Chemical Additives from the Composition of Plastic Products and Other Materials in Establishing Diagnosis for Alergy Disease

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Many of the chemical additives in the plastic products, besides the possible safety problems that may arise during the production process, have negative effecty, too, on the environment and human health. Plastic is a synthetic polymer. The polymers include starch, latex and cellulose, combined with different substances and chemicals, used in various formulas, the polymer is included in the naylon. At high temperatures such as microwave oven temperature, polymers can migrate from the packaging plastic in food. In most cases, establishing the diagnosis of allergic disease is a complex and difficult operation. This difficulty is primarily related to the polymorphism of the clinical manifestations accompanying allergic reactions, the existence during the evolution of these conditions, of long clinical asymptomatic latencies, as well as due to numerous subjective and objective symptoms that overlap with those caused by the allergen, complicating and altering the clinical picture. Allergies are an abnormal reaction of the body to allergens and develop in two stages. After the first contact with the allergen, the IgE antibodies are produced, and the second contact produces the allergic reaction. The produced antibodies will release the chemical mediators (histamine, prostaglandine, etc.) which cause an inflammatory response, vascular changes and irritation of the tissues, with the appearance of symptoms specific to allergy: redness, rash, itching, edema, etc.The so complex symptom of allergic diseases comprises several systems and organs at the same time, and the existence of over-additive phenomena makes it impossible to have characteristic clinical symptoms of allergic diseases that allow their identification only by clinical examination. However, this does not mean that the clinical exam and the analysis of the various objective and subjective symptoms presented by the patient is of no importance in establishing the diagnosis and recognizing the allergic character of the disease.The study includes a number of patients studied at the Galati Allergy Clinic. Specific immunotherapy known as desensitization or anti-allergic vaccination, is designed to fight the causes of allergies that occur when the immune system misinterprets harmless substances. Clinical examination results are complemented by allergen and specific antibody research; skin tests are the most common method for allergen detection.

Keywords: allergies, allergens, antibodies, specific tests.

Among the factors that control migration include the chemical structure of the substances that are released and the nature of the packaged food. According to the studies, LDPE, HDPE and polypropylene bottles released measurable levels of BHT, chimassorb 81, irganox PS800, Irganix 1076 and Irganox 1010 in the vegetable oil and ethanol content. There was evidence that acetaldehyde can migrate from PET including into water.When a plastic pack is inserted into the microwave and heated, a plasticizer component can be transferred from plastic to food. The suspected form is diethylhexyl adipate - a carcinogen[1-3].

At high temperatures, such as the temperature in microwave ovens, polymers can migrate from plastic to food. The diagnosis of the certainty of allergic diseases is based on allergen detection. As in many cases allergen detection and removal is not accompanied by the disappearance of clinical phenomena, it is necessary to know and appreciate fairly all overdose symptoms that alter the clinical picture[4-6].

Diagnosis of allergic diseases is a complex operation, involving two important stages: the general clinical examination of the patient, allergen detection. These two phases of the patient's examination are approximately equal, the clinical data obtained by the general examination are confirmed by the allergen research methods and, conversely, the data obtained through the research of the patient is confirmed or denied by the results obtained at the clinical examination.

The clinical examination of allergic patients does not differ much from the clinical examination in general medicine; it includes the same phases: anamnesis, objective examination, laboratory examination. The only difference that exists in allergic patients is that these exams are done with more detail, it could even be said with some pedanteria[7-9].

The history of allergic patients is an important part of the clinical examination. From the data gathered through a detailed anamnesis, many elements of the diagnosis can be deduced or reconstituted.

During the interrogation, as much data as possible will be collected on the patient's family and personal pathology, disease progression, aggravating environmental, seasonal or occupational factors that influence disease progression, treatments followed and their effectiveness.

The interview should be supplemented with data on the patient's life, work schedule, nutrition, rest, some habits, etc. Sometimes, in these cases, iterations of the interaction

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are not sufficiently conclusive: the patient's re-examination or the investigation at the workplace or at the patient's home[10-12].

The patient's personal data are important for diagnosis: the age of the patient may give some indications of the allergic nature of a disease. The existence of asthma in an individual over 60 years of age implies an infectious origin, a cardiac condition and less an allergic etiology.

The patients'sex is of no particular importance. Allergic disease occur in equal proportions both sexes.

There are, however, differences in allergens, with women becoming more aware of cosmetics and household sensitization[13-16].

The patient's proficiency is important, with many cases of professional awareness being known, especially for chemicals such as potassium dichromate, etc.

The patient's home can give clues about environmental allergens: furs, pollen, dust, plant products, mold, plastics, etc. These data are of great importance if the crises are related to the patient's home, the hours he spends at home. The same notices are valid for changing the residence or for periods of time at the workplace[17-19].

The patient's information will be supplemented with data on the patient's lifestyle. Certain habits will be investigated: regular food consumption, medication, photo-amateurism, painting, etc.

Data obtained in this respect should be reported to data about his allergy.

The family and personal data could give important data regarding his present disease.The patient will be questioned primarily whether his parents, children or brothers have suffered or suffer from allergic conditions: bronchial asthma, allergic rhinitis , eczema, urticaria, migraine, etc.

It will also be investigated whether tuberculosis, metabolic and endocrine diseases (obesity, gout, diabetes), collagenosis, hematopoietic diseases occur in the family's antecedents. It is also important to specify whether any of family members suffered or suffer from a disease similar to that of the patient[20-22].

Personal family history data will be investigated concerning allergic diseases, contagious diseases, epidemic hepatitis, measles, tuberculosis infection, outbreaks of infection, digestive disorders, endocrine disorders[23-25].

There is need of a lot of patience during this research to show that by simply questioning the patient about his past, pathologically, he sums up the presentation of insignificant details, the physician is also obliged to inquire about some pathological symptoms that may be related to allergic disease, for example: abdominal painful crises, diarrhea, cough and periodic sneezing, headaches, etc.

The patient's detailed insight should not be exaggerated, for the doctor's too insistent questions, the patient sometimes giving affirmative answers[26,27,28].

The disease history is the most important part of the anamnesis. In many cases, with the history of the disease can be specified the elements necessary to establish a diagnosis of allergic disease, eventually also on the establishment of the allergen.

First of all it is necessary to establish the conditions in which the onset of the disease is established. Thus, it will be determined whether the onset of the disease was preceeded by the ingestion of some foods, medication if the onset of the disease is related to a certain season of the year, or whether it is conditioned by the environmental, professional or climatic factors[29,30].

After determining the conditions in which the disease began, its evolution will be analyzed, the circumstances in which the new causes arise, the factors that aggravate its evolution or contribute to rhythm In the case of a nettle rash patient, the daily appearance of eruptive attacks may be related to the ingestion of a drug or a laxative. The emergence of urticaria after meals causes us to suspect a food allergy. The asthma and allergic rhinitis that occur at night assume sensitization to inhaled antigens (dust, feathers).

Crises occurring on the same day of the week during weekend excursions involve the intervention of some climatic factors. The crises that occur only at home imply sensitization to inhaled antigens from the environment (dust, feathers, mold, contained in furniture, carpets, furs, etc.).

Crises occurring only in certain localities involve sensitization to inhaled antigens from the environment, especially pollen.

The pollen may be the cause of asthma attacks and allergic rhinitis that triggers in the spring and summer season and disappear in the cold season.

Asthma charts that occur exclusively in the cold season, if they are preceded or accompanied by respiratory infections, involve allergen sensitization.

The examination of the patient should be completed with a general clinical examination. This examination will cover the whole body, regardless of the type of allergic manifestation the patient presents. The general clinical specimen is supplemented with the usual laboratory samples. Regardless of the clinical form of the allergic disease samples will be taken for the haemogram, VSH. It will dose the calcium and blood potassium, blood glucose, urea and uric acid. Blood proteins and the albumin-globulin ratio will also be dosed.

In cases of chronic urticaria and especially in urticaria caused by physical agents, the alkaline reserve is also indicated.

Skin tests are the most widespread allergen detection.The alarming rise of allergic diseases in recent decades is due to several factors, including the plastics.

Experimental part

Materials and methods

The individual's sensitivity to certain substances is the basis of allergic diseases that are undergoing crisis and which are basically disturbed reactions of the nervous system to the penetration of various allergens in the body.

Our study includes a total of 140 cases studied during the period 2013-2017 at the Clinic of Allergology of Galati Clinic Hospital.

Results and discussions

Allergic diseases are characteristic of skin damage in the form of edema, vesicles or eczema, irritation of the conjunctiva and nasal mucosa, vascular spasm and smooth muscle, present in 39 cases - 27.85%. The bronchial asthma is part of the allergic diseases. It is characterized by dyspnea crises that occur due to muscular spasm smooth and swollen mucosa of small bronchi. Allergens that cause the asthma crisis penetrate through the airways. They can be of different origin, for example, flower pollen, hair, fur and epidermis of different animals.

Bronchial asthma crises may be reflex-conditioned. In a patient sensitized to flower pollen, the bronchial asthma crisis may sometimes appear at the simple sight of the flowers. 43 cases (30.71%) with asthma have been studied.

In the group of allergic diseasesalso belongs *spasmodic rhinitis*, which predominantly is a suffering from spring or early summer for individuals with a changed sensitivity to

different flowers. This disease is generally characterized by an inflammation of the nose mucosa and conjunctivitis-rhinitis and conjunctivitis, which usually occurs during the period of plant epherocity.

Allergic rhinitis is a risk factor for the development of asthma; predisposes to the development of asthma and affects the quality of life, besides nasal obstruction many patients with allergic rhinitis associate anxiety, irritability, sleep disturbances, tiredness, symptoms affecting the quality of life with respiratory allergy. These people may develop local or systemic allergic reactions including reactions severe cases such as anaphylactic shock after consumption of foods that cross react with the sensitizing allergen.

The main complications of allergic rhinitis are bronchial asthma, local complications with otitis and sinusitis. The number of rhinitis studied cases was 58 (41.42%).

Allergy therapy will include both specific methods and non-specific methods. The specific methods are only two: stopping the allergen entry (allergenic deficiency) and specific desensitization. All other methods are unspecific, either addressing the initial or secondary phase. Exposing the proven allergen has appropriate measures to its nature and access routes. An exclusion in the true meaning of the word is only feasible for the area-specific allergen.

The specific desensitization treatment is based on the presence of blocking antibodies that appear in the serum of allergic patients following the injection of small and repeated doses of the antigen. In cases where the contact with the allergen can be avoided, such as in drug allergy, specific desensitization is not indicated.

The allergic area comprises all the morpho-functional elements that favour, maintain and sometimes trigger the allergic reaction.

The predisposition (diathesis) to allergic diseases is also genotypic and phenotypic. We do not know how this body's action is mediated, humoral, hormone or nervous. Pathogenic uncertainties can not, however, reduce the importance of the notion of all allergologists and immunologists recognize the area factor as a leading role in the conduct of the allergic reaction. We also do not know how this organism's action is mediated, humoral, hormonal, or nervous.

Allergy symptoms in young children

The allergic child is affected by intolerancies, contact dermatitis or various sensitivities and may present the following manifestations: congestion of the nose, sinuses and throat; cough, sneezing, wheezing; digestive disturbances (bloating, nausea, vomiting, vomiting during meals), tear (bags around the eyes, cheeks, horizontal folding around eyes, under the eyes), excessive salivation and sweating, facial edema (swollen face) and extremities (hands and feet) eczema, insomnia (children can not rest) emotional disturbances, itching in the mouth (palatal pruritus) and in the ear (eye pruritus), anorexia, hyposmia or anosmia.

Food allergies rapidly manifests after the ingestion of allergenic food and manifests itself through. pruritus oropharyngeal rash, pruritic rash (swelling of the skin), swelling of the lips, face, tongue, nausea, vomiting, diarrhea.

Sometimes there may be body reactions to the allergen associated with lowering of blood pressure, swelling, anaphylactic shock.Contact dermatitis is exacerbated by excess moisture, excessive skin friction on the daily bath but also soaps used to remove the physiological acidic film of the skin, occurs following two mechanisms: orthoergic and allergic.

The orthoergic form is produced by chemical irritants (strong acids and alkalis, resins, insect venoms), and allergic contact dermatitis occurs only in those babies who have been sensitized to certain susbstances.It usually has an acute symptomatology, being limited to the point of contact, manifested by a vesicular or even bullous rash.

The lesions can be accompanied by prurit (itching), burning or burning sensations. This form of dermatitis has a favourable progression, and the lesions can even spontaneously break after the contact with the substance has been suppressed. After healing, the skin remains sensitive for a longer period of time, and may recur with subsequent contact, even at low concentrations of chemicals that do not usually cause dermatitis.

It is characterized by an initial erythematous eruption, which gradually becomes vesicular and subsequently dull and very pruritic (itching), initially located in the region of contact with the sensitizing substance. Later on, it extends to neighbouring areas. This form of dermatitis rarely occurs in young children, usually appearing in older ones and especially in predisposed children, following repeated contact with allergens (detergents, plastics, disinfectants, rarely plants, skin, metals).

In infants, particular forms of contact dermatitis are noted. Peri-oral dermatitis, which may extend to the chin, cheeks arising from contact with suckling milk, food regurgitation or leaked saliva. A special form of contact dermatitis is that of the diaper. It is an irritative dermatitis of urinary or facial origin and occurs between the third and the twelfth week of life. From a clinical point of view, it begins with a diffuse erythema, at the level of the perineal and genital region, which can extend to the inguinal region, the thigh root and the abdomen. Unhealthy, they become erosive and drooling, and the smell of ammonia directs the doctor to the diagnosis of diaper dermatitis. Complications occur when this dermatitis is not properly diagnosed and treated and occurs in the form of colonization of candida or microbial germs. Untreated condition is prolonged until the diapers are suppressed. To avoid the occurrence of contact dermatitis, appropriate hygiene measures will be maintained and the causal factors will be removed (the diapers).To avoid the contact dermatitis, appropriate hygiene measures will be kept and the favourizing factors will be put away. Synthetic clothing, soap-washing that is not recommended for children, rinse diapers thoroughly after washing, remove traces of detergents, and correct the diet and any digestive disorders may be avoided.

A big problem of our life today is plastic. The use of plastic in the food industry should be banned because it behaves like a toxic material that affects our health.

We dress in plastic, sleep in plastic and plastic we wipe on the skin after bathing! Our petroleum + chemical molecules pass through our body.

Conclusions

The body is constantly subject to the action of various factors in the environment; the pathological changes of the body's reactivity to these factors may vary within certain limits, considered physiological.

Allergy can be defined as an immunopathological phenomenon, characterized by a reactivity particular, specific, exaggerated, acquired by sensitizing the body to a heterogeneous substance that causes the formation of specific antibodies. Allergies may also be caused by viral and bacterial respiratory infections, environmental pollution, some medicines or vaccines.

References

1.BAENA-CAGNANI CE.J Allergy Clin Imunol 2010 Sept.;126(3):466-76.
2.CALDERON MA., LINNEBERG A, KLEINE-TEBBE J, et al , J Allergy Clin Immunol, 2015;136(1):38-48.
3.BROZEK JL1,BOUSQUET J. (ARIA) guidelines:2010 revision.
4.PATRICK G., HOLT, The Journal of Allergy and Clinical Immunology, July 2015.
5.KATHERINE LVANDEMHEEN, SHAWN D AARON,et all; JAMA 2017.
6.JACOBSEN L, NIGGEMANN B.DREBORG S, et al:.Allergy.2007 ;62 (8):943-948.
7.MOSBECH H CANONICA GW, BACKER V et al..Ann Allergy Asthma Immunol. 2015.
8.GRADINARU, I. , IGNAT ,L., DASCALU, C.G., SOROAGA, L.V., ANTOHE, M.E., Rev. Chim. (Bucharest),**69**, no. 2,2018, p.328-331
9.SOLOMON,S,URSARESCU, I., MARTU,A., et.al., Rev. Chim. (Bucharest), **66**, no. 8, 2015,p.1166-1168
10.SARBU,LG., LUNGU, N.C, FORNA, N.C.,et.al., Rev. Chim. (Bucharest) **64**, no. 12, 2013, p.1404-1407
11.COSTAN,A., DIMA, A.,IONITA, I et al, Optoelectrinics and advanced materials-rapid communications, 5(1-2),2011, p.92-95
12.ZEGAN G., DASCALU CG, MAVRU R.B., Medical Surgical Journal, 119(4),2015, pg.1153-1160
13.ANTOHE,M.E., DASCALU, C., SAVIN,C., FORNA, N.C., BALAN, A., Mat. Plast., **53**, no. 4, 2016, p. 767-770
14.TANCULESCU, O., DOLOCA, A., VIERIU,R.M et al., Chim., (Bucharest), **67**, no. 1, 2016,p.96-102
15.MATEI, M.N., EARAR, K., TRINCA, L.C., Rev. Chim. (Bucharest), **67**, no. 4,2016, p.800-807
16.MARECI, D., EARAR, K., ZETU, I., et al., Mat. Plast., **52**, no. 2,2015, p.150-153
17.ZEGAN, G, ANISTOROAIE, D., GOLOVCENCU, L., et al., Rev. CHim. (Bucharest), **68**, no. 9,2017, p.2052-2054
18.ANTOHE, M.E., FORNA AGOP, D., DASCALU, C.G., Rev. Chim. (Bucharest), **69**, no. 2,2018 p.521-524
19.POPESCU E, AGOP FORNA D, EARAR, K, FORNA NC, Mat. Plast., **54**, no.2, 2017, p. 390-392
20.CHECHERITA, L., BELDIMAN, M.A., STAMATIN ,O., et al. Rev. Chim. (Bucharest), **64**, no. 8, 2013,p.864-867
21.ZEGAN, G., CARAUSU, E., M, GOLOVCENCU, L., et al.Rev. Chim. (Bucharest),**68**, no. 2,2017, p.2929-2931
22.JUMANCA, D., GALUSCAN,A., PODARIU, A.C., et al.,Rev. Chim. (Bucharest), **65**, no. 12,2014, p. 1473-1476
23. .ASAFTEI,I.V., Sandu,I.G., Birsa,L.M., et al.,Rev. Chim. (Bucharest), **66**, no. 3, 2015
24.LUNGU,M.,ROMILA, A., NECHITA,A., et.al., ACTA MEDICA MEDITERRANEA; 33(3), 2017, pg.369-376
25.GRIGORIU,R.,CALIN,A.M.,ARBUNE,M.,et.al., Rev. Chim. (Bucharest), **67**, no. 2, 2016, p.366-371
26. CALIN, A.D.,PROCEEDINGS OF 2016 18TH INTERNATIONAL SYMPOSIUM ON SYMBOLIC AND NUMERIC ALGORITHMS FOR SCIENTIFIC COMPUTING(SYNASC), 2016, PG.264-261
27.SALARU,D.L., MERTENS,P.R., BARTSCH, P, INTERNATIONAL UROLOGY AND NEPHROLOGY,45(5), 2013, PG.248-250
28 .SALARU,D.L., MACOVEI, L., STATESCU, C., et al., REVISTA ROMANA DE MEDICINA DE LABORATOR, 21(4),2013, PG.407-414
29.COSTEA,C.F., TURLIUC,M.D., DIMITRIU, G., et al., Romanian Journal of Morphology and embryology,58(3), 2017, pg.739-747
30.SCUTARIU,M.M., SALAMASTRAKIS,I., STAN,C.I., et al, Romanian Journal of morphology and embryology, 57(3), 2016, pg. 1057-1061

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