Allergic pathology is one of the pressing issues in contemporary medicine. The urgency of the problem is primarily due to the prevalence of allergic diseases — in particular, according to the data provided by the European Association of allergologists and clinical immunologists, 150 million Europeans suffer from allergy, and in the following decade this number will increase up to 300 million. In the Western countries the prevalence of allergic rhinitis reaches up to 30 %, of bronchial asthma — up to 20 %, of allergic dermatitis — up to 15 % and of food allergies — up to 8 % [2]. Allergic diseases significantly reduce the patient’s quality of life and are often the cause of disability [3, 4]. These diseases are a heavy economic burden to both families and the society. It is estimated that only direct expenses for the treatment of asthma in Europe make up €3.6 billion on medicine and €4.3 billion on medical care [5].

The most important task during the treatment of allergic diseases is the determination of cause-significant allergens. The foregoing is necessary in case of food allergy for prescribing elimination diets as well as in the event of respiratory forms of allergies for conducting both elimination measures and allergen-specific immunotherapy.

Food allergy is the first temporal development form of sensitization and has significant influence on the formation and subsequent development of all allergic diseases of children. Different countries have their own regional food allergens, which depend on the climate and geographical location of the country and characteristics of the population’s diet. Pursuant to the data provided by the World Organization of Allergists, different countries have different patterns of food sensitization: that is, in the USA and Switzerland, apart from egg and milk allergy, peanut allergy is also a common one, while in Germany and Japan the most prominent allergen is wheat, in Spain it is fish, and in Israel-sesame [6].

Allergens that play a part in the development of respiratory allergic diseases (bronchial asthma, allergic rhinitis) also have substantial regional distinctions due to the diversity of climate, flora, periods of plant pollination, properties of pollen (in particular, the change of its allergenic qualities depending on the ecological state of the environment). Significant differences in the spectrum of...
pollen sensitization, the time of the onset and the duration of clinical symptoms of pollinosis may also be observed even within the territory of one country.

Nowadays the identification of specific IgE by means of ELISA is widely practiced in Ukraine for the diagnostics of food and respiratory allergies. Most laboratories offer identification of specific IgE in the form of panels, the composition of which does not entirely correspond with our regional peculiarities. For instance, a pediatric panel includes: milk, chicken egg protein, home dust, a mixture of alder and birch pollen, oak pollen, wormwood pollen, mites, dog and cat epidermis, crabs, shrimp mixture, fungus, ambrosia, timothy, soya beans and rye. Nevertheless, it is known that food allergy prevails at an early age (children under 3 years old), and therefore the determination of sensitization to pollen does not make sense. On the other hand, it is also not necessary to determine sensitization to shrimps, cancroids, mushrooms and soya, because these products are not included in the diet of young children. Some food panels include products (peanuts, sesame, coo ca, shellfish, spinach, and others), the determination of sensitization to which is also irrelevant due to the fact that they are not typical for our population’s diet.

A broad spectrum for pollen allergens is marked depending on the geographical zones — in particular, the main reason for polinosis in the central regions of the European part of Russia is the pollen of meadow grasses and trees (birch, alder, walnut, maple, oak); in Belarus it is the pollen of wild and cultivated cereals; in Kazakhstan — wormwood pollen, hemp and cereals, in Italy it is cereals, nettles and olive; in India — eucalyptus and acacia [1, 7, 8]. The composition of the panels of pollen allergens should also be reviewed with regard to the data of regional airplane research.

Research objective

Determining the relevant food and pollen allergens in the Kharkiv region for the optimization of laboratory diagnosis of allergic diseases among children.

Materials and methods

A retrospective analysis of 790 medical histories of children aged 3—17 years with allergic diseases has been conducted; the children were examined during 2010—2013 in the Regional children’s allergy centre of Hospital № 1. The identification of food and pollen sensitization was carried out by means skin prick-testing and the identification of specific IgE in the serum through ELISA. The results were processed by methods of variation statistics using «Microsoft Excel» and «BIOSTAT» (2006) on a Pentium IV PC.

Results and their discussion

54 (51.4 %) of the patients had their causative food allergens determined by skin prick-tests, and 51 (48.6 %) of the patients had their specific IgE determined. The total number of identified allergens was 47. We have combined all the allergens in groups according to the generality of the antigenic structure: cow protein (milk, beef), chicken protein (albumen, yolk, meat), fish (carp, hake, pollack), gluten cereals (wheat, rye, oats, barley), gluten-free cereals (rice, buckwheat, millet, maize), Rosaceae (strawberry, wild strawberry, apricot, peach, raspberry, cherry, sweet cherry, plum, apple, pear), citrus fruits (orange, lemon, mandarin), Solanaceous (tomato, potato), carrot, legumes (beans, peas, cocoa), pork, Cucurbitaceae (watermelon, pumpkin, melon, cucumber), as well as cabbage, beetroot, onions, banana, currants, black tea, grapes (Fig. 1).
As seen in Fig. 1, it was fish, legumes, berries and fruits of the Rosaceae family, citrus fruits, Solanaceous, chicken protein, cow’s milk protein and cereals that most frequently caused sensitization among examined children; vegetables and fruits (banana, pumpkin, onion, beetroots, cabbage, currants) caused sensitization a little bit less frequently. The received data differs from the one presented in medical literature, according to which sensitization to peanuts, seafood, eggs is the most common one.

685 children were subjected to allergy testing with pollen allergens. Consequently, it was found that 311 children (45.04 %) had high sensitization to pollen allergens. The obtained results are presented in table 1, with plants ranked in descending order of their allergic properties. Most of the children (276 patients, which constitutes 88.7 %) demonstrated polyvalent sensitization.

The analysis of pollen sensitization helped identify the most representative allergenic taxa for the Kharkiv region.

Table 1. Characteristic of pollen sensitization among children of the Kharkiv region

| №  | Name of allergens                  | Number of detections | Presence of sensitization |
|----|-----------------------------------|----------------------|---------------------------|
| 1  | Ambrosia artemisiifolia           | 305                  | 168                       | 55.08 |
| 2  | Dandelion                         | 306                  | 140                       | 45.75 |
| 3  | Artemisia absinthium              | 306                  | 122                       | 39.87 |
| 4  | Populous                          | 397                  | 118                       | 39.73 |
| 5  | Cyclachaena xantifolia            | 228                  | 90                        | 39.47 |
| 6  | Helianthus annuus                 | 305                  | 120                       | 39.34 |
| 7  | Buckwheat satio                   | 215                  | 81                        | 37.67 |
| 8  | Lignorum sethima ante             | 215                  | 80                        | 37.21 |
| 9  | Rumex                             | 215                  | 78                        | 36.28 |
| 10 | Festuca pratensis                 | 306                  | 111                       | 36.27 |
| 11 | Poa pratensis                     | 301                  | 100                       | 33.22 |
| 12 | Acer                              | 248                  | 82                        | 33.06 |
| 13 | Alnus aglutinosa                  | 305                  | 99                        | 32.46 |
| 14 | Lolium perenne                    | 229                  | 73                        | 31.88 |
| 15 | Plantago                          | 291                  | 92                        | 31.62 |
| 16 | Avis-cerasis lignum               | 215                  | 67                        | 31.16 |
| 17 | Quercus                           | 244                  | 74                        | 30.33 |
| 18 | Salix                             | 215                  | 65                        | 30.23 |
| 19 | Tilia                             | 292                  | 85                        | 29.11 |
| 20 | Dactylis glomerata                | 285                  | 79                        | 27.72 |
| 21 | Betula                            | 306                  | 84                        | 27.45 |
| 22 | Seniorem                          | 291                  | 79                        | 27.15 |
| 23 | Triticum                          | 285                  | 77                        | 27.02 |
| 24 | Chenopodiaceae                    | 306                  | 80                        | 26.14 |
| 25 | Juglans                           | 292                  | 73                        | 25.68 |
| 26 | Cinis                             | 215                  | 52                        | 24.19 |
| 27 | Alopecurus pratensis              | 301                  | 72                        | 23.92 |
| 28 | Urtica dioica                     | 288                  | 65                        | 22.57 |
| 29 | Festuca pratensis                 | 306                  | 69                        | 22.55 |
| 30 | Aesculus hippocastanu             | 292                  | 65                        | 22.26 |
| 31 | Corylus aveliana                  | 304                  | 67                        | 22.04 |
| 32 | Item carpinus                     | 215                  | 42                        | 19.53 |
| 33 | Zea mays                          | 306                  | 58                        | 18.95 |
| 34 | Pinus silvestris                  | 241                  | 41                        | 17.01 |
| 35 | Picea                             | 214                  | 36                        | 16.82 |
| 36 | Phleum pratense                   | 259                  | 40                        | 15.44 |
| 37 | Agropyrum repens                  | 241                  | 26                        | 10.79 |
region — weeds (ambrosia, artemisia absinthium, cyn~
cyclachen xantifolia). Among trees the populus, ligno~
rum setthim ante, acer, alnus aglutinosa and quercus were ranked first by allergenic properties. Betula pollen is a common cause of allergic rhinitis in many areas. In the Kharkiv region, it ranks 21st and is the cause of sensitization among 28% of patients with allergic diseases. In addition, an unusually high sensitization to pollen, dandelion (46%) and rumex (36%) is observed.

Conclusions
1. The identified relevant regional food allergens include: fish, legumes, berries and fruits of the Rosaceae family (strawberry, wild strawberry, apricot, peach, rasp~
berry, cherry, sweet cherry, plum, apple, pear), citrus, chicken protein, cow’s milk protein.
2. The regional differences in the spectrum of pollen sensitization were defined. In particular, the most representa~
tive allergenic taxa in the Kharkiv region are weeds (ambrosia, artemisia absinthium, cyclachen xantifolia), dandelion, buckwheat satio, rumex and trees such as popu~
lus, lignorum setthim ante, acer, alnus aglutinosa, quercus.
3. During the preparation of test panels manufacturers recommend to determine food and pollen allergens separately, because they have different signifi~
cance for children depending on the nosological form and the period of childhood.
4. During the preparation of test panels manufacturers or specialists should arrange the allergens with regard to the relevant regional factors which have specific cli~
tical and geographical distinctions.

Literature
1. Довідник з алергології // Науково-методичне видання / За ред. Пухлика Б.М. — К.: ТОВ «Доктор-Медіа», 2011. — С. 158-160.
2. EAACI: A European Declaration on Immunotherapy. Designing the future of allergenspecific immunotherapy Calderonetal // Clinical Pediatrics. — 2012. — 63(6). — 660-669.
3. Baiardini I., Braido F., Tarantini F., Porcu A., Bonini S., Bouqueret P.J. et al. ARIA-suggested drugs for allergic rhinitis: what impact on quality of life? A GALEN review // Allergy. — 2008. — 63(6). — 660-669.
4. Wertz D.A., Pollack M., Rodgers K., Bohn R.L., Sacco P., Sullivan S.D. Impact of asthma control on sleep, attendance at work, norma lactu~
cities, and disease burden // Ann. Allergy Asthma Immunol. — 2010. — 105(2). — 118-123.
5. European Respiratory Society (ERS): European Lung White Book. The First Comprehensive Survey on Respiratory Health in Eu~
rope, 2003.
6. World Allergy Organization (WAO) Special Committee on Food Allergy. World Allergy Organization (WAO) Diagnosis and Ra~
tionale for Action against Cow’s Milk Allergy (DRACTMA) Guidelines / Fiocchi A., Brozek J., Schienmann H., Bahna S.L., von Berg A., Beyer K., Bozolla M., Bradsher J., Compalati E., Ebisawa M., Guczyn M.A., Li H., Heine R.G., Keith P., Lack G., Landi M., Mar~
telli A., Runci F., Sampson H., Stein A., Terracciano L., Vieths S. // Pediatr. Allerg. Immunol. — 2010. — Vol. 21, Suppl. 21. — P. 1-125.
7. Airborne allergenic pollens in Padua: 1991-1996 / Giorato M., Lorenzoni F. et al. // Aerobiologia. — 2000. — Vol. 16. — P. 453-454.
8. Kohzar V. Aeropalo~
ynological monitoring in Bishkek, Kyrgyzstan // Aerobiologia. — 1999. — Vol. 15. — P. 149-153.

KLІНІЧНА ПАДІЄТРІЯ / Clinical Pediatrics

ОПТИМІЗАЦІЯ ЛАБОРАТОРНОЇ ДІАГНОСТИКИ АЛЛЕРГІЇ С УЧЕТОМ РЕГІОНАЛЬНИХ ОСОБЕННОСТЕЙ

Резюме. Алергічна патологія є однією із найбільш акту~
альних проблем сучасної медицини. При лікуванні алер~
гічних захворювань найбільш важливим є визначення
причинно-значущих алергенів. Для діагностики харчової та респіраторної алергії тепер в Україні широко викорис~
tовують визначення специфічних IgE у сироватці крові. Більшість лабораторій пропонують визначення специфіч~
них IgE у вигляді панелей, склад яких не зовсім відпові~
дає нашим регіональним особливостям. У статті наведені результати аналізу 790 історій хворих дітей 3–17 років з алергопатологією. Сенсибілізація до алергенів виявлялась у 10.10.15

КЛІНІЧНА ПАДІЄТРІЯ / Clinical Pediatrics

ОПТИМІЗАЦІЯ ЛАБОРАТОРНОЇ ДІАГНОСТИКИ АЛЕРГІЇ З УРАХУВАННЯМ РЕГІОНАЛЬНИХ ОСОБЛИВОСТЕЙ

Резюме. Алергічна патологія є однією із найбільш акту~
альних проблем сучасної медицини. При лікуванні алер~
гічних захворювань найбільш важливим є визначення
причинно-значущих алергенів. Для діагностики харчової та респіраторної алергії тепер в Україні широко викорис~
tовують визначення специфічних IgE у сироватці крові. Більшість лабораторій пропонують визначення специфіч~
них IgE у вигляді панелей, склад яких не зовсім відпові~
da нашим регіональним особливостям. У статті наведені результати аналізу 790 історій хворих дітей 3–17 років з алергопатологією. Сенсибілізація до алергенів виявлялась у 10.10.15

Ключові слова: діти, алергія, лабораторна діагно~
stика.