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Oral Allergy Syndrome – a still current problem

Zespół alergii jamy ustnej – problem wciąż aktualny

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ABSTRACT

Oral Allergy Syndrome (OAS) is a type of cross-allergy in people allergic to pollen, manifested by inflammation, itching, burning and redness of the oral mucosa and lips after eating raw vegetables containing the PR-10 allergen, including: apples, cherries, strawberries, tomatoes, peaches and many others. This is a particularly important issue for the dentist as he or she is often the first person to come into contact with a patient suffering from OAS. The role of the dentist in the management of OAS is to make an initial diagnosis and refer the patient to an allergist. The diagnosis of OAS is based on a medical interview, skin testing and IgE antibody testing. Treatment of OAS includes an elimination diet, the use of antihistamines or steroids for more severe forms of OAS, and immunotherapy. A patient with OAS requires interdisciplinary care from doctors of many specialties including periodontists, allergists and laryngologists.

Keywords: allergy, oral mucosa, interdisciplinary treatment.

STRESZCZENIE

Zespół alergii jamy ustnej (Oral Alerty Syndrome – OAS) to rodzaj alergii krzyżowej występującej u osób uczulonych na pyłki. Objawia się stanem zapalnym, swędzeniem, pieczeniem i zaczerwienieniem błony śluzowej jamy ustnej i warg obserwowanej najczęściej po spożyciu produktów zawierających alergen PR-10, takich jak jabłka, wiśnie, truskawki, pomidory, brzoskwinie i wiele innych. Jest to szczególnie ważna kwestia dla lekarza dentysty, ponieważ często jest on pierwszą osobą, która ma kontakt z pacjentem cierpiącym na OAS. Rolą dentysty w leczeniu OAS jest postawienie wstępnej diagnozy oraz skierowanie pacjenta do alergologa. Diagnoza OAS opiera się na wywiadzie lekarskim, testach skórnych i badaniu przeciwciał IgE. Leczenie OAS obejmuje dietę eliminacyjną, stosowanie leków przeciwhistaminowych lub sterydów w przypadku cięższych postaci OAS oraz immunoterapię. Pacjent z OAS wymaga interdyscyplinarnej opieki lekarzy wielu specjalności, w tym periodontologów, alergologów i laryngologów.

Słowa kluczowe: alergia, błona śluzowa jamy ustnej, leczenie interdyscyplinarne.

Introduction

Allergy is pathological response of immune system to the impact of various foreign substances named allergens that are not harmful in themselves. Therefore, during an allergic reaction, specific antibodies are produced, which, after binding to the antigen, lead to the release of various inflammatory mediators. Oral Allergy Syndrome (OAS) is a type of allergy that occurs in the oral cavity. It is a type of cross-allergy manifested by local symptoms in the oral cavity and, in more serve forms, a generalized anaphylactic reaction [1]. The clinical picture of oral allergy syndrome manifests itself locally on the oral mucosa and, in more severe cases, systemically. Symptoms in oral cavity include inflammation manifested by swelling, itching and redness

of the of the lips (especially lower lip), oral mucosa (floor of the mouth and tongue), throat and larynx, as well as hemorrhagic and patchy lesions on the mucous membrane [2, 3]. Other local symptoms outside the oral cavity include shortness of breath, skin urticaria, conjunctivitis, eye socket swelling and rhinitis. Symptoms from the digestive system include abdominal pain, nausea, vomiting and diarrhea. 9% of patients suffering from OAS develop life-threatening anaphylactic shock, which requires urgent medical intervention [4]. OAS manifests in patients allergic to birch pollen after eating a food of the family Rosaceae such as apple, peach, cherry, etc. [5–7]. 93% of patients allergic to birch pollen have specific IgE against the beta v 1 allergen. Cross-reactions with beta v1 manifest themselves in oral allergy syndrome after consumption of raw foods. Most often, OAS occurs after eating raw apples, which is caused by the main apple allergen Mal d1, but the multitude of Bet v1 homologues means that the number of potential cross-reactions is significant [8].

The dentist, especially periodontist, is usually the primary care physician for individuals suffering from OAS and might have a decisive role in diagnosis, emergency treatment and referral to an allergy specialist. This is why common understanding of the topic is so important by this professional group. OAS, like most allergies, is becoming more and more common in the population due to the development of civilization and increased awareness of personal hygiene [9]. Depending on the region and gender, up to 40% respondents of Polish origin declare allergy symptoms [10]. According to data from the World Allergy Organization (WAO) from 2013, the problem of food allergy affects 11–26 million people in Europe. Nearly 47–70% of food allergy cases are related to the co-occurrence of inhalant allergy [11].

Etiopathogenesis

OAS occurs in patients with pollinosis through cross-reaction – allergens of raw vegetables and fruits are identical to plant pollen allergens. The similarity of the structure of allergens, called panalegens, originating from different sources and unrelated biological groups is the essence of the phenomenon of cross-allergy. The cross-sensitivity occurs when IgE antibodies resulting from contact with one allergen recognize and bind a protein with a similar structure from another allergen source [12, 13]. Patients suffering from OAS should know the full list of vegetables and fruits that may cause OAS and follow a diet eliminating these products. Products that may cause OAS include: apple, sweet cherry, peach, corn, lettuce, orange, cabbage, hazelnut, walnut, asparagus, lemon, strawberry, tomato, apricot, plum, grape, pear, kiwi, nectarine, tomatoes, melon, watermelon, bananas, parsley, celery, potatoes, green peppers, dill, cumin, peas, cilantro, fennel, potatoes, zucchini, cucumbers, squash, almonds, lentils, beans, sunflower seeds [14]. All these plant products contain an allergen from the PR-10 family, which is responsible for causing an allergic reaction in the oral cavity. PR10 proteins found in plant tissues play a role in the aging process. These are intracellular, acidic proteins with a molecular weight of 15–18 kDa that bind to cytokines, plant DNA and steroids. They are broken down by the action of digestive enzymes and thermal denaturation – therefore it is recommended to rinse the mouth with warm water after contact with the allergen causing OAS [15].

Diagnosis

A thorough interview with the patient is the basis for the initial diagnosis of OAS. The patient should be asked about the occurrence of allergy symptoms (such as rhinitis and conjunctivitis, asthma, contact urticaria, food allergy) during the period of increased tree pollen fall (February-April) to initially confirm or exclude the presence of tree pollen allergy [4]. In the medical interview, we take into consideration whether OAS symptoms appear within a few minutes after consuming raw vegetables and fruits and ask for a full list of products followed by OAS symptoms and a family history of allergy. We may also encourage the patient to keep a diary in which they will record the occurrence of allergies in the oral cavity, the time of symptoms onset after contact with the allergen and the type of food causing the allergy [4].

The role of the dentist in the diagnosis of OAS is to make a preliminary identification and refer the patient to an allergist for further diagnostics. The basis of diagnosis is an interview and physical examination. If OAS is suspected, diagnostics for pollen allergy should be performed. A patient is diagnosed with pollen allergy if they manifest symptoms of pollen allergy, shows positive skin test results and has an increased concentration of allergen-specific IgE antibodies in the blood serum [15–17].

In order to initially detect the source of allergy, skin prick test (SPT) and serological testing of specific IgE (sIgE) are used. The gold standard in the diagnosis of OAS remains the double-blind, placebo-controlled food challenge (DBPCFC). A con-

traindication to this method is a history of severe food reactions, as this attempt may cause allergic reactions of unpredictable severity. The easiest and safest method of making a diagnosis is to look for specific IgE in blood serum using singleplex and multiplex systems [15]. Correct diagnosis is crucial for patients suffering from oral allergy syndrome. Identification of allergens to which a patient is allergic allows predicting allergenicity and cross-reactivity with homologous molecules found in other products.

Treatment

Treatment of OAS should be carried out interdisciplinary. The basis of OAS treatment is a diet eliminating products containing allergens from the PR-10 family, which is why thorough patient education is important. The patient should know the full list of products which they are allergic to and strictly eliminate them. The list of products should be prepared based on the history of oral allergy episodes and the results of allergy tests. It may also be very helpful to keep an allergy journal in which the patient records exactly the type of food that causes oral allergy [5].

The patient should also be trained in instructions for what to do when OAS occurs. In case of OAS symptoms appearance, the patient should immediately stop eating allergenic products and rinse mouth with hot but not boiling water for denaturation of the protein allergens. It is also recommended to write down information about the type of food eaten that caused OAS, which may be useful information for the allergist. If recommended by an allergist, the patient should take antihistamines after which the symptoms should disappear within 30 to 60 minutes. In rare cases, allergens that cause OAS can also cause severe, generalized symptoms, including anaphylaxis. Therefore, patients with a history of anaphylaxis should carry a portable epinephrine injection kit and have skills to administer it intramuscularly [5].

The selection of pharmacotherapy in the case of OAS is carried out by an allergist, while a dentist, who is often the first specialist to diagnose OAS, should know the course of treatment. It has been reported that OAS symptoms were significantly improved with antihistamines compared to placebo [5]. Antihistamines partially alleviate the symptoms of oral allergy syndrome and should be used to treat the disease. Antihistamines used in oral allergy syndrome treatment include astemizole, cetitizine and are administrated per os [6]. Topical application of cromolyn sodium (mast cell stabilizer) or levocetirizine (antihistamines) before food intake has proven effective in the treatment of some OAS patients. In more severe cases of OAS, steroids are also a curative treatment option [18].

Immunotherapy is a safe and effective method of treating allergies, which involves multidirectional modulation of the immune response, in particular T lymphocytes. Allergen immunotherapy is indicated in cases of the presence of specific antibodies against appropriate allergens – qualification for this type of treatment should take into account the correlation between exposure to allergens and symptoms of the disease and the type of hypersensitivity reaction (IgE-dependent reaction) [19, 20]. In case of OAS, desensitization to pollen is recommended, which minimizes the occurrence of cross-reactions. Immunotherapy is effective if allergy occurs to a single allergen. It was reported that after subcutaneous specific immunotherapy (SIT), food tolerance and negative skin tests persisted for 30 months. After 1 year on immunotherapy, the patient's allergic rhinitis symptoms resolved, and he was able to eat fresh fruits and vegetables without reaction. However, immunotherapy as a treatment for OAS requires further research [19].

Conclusion

Oral allergy syndrome not only significantly reduces the quality of life of patients by forcing them to constantly follow a restrictive diet and follow medical recommendations, but in rare cases it can also threaten the patient's life, which is why awareness of the symptoms and treatment of this disease among dentists is important. Patients suffering from OAS firstly refer to dentists. It is also very important to conduct further research on the treatment of OAS, in particular immunotherapy, which gives hope for improving the quality patients' life. However, no standardized treatment protocol for OAS patients has been developed, which significantly reduces the effectiveness of the therapy. Another challenge in the treatment of oral allergy syndrome is the need for cooperation between doctors of many specialties, such as dentists, allergists, dermatologists, laryngologists and pediatricians. Despite numerous defiance's in treatment, the proposed treatment methods are safe, well tolerated and bring satisfactory results, acting both symptomatically and immunomodulating.

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Conflict of interest statement

The authors declare no conflict of interest.

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References

[1] Saunders S, Platt MP. Oral allergy syndrome. Curr Opin Otolaryngol Head Neck Surg. 2015;23(3):230-4. doi: 10.1097/MOO.0000000000000160.
[2] Chmielewska A, Mazur M, Sacha. [i in.]. Zespół alergii jamy ustnej u pacjentów z alergią pyłkową. 2013. Przegląd Lekarski. 70(11):885-887.
[3] Mari A, Ballmer-Weber BK, Vieths S. The oral allergy syndrome: improved diagnostic and treatment methods. Curr Opin Allergy Clin Immunol. 2005;5(3):267-273. doi: 10.1097/01.all.0000168793.27948.b0.
[4] Panaszek B, Szmagierewski W. Podstawy patomechanizmu zjawiska alergii krzyżowej. 2010. Alergia 3, s. 39-46.
[5] Kondo Y, Urisu A. Oral allergy syndrome. Allergol Int. 2009;58(4):485-91. doi: 10.2332/allergolint.09-RAI-0136.
[6] Kashyap RR, Kashyap RS. Oral Allergy Syndrome: An Update for Stomatologists. J Allergy (Cairo). 2015;2015:543928. doi: 10.1155/2015/543928.
[7] Pastorello E, Ortolani C, Farioli L, Pravettoni V, Ispano M, Borga A, et al. Allergenic cross-reactivity among peach, apricot, plum, and cherry in patients with oral allergy syndrome: an in vivo and in vitro study. J Allergy Clin Immunol. 1994;94(4):699–707. doi: 10.1016/0091-6749(94)90177-5.
[8] Bartuzi Z. Nowe spojrzenie na alergeny pokarmowe. 2011. Alergia 2, s. 31-37.
[9] Platts-Mills TA. The allergy epidemics: 1870–2010. J Allergy Clin Immunol. 2015;136(1):3-13. doi: 10.1016/j.jaci.2015.03.048.
[10] Ivković-Jureković I. Oral allergy syndrome in children. Int Dent J. 2015;65(3):164-8. doi: 10.1111/idj.12164.
[11] Mrówka-Kata K, Fira R, Namysłowski G, Scierski W. Zespół Amlot-Lessofa – zespół alergii jamy ustnej. Forum Medycyny Rodzinnej. 2007;1(4):355-357.
[12] Sussman G, Sussman A, Sussman D. Oral allergy syndrome. CMAJ. 2010;182(11):1210-1. doi: 10.1503/cmaj.090314.
[13] Kitaura J, Murakami M. Positive and negative roles of lipids in mast cells and allergic responses. Curr Opin Immunol. 2021;72:186-95. doi: 10.1016/j.coi.2021.06.001.
[14] Alessandri C, Ferrara R, Bernardi ML, Zennaro D, Tuppo L, Giangrieco I, Ricciardi T, Tamburrini M, Ciardiello MA, Mari A. Molecular approach to a patient's tailored diagnosis of the oral allergy syndrome. Clin Transl Allergy. 2020;10:22. doi: 10.1186/s13601-020-00329-8.
[15] Bindslev-Jensen C, Vibits A, Stahl Skov P, Weeke B. Oral allergy syndrome: the effect of astemizole. Allergy. 1991;46(8):610-3. doi: 10.1111/j.1398-9995.1991.tb00631.x.
[16] Santos AF, Du Toit G, O'Rourke C, Becares N, Couto-Francisco N, Radulovic S, et al. Biomarkers of severity and threshold of allergic reactions during oral peanut challenges. J Allergy Clin Immunol. 2020;S0091–6749(20):30490–30495. doi: 10.1016/j.jaci.2020.03.035.
[17] Deng S, Yin J. Clinical utility of basophil activation test in diagnosis and predicting severity of mugwort pollen-related peach allergy. World Allergy Organ J. 2019;12(6):100043. doi: 10.1016/j.waojou.2019.100043.
[18] Jura-Szołtys E, Rogala B. Immunoterapia w alergiach sezonowych. Alergia Astma Immunologia. 2016;21(1):44-48.
[19] Kelso JM, Jones RT, Tellez R, Yunginger JW. Oral allergy syndrome successfully treated with pollen immunotherapy. 1995. Ann Allergy Asthma Immunol. 74(5):391-396.
[20] Webber CM, England RW. Oral allergy syndrome: a clinical, diagnostic, and therapeutic challenge. Ann Allergy Asthma Immunol. 2010;104(2):101-8; quiz 109-10, 117. doi: 10.1016/j.anai.2009.11.007.

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