared with feeding on through the formula of cow's milk protein.
2. Atopic dermatitis can be held up or prevented with the common use of hydrolysis in early childhood or the partial use of hydrolyzed formulas when compared with the cow's milk formula within it. Common hydrolyzed formulas may partially be more effective than the partially hydrolyzed ones in terms of prevention, yet, the economic cost is significantly higher.
3. The soy-based formula has no role whatsoever in the prevention of allergy, and the amino acid formulas have not been studied in terms of preventing atopy.
4. Solid foods should not be taken in before 4-6 months. At this age, sufficient evidence lacks for dietary supplements at the time of intervention [15].

These suggestions are not valid for the patients whose atopic diseases like atopic dermatitis or food allergy have already developed [15].

There are a Few Problems in Diet Therapy:

- The child may be highly sensitive to the insignificant amount of food, and other modes of transmission must also be taken into account as some sort of substance used commonly in other foods may be the trigger for it.
- In addition to swallowing foods, skin contact and inhalation may lead to severe reactions; avoiding the external contacts and inhalation is generally essential.
- Cooking, especially at industrial nutrition, is a heat treatment process, raw food is able to be tolerated by sensitive person, so cooked (not raw) food avoidance may not be necessary in many cases.
- A simple elimination diet may be relative due to the fact that most of the allergic triggers and proteins of nutritional value can be found anywhere when the blameful food has been consumed [6].

Surprisingly, there are a few studies evaluating the effects of the elimination diet. The main concern of pediatricians may be the developmental delay in the children with allergies, particularly those with atopic dermatitis. According to a hypothesis, suppressing growth during infancy may indicate negative consequences in the years to come. Nevertheless, it is not yet clear whether the disease itself, the restricted diet, genetic factors or some combinations are the causes or not. Whatever the case may be, arranging the diet according to the babies and kids with food allergies require a more careful evaluation of the nutritional aspect on an individualistic basis. There is a consensus in the literature of food allergy, which is: " Extensive elimination diets need to be utilized only as a means for diagnosis for a short while.", and " It is quite important that a balanced diet containing proteins, calories, trace elements and vitamins be maintained.". This is particularly appropriate for the babies with cow's milk allergy. These babies should be provided with nutritional requirements, a balanced calorie-protein rate, aminoacid compound and adequate amount of calcium intake [6].

In most babies, the clinical reaction to foods ends once they reach their toddler period, thus, 90% of the babies with cow's milk allergy can tolerate milk towards the end of their 3rd years. However, half of their peers with egg allergy will not be able to get through to the same age. The peanut or codfish allergy in more than 80% of the patients still continue. The allergy or the food allergy perceived by parents may also be effective in the development of healthy nutritional habits. This transition period clinically requires the patients's review of avoidance strategy with his/her parents and periodic clinical revision of all the dietary interventions/ attempts [6].

The American Academy of Allergy, Asthma & Immunology (AAAAI), Food Allergy Practice Parameters (2006) characterizes the immunotherapy for food allergy as "empirical" and states that it should be recognized as a clinical option. However, researches still continue, while the recombinant allergens or synthetic peptides appear to be more promising [6].

7. Labelling the processed foods

Labelling is a subject associated with food allergy, and it is the risk factor modified when the processed food, prior to packaging, is exposed to allergens by mistake. The laws in the European Union until recently did not give permission for the complicated contents listed on the labels on condition that they did not exceed 25% of all the products. Hence, the term "crémé" could be read on the label regardless of a clear indication of eggs as the combination of a sandwich/snack. Following the labelling guidelines in September 2001, this respect was extracted from the guideline in 2005. The law makes it a condition that the contents of 12 nutrients appear on the label: **eggs, peanut and tree nuts, soy, cow's milk (containing lactose), mustard, sesame seeds, celery and the amount of sulfides more than 10 mg/kg**. Similar laws now effect the USA. In the beginning of 2006, Food Allergen Labeling and Consumer Protection Act makes it mandatory that the specifications for the ingredients be indicated on the labels of all food products. Once, the latent allergens were not labelled, since they were the additives free of the existing ingredients/specific labelling (e.g. Colour and aroma/flavor); however, if, from now on, they contain one of these 8 nutrients, they will need to be described then; therefore, most of the problems regarding the unlabelled/latent allergens in foods will be *eliminated* [6].

8. Food allergy: Nutritional respects for the primary care providers

With the prominent increase in the prevalence of food allergy among children, the pediatricians must figure out how to follow-up the dietary status of these kids. Parents, particularly when the child requires a restricted diet, are typically dependent on the primary pediatrician in order to follow up their kid's growth and development. The role of an allergist is to provide the diagnosis and method for food allergy as well as the initial training and guidance. However, it may be beneficial to acquire further supportive and accurate information from the

pediatrician who is often in contact with the family regarding inadequate nutrition and dietary management. A dietician experienced in food allergy and children can be an ideal person a family confers with; yet, this option may not be available in all the geographical regions [16].

9. The nutrition assessment in primary care

To date, the sole treatment for food allergy is to totally eliminate the food(s) that give rise to complaints. Potentially, due to the restrictive nature of avoiding any nutrient/food, the diagnosis method proven for the children with multi-food allergy in particular is quite important. If no reliable food allergy test has been performed or if it is restricted on the basis of the reports/information provided by parents or their own beliefs, the child may be at an unnecessary risk in terms of inadequate nutrition. Once a reliable test has been performed, the training on the foods to be avoided and foods in general should be provided, as the result of which the pediatrician can start the nutritional follow-up process [16].

10. Result

- Since the elimination of food products from the food may be both practically and nutritionally rather challenging, it is important that the diagnosis be established on an accurate basis.
- A distinction between the allergic reactions against food products and the hypersensitivity against nutritional compounds should be made.

Among the common food allergens are the peanut and tree nuts, egg white, sesame, cow's milk, legumes, soy, fish, shellfish and wheat. Although not directly, the consumption of other products in which these nutrients are added, or the products coming from the production line where those nutrients are processed cannot be considered clean in terms of allergy and unreliable/unhealthy for patients, towards which several countries are developing policies [3].

Food allergy has become a great social health issue throughout the world. With further awareness in the matter, the increase in the incidence is inevitable. Besides, the western pre-school nurseries, primary schools, secondary education institutions and public enterprises have constituted private programs and regulations to be able to cope with this issue [3,10].

The Responsibilities of Parents:

- To inform the school about the allergic condition of the student.
- To develop a plan to meet the requirements of the student within school, in the cafeteria, during the treatment in the wake of the disease, in school activities and in school service buses, etc. by working together with the school administration.
- To provide health documents, prescribed medications and the instructions for use as well as attaching the picture of the child to the involved folder.

- To supply accurately-labelled medications as well as renewing them after their usage and expiry date.
- To train the child in the subjects regarding food allergy as stated below:
- Safe and risky foods
- Preventive resorts/remedies for accessing risky foods.
- Symptoms of allergic reactions.
- The time and the way of informing the adults around about the developing allergic reaction.
- Reading the food labels.
- To review the current regulations or rules together with the school management, the physician responsible for the kid and the kid him/herself in the event that a reaction occurs.

To provide a contact info in case of an emergency [3,10].

The Responsibilities of A School:

- To have the knowledge of the involved regulations, and to have the capacity of perceiving and applying them correctly.
- To have already examined the health files from parents and physicians.
- To incorporate the students with food allergy in school activities.

To constitute a "preventive plan" by forming a skeleton crew consisting of a school nurse, a teacher, school manager, an administrator of food and nutritional services, and a school counselor and incorporating them in the food allergy management together with the student and his/her parents [3,10].

The Responsibilities of a Student:

- S/he shall not exchange foods with other students.
- S/he shall not consume foods with the content of allergens or foods with unknown content.
- S/he shall co-operate in the management of food allergy and in treatment processes.
- S/he shall immediately inform his/her family for the matter involved as soon as s/he realizes that s/he has consumed some food known to be allergic.
- Ultimately, the guidance provided by an allergist and a dietician, the association of allergic patients, and their feedback would increase the life quality of both the child and his/her parents.
- Further studies regarding the empowerment of children through training and the long-term impact of the elimination of a nutrient from the diet in terms of food allergy are required to be conducted.

The role of the pediatrician will have been fulfilled in this center with the suggestion made by a dietician [3,10].

11. Protection

Babies with the risk of atopy are those in whose family circle the mother, father or at least one of the brothers or sisters has a medical record of an atopic disease, such as asthma and allergic rhinitis [17].

As in all the health issues, protection is the leading approach in allergic diseases, as well. There are a number of studies researching into what could be done to prevent the disease in babies at risk, among which the protection from the allergens in the cow's milk has a significant place. The superiority of breast milk is indisputable in terms of both nutrition and protection. Thus, while the cow's milk or alternative diets are being discussed, they are always assessed according to breast milk. With quite an extensive cohort study about 70 years ago, Grulee and Sanford compared the babies fed on breast milk with those fed on mixed diet and suggested that the risk of eczema increased 9 times more with normal cow's milk [17].

Feeding a baby through breast milk prevents the development of an atopic disease. If an atopic heredity is involved, such a preventive feature becomes more prominent. If there is no breast milk or only an inadequate amount, a totally hydrolyzed baby food should be selected. Non-hydrolyzed or less hydrolyzed baby foods are risky in terms of atopy. It was seen that the risk of atopic dermatitis decreased at a rate of 50% in the first years of the lives of the babies at high risk who were fed on baby foods containing a totally hydrolyzed casein in the first 6 months [17].

Encouraging people in feeding babies who are at high risk and who have already food allergy through breast milk as well as other protective approaches and as early diagnosis and accurate treatment as possible are the steps to be taken for a healthy life-style [17,18].

12. Probiotics

Since human beings first existed on the Earth, they have been living with other creatures in an environment called the *nature*. The gastrointestinal system ensures the relationship of the human beings with the outer world. It is the inner side of us, but in fact, it is the outer side or the *universe* inside us. By taking the food and drink through our mouth, we send the bacteria that are the invisible creatures of the nature to our digestive system. Most of these bacteria are friendly bacteria. Those that survive the gastric acid, gall and pancreas enzymes continue their routes until the digestive system and connect or stick to the receptors there and start to live with us and become an integrated part of us [18].

These bacteria that ensure that we live healthily and protect ourselves from diseases and help us in treatments when they are taken in sufficient amounts are called PROBIOTIC BACTERIA. When the birth of a baby occurs via the vaginal method that is foreseen by the nature, the baby takes all the bacteria from the mother's colon and vagina flora through its mouth. These bacteria belong to the mother's flora and some of them (for example *Escherichia coli*) may be risky for the newborn. If the mother starts to breastfeed the child in the possible shortest time, the carbohydrates (prebiotics) in the form of galactose-oligo-saccharide that are existent in the

mother's milk (i.e. prebiotics), are broken down by these bacteria. After this process, an energy coming from the short-chain fatty acids is obtained; and with this energy, the bacteria that are necessary for the child at that age-mainly the bifido-bacterium and lactobacillus group bacteria-start to grow in a fast pace (bifidogenic effect). At the end of the first week, the bifido-bacteria dominate in the 70-80% of the flora. The bacteria such as *E.coli* that may be risky for the child are suppressed and minimized in number [18].

Furthermore, essential fatty acids such as acetate, butyrate and propionate contribute to the development, in one sense, close the ranks of colonocytes and enterocytes and prevent the migration of pathogen microorganisms and macromolecular foreign proteins from the lumen to the system. These essential fatty acids act as important energy sources for the functional development of the brain and liver [18].

Vaginal birth and the breast milk as soon as possible after the birth are the most important steps of the nature in the healthy life program of the human beings. Contrary to these steps, the babies who are born via caesarian method and/or the babies who cannot be fed with breast milk cannot start life in a healthy way, and these babies have relatively more allergic and inflammatory diseases [8,18,19].

13. The role of a nurse

In a nursing practice, the key role of a nurse is to provide consultancy, information and trust/security. A nurse provides information for the child, the youth and their families regarding other health issues, including the suspected type of allergy, its severity, the risk of an allergic reaction and the possible effects of a suspected allergy, on the basis of the allergy-oriented medical record of the child or the young patient [20].

A nurse, with a feasible plan, can also cover parents' lack of knowledge of the succeeding steps in achieving a final diagnosis that may involve the procedures of an elimination diet after performing skin tests and specific IgE antibody test. To provide adequate nutrition for babies and mothers, it is important that an awareness for requirement be maintained for alternative sources [20].

It cannot be expected of a nurse and/or a physician to become a specialist overnight on the diagnosis and management of allergy, considering the insufficient education and training provided for them in this matter. Nevertheless, it is crucial to become aware of the conditions to be suspected of food allergy and to take the necessary precautions in this respect [20].

Allergies are frequent, serious allergic reactions are less common, anaphylaxis is rare, so nurses should be aware of how to deal with anaphylaxis and management of these cases. More frequently, the primary care nurses will encounter children under such conditions as suspected allergy or the circumstances with an allergic component. The majority of those with an allergic disease can be cured in the first step/level, however, it is important that nurses and patients be in the know and aware of the local ways of referral in such applications [10,21].

14. Patient and/or parent training

Cow's milk allergy is the type of allergy which is most commonly seen in little children. What causes a reaction in the cow's milk allergy are the proteins within the milk. The treatment of milk allergy means the total removal of the milk. The milk obtained from goats, bisons and as such should also be avoided. Apart from what we refer to as the classic dairy products, the milk protein can be found in many food products, as well. Therefore, it is important to always read the product description very carefully in order to understand what products are safe to consume. It should also be kept in mind that the milk protein in the content list is defined sometimes as casein or curdled milk [22].

The substitutes for milk are the milk protein-based products hydrolyzed (broken down) at high degrees. NAN HA contains milk protein and is not suitable for those with cow's milk allergy. It should be taken into consideration that numerous substances to be substituted for milk are not totally valuable in calcium content [22].

In older children, the soy beverage rich in calcium or oat beverage that can be bought in the markets are the suitable ones to be substituted for milk. Rice drink is less valuable in terms of nutritional value. There are a number of soy, oat, rice or palm oil-based products that can substitute for cream, cheese, yoghurt, ice cream, butter, etc., which provide practical solutions in cooking; yet, their nutritional values vary. Other foods of animal origin, such as meat, poultry, fish and eggs, can usually provide the protein of high value obtained from milk [22].

Lactose intolerance means that purchasing rich products with milk sugar content is limited, which are particularly the curdled milk-based products, ice cream, sweet milk, cream and fresh cheese. The normal cheddar, butter, milk with low lactose content/lactose-free milk and yoghurt contain very little amount of lactose and can be normally used [22].

Other fermented products like kephir/kefir, Biola drink and yoghurt contain lactose, however, due to the fact that the milk acid bacteria can break down lactose themselves, they are generally better tolerated than sweet milk. Separately, the lactase can be purchased in the form of liquid and tablets from a pharmacy. These products allow for getting nutrients with rich lactose content on special occasions, such as cream cake and ice cream. Since many dairy products can be used in the lactose intolerance, the calcium supplement is generally not essential [22].

Individuals who are allergic to eggs should exclude eggs (egg of any animal) and foods made with eggs, food with Albumin and Globulin, mayonnaise, macaroni, etc. from their diets [23].

It is of little importance to remove the egg in egg allergy in terms of the nutritional value. However, it may be difficult to bake good cakes and pies in a totally practical way. Increasing the amount of soda and baking powder and adding cornflour for the colour would usually be sufficient to solve this problem [22].

Fish allergy may be the severe form of food allergy. Whereas those with fish allergy react to any type of fish, some others may react to codfish while tolerating salmon, trout or mackerel [22]. Even some with fish allergy react to the steam that emerges while boiling fish [23]. Those with fish allergy usually tolerate the fish oil owing to the fact that it is purified in terms of

proteins. Fish oil is recommended for those with fish allergy because it contains long-chain omega-3 fatty acids, Vitamin D and herb. Seal oil and krill oil can be alternatives to very few of those who react to fish oil. Vitamin D should be taken in as a supplement. The use of dairy products preserves the need for iodine. Numerous ready-made products contain fish in terms of ingredients. As in all the other types of allergies, the descriptions and warnings of the products should be controlled and read with great care [22].

Individuals who are sensitive to fish and seafood may also show allergic reactions to the glues made of the skin of the fish and made of fishbone as well as to the fish and seafood. The glue is a strong allergen and is capable of causing sudden clinic symptoms [23].

Shrimps, crab, crawfish, lobster and other shellfish may lead to allergic and non-allergic reactions. In general, even the little amounts through foods or vapour/steam are enough to cause serious reactions. Since the basic allergen within shellfish are also found in mollusca, such as snail, calamaris (squid) and clams (mussels), the cross reactions among distinct species are common [22,23].

Legume Allergy: Peas, soy beans, lupin flour and peanut belong to the same plant family. Thus, cross reactions may occur among these species. For instance, lupin flour may cause an allergic reaction in some of those allergic to peanuts. Lupin flour is added into several well-cooked or medium-cooked pastry/pie products. Although peanut is found among the products triggering serious allergic reactions, it does not mean that all of those with peanut allergy will suffer from severe reactions. Reacting to the peanut is possible after the intake, or through hand contact or in powder/granulated form [22]. Most of those with peanut allergy may tolerate other tree nuts, it is important to take into consideration that these are usually seen together with food products [23]. Many people prove to be positive to soy in the allergy tests. The reason for this is that soy can cause a cross reaction along with the grass pollen and other legumes. Therefore, it should be guaranteed that soy yields clinical symptoms before excluding it from the nutrient/food [22].

In soy allergy, soy protein must be avoided. However, soy oil and soy lecithin can be used by many since they are based on oil fraction of soy beans. The products labelled as containing vegetable fat do not contain soy protein unless declared in particular [22].

Among the tree nuts are hazelnut, walnut, cashews, pistachio, almond and Brazilian chestnut. One may react to one or more types of nuts [22].

Sesame seed, sunflower seed and poppy seed are the examples of the seeds that may cause allergic reactions. Nut and seed allergy may lead to severe reactions. Hazelnut/nut is found in a number of food products and powder. The reaction is usually seen within a few minutes. For this reason, it is of great significance to read the product description very carefully [22].

Several products are labelled as "it may contain nut marks/traces". They can be consumed but must be very carefully consumed by those who underwent anaphylactic reactions before. The most sensitive ones should avoid nuts or fats/oils produced from seeds, since cold pressed fats may contain a considerable amount of protein residuals. However, those with nut allergy may tolerate oils. Many people show reactions against nuts and almonds only as a cross reaction

against the birch tree pollens. Such cross reactions generally indicate slight symptoms and these can usually be tolerated when the nut has been exposed to heat treatment [22].

In wheat allergy; wheat, rye and one or more proteins within barley may trigger allergic symptoms. The positive allergy tests are usually performed for wheat, regardless of any food allergy caused by the intake of wheat. Thus, it is important to verify whether or not there is a clinical allergy, or for instance, whether it is a positive test result due to a grass pollen allergy. When some inhale flour, they may have wheat allergy, but they may also tolerate well by eating foods in which wheat is used as a substance [22].

Corn has less allergen characteristics when compared with the wheat, and for this reason, it is preferred more than wheat. Wheat, on the other hand, is hard to exclude from diets because of its important place in almost any diet. In fact, this situation is also true for the corn. The alpha-amylase trypsin inhibitor is a glycoprotein existing in wheat and is an important allergen type. The food and food elements that should be avoided by the individuals who are allergic to wheat are; bran, crumbs, bulgur wheat, cereal extract, couscous, crackers, durum wheat and durum flour, gluten, macaroni, noodle, malt, soy sauce, starch [23].

Celiac disease, different from the IgE-mediated rapid allergy, involve an immunological reaction to wheat, rye and barley proteins. In the patients with Celiac disease, the gluten within the food/nutrient, the flattening of the intestines and an inflammation caused by the insufficient intake of nutrients will trigger a reaction. In both cases, the only treatment would be to completely eliminate wheat, barley, rye, spelt, rye wheat, corn wheat, soiled oat and all the products resistant to them [22].

In Celiac disease, the gluten-free diet must definitely be followed-up throughout lifetime. The elimination in wheat protein allergy is preserved singly as long as there is an allergy. When you eliminate the cereals containing gluten, the significant sources for fibres, Vitamin B and trace substances are lost, as well. That is why, today the gluten-free cereals in the supermarkets are recommended for use. The gluten-free oat, corn, buckwheat and seeds are particularly the nutritious alternatives [22].

Fruit and vegetable allergies are generally the cause of cross allergy. As the cross allergy proteins resemble each other, it means that the body does not experience any difference between the substances it is usually allergic to and the proteins within other foods/nutrients. In general, this ailment is perceived as itching and swelling in the mouth, nose, lips and throat. (oral allergy syndrome). This is an irritating situation, yet it is rarely dangerous. In the meantime, symptoms in the stomach, intestines and on the skin occur, as well. Those with birch tree allergy have sense of itching in their mouth when, for instance, a raw carrot or an apple is eaten. However, more often than not, they may still tolerate boiled, fried or canned fruit and vegetables well, whereas some may sense that they react to fruit/vegetables only during the pollen season [22].

In mite allergy, cross reactions may sometimes take place with shellfish and mollusca [22].

In latex allergy, one may experience cross reactions with kiwi, avocado and banana. In grass pollen allergy, the allergy tests generally yield positive results on wheat and legumes; however, this is rarely related with the allergic symptoms [22].

15. Fruit intolerance in the case of eczema

Some fruits may cause irritation on the skin in people with atopic eczema. These are usually histamine-releasing nutrients, such as citrus fruits, strawberries, tomatoes, pineapples and nuts. Separately, chocolate, pork meat, spices and benzoic acid may have such an impact [22].

16. Chocolate

This allergen is important because especially children consume it much, and for this reason it is responsible for the allergic nasal draining, migraine, efflorescence, pruritus, swelling and digestive system disorders. Certain symptoms may appear due to the consumption of chocolate or cacao from the same source [23].

17. Nutrition with the elimination of fruits & vegetables

If we eliminate a number of various fruits and vegetables from our diet, it may mean that the intake of Vitamin C, antioxidants and fibres may be low. Thus, it is important to find out other alternatives to falling in this group of foods to be tolerated. According to several experiences, the fruits like strawberry, raspberry, redcurrant, rosehip and cranberry are well-tolerated by both the children with eczema and those with pollen allergy. Papaya, mango, turnip, various types of cabbages and potatoes are the other examples to the reliable and good sources for Vitamin C and the antioxidants. In addition, there are also strawberry and fruit essence-based nutritional supplements and similar fruit juices [22].

18. Purchasing and Cooking

Read the product description carefully

In food allergy, it is important to read very carefully the list of ingredients / content list of the food products in order to make sure that there is no allergen in question. The manufacturer may sometimes change the food content without any package change, therefore, the description on the label must always be checked. According to the legal notice regulations, the following food allergens shall always be indicated with a mark on the list of ingredients, no matter how small amounts they might have. These are as follows: Gluten-based cereals, milk, shellfish, mollusca, fish, nuts, peanut, celery, mustard, sesame, soy, sesame seed, lupin and sulphur dioxide/sulphide [22].

19. Marking the "...traces..."

Furthermore, several products are marked as " it may contain nuts or " elements of similar traces..". Such a product, as a substance, is manufactured in a machine processing products of a company or also a company processing nuts, however, no nut is added, not even in small amounts [22].

Thus, there may be the risk of nut contamination. Yet, the products marked in this way are safe for many of those with allergies. Only in really serious/severe reactions must such a marking be taken into consideration [22].

20. E-substances

Additives/E-substances are added into the nutrient/food to extend the shelf life or create a texture or colour [22,23]. The additives can be isolated from synthetic manufactured foods or from other foods in a natural way. They are always reported via their own titles or an E-number. The additives never contain milk, lactose, gluten, hazelnut, fish or shellfish [22].

Lyzosyme (E1105) is the sole e-substance that may contain an egg protein. It is not normal to show an allergic reaction to additives. Some colouring agents and preservatives, particularly the benzoic acid components (E210-219) may irritate the current eczema if taken in greater amounts [22].

Individuals with allergy, especially with urticaria and atopic dermatitis, should consume fresh food without additives as much as possible [23].

21. The preparation of foods against food allergy

While cooking, what matters is to prevent any contact of the food being cooked with the nutrient to be avoided as well as making sure that the cutting-boards, ladles and forks, spoons and knives are cleaned well. The kitchen utensils are rinsed after used in cold water, and then they are washed as usual. Cold water helps prevent the proteins from sticking. If some have egg or fish allergy, it may be necessary for them to provide their own cooking pots and pans, while for those with only food allergy, it may be sufficient to provide utensils like ladle, etc. in the preparation of foods [22].

22. Conclusion and recommendations

As it is widely known, food allergy is a situation that affects the human life in an important level. The recent increase in allergic diseases should be considered in detail [5,23].

It is observed that people move away from the traditional food habits in developing and industrializing countries with the changing life styles, and this change is related with the allergy and allergic diseases [23].

Normal birth and feeding with breast milk are important steps foreseen by the nature itself in transferring the microorganisms (friendly bacteria) that manage the health to the babies on the early days of their lives. In the additional nutrients period, food that are rich in friendly bacteria that are presented to us by the nature, and the food that contains fibers that are the food for the friendly bacteria will ensure the continuance of a good health system [18].

People, who prefer the menus that are rich in prebiotic bacteria and their food prebiotics, and who eat natural food in its usual season will live healthier [18].

Author details

Şenay Çetinkaya*

Address all correspondence to: scetinkaya@cu.edu.tr

Pediatric Nursing, Adana School of Health, Çukurova University, Turkey

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