Manifestations of drug allergy in children under one year of age

Jumartova Sharofat Sevindikovna

Bukhara Regional Children's Multidisciplinary Medical Center

Abstract: *Drug allergies in children under one year of age present unique challenges due to the limited ability of infants to communicate symptoms and the potential for severe, rapid-onset reactions. This article reviews the manifestations of drug allergies in this age group, including common symptoms, diagnostic approaches, and management strategies. It aims to provide a comprehensive overview for healthcare professionals to aid in early recognition and intervention.*

Keywords: *drug allergy, children, one year, immunoglobulin.*

Drug allergies in infants are a significant concern due to their potentially severe and unpredictable nature. Infants are particularly vulnerable to adverse drug reactions (ADRs) because of their immature immune systems and high sensitivity to environmental factors. This review explores the clinical manifestations of drug allergies in children under one year of age, emphasizing the importance of early identification and management.

Understanding Drug Allergies in Infants. Immunological Basis:

Drug allergies occur when the immune system erroneously identifies a drug as a harmful substance, leading to an exaggerated immune response. In infants, this response can be complicated by their developing immune system, which may respond differently compared to older children and adults.

Common Drugs Associated with Allergies:

Common drugs that may cause allergic reactions in infants include antibiotics (e.g., penicillins, cephalosporins), anticonvulsants, and vaccines. Identifying the culprit drug can be challenging due to the overlap of symptoms with other conditions.

Clinical Manifestations. Cutaneous Reactions:

Rashes: Urticaria (hives) and maculopapular rashes are the most common cutaneous manifestations of drug allergies. These rashes can appear shortly after drug administration and may be localized or generalized.

Erythema Multiforme: This rare but serious condition can present with target-like lesions and may be associated with systemic symptoms. It is crucial to differentiate this from other types of rashes.

Gastrointestinal Reactions: Diarrhea and Vomiting: These symptoms can occur in response to certain antibiotics or other medications. They may be indicative of an allergic reaction or an intolerance.

Respiratory Reactions: Wheezing and Difficulty Breathing: These symptoms can signal anaphylaxis or less severe allergic reactions. Infants may present with respiratory distress or increased respiratory rate.

Systemic Reactions: Anaphylaxis: A severe, potentially life-threatening reaction characterized by a sudden onset of symptoms such as difficulty breathing, hypotension, and swelling. Immediate medical attention is required.

Diagnostic Approaches. Clinical History: A detailed history of drug exposure, including onset and progression of symptoms, is crucial. Family history of drug allergies and any previous allergic reactions should be reviewed.

Skin Testing. Skin prick tests or intradermal tests can be used to assess sensitivity to specific drugs, although their utility in infants is limited and results should be interpreted cautiously.

Serological Tests. Serological assays, such as specific IgE testing, can help identify allergic responses, though their reliability in very young children can be variable.

Challenge Testing. Drug challenge testing may be performed under controlled conditions to confirm a drug allergy. This approach should only be conducted in specialized settings due to the risk of severe reactions.

Management and Prevention. Avoidance:

The primary strategy for managing drug allergies is to avoid the offending drug. Clear documentation of the allergy in medical records is essential to prevent future exposures.

Pharmacological Interventions. Antihistamines and corticosteroids may be used to manage mild to moderate allergic reactions. Epinephrine is the treatment of choice for anaphylaxis and should be administered promptly.

Education and Monitoring. Parents and caregivers should be educated about recognizing allergic reactions and the importance of avoiding the identified allergen. Regular follow-up with healthcare providers is essential to monitor for any new reactions.

Conclusion. Drug allergies in infants under one year of age require careful attention due to their potential severity and the difficulty in recognizing symptoms. Early identification and appropriate management are crucial to minimize adverse outcomes. Ongoing research and advancements in diagnostic and therapeutic

techniques will continue to improve our understanding and handling of drug allergies in this vulnerable population.

From the perspective of modern clinical immunology, drug allergy (DA) refers to clinically defined allergic reactions induced by specific medications, with immunological mechanisms forming the pathogenic basis of these reactions. Drug hypersensitivity reactions occur in 5-10% of the population. The clinical manifestations of DA are highly polymorphic.

Currently, there is no universally accepted classification of DA. Previously, it was proposed to categorize different clinical forms of DA based on the predominant type of immunopathological reaction involved in the clinical picture caused by drug-induced damage. Accordingly, the following drug allergic manifestations were distinguished:

IgE-mediated DA;

Cytotoxic reactions, resulting from the interaction of a drug molecule as a hapten with cell membranes, leading to the formation of antibodies to this complex;

Immune complex reactions, where the formation of immune complexes activates the complement system, causing damage to cell membranes;

Autoimmune reactions, which are associated with the formation of autoantibodies to organs and tissues of the human body modified by the drug;

Drug allergic reactions based on cell-mediated immunopathological reactions.

Y.P Borodin proposed a clinicopathogenetic classification of DA. According to this classification, two types of drug-induced allergic diseases (AD) are distinguished. The first group includes humoral type AD, which encompasses systemic allergic reactions and diseases such as anaphylactic shock, acute urticaria, Quincke's edema,

serum sickness and serum-like reactions, allergic bronchitis, bronchial asthma, allergic rhinitis, agranulocytosis, and thrombocytopenic purpura. In this group, drug allergy may also exacerbate the underlying allergic diseases such as bronchial asthma, allergic bronchitis, chronic urticaria, and atopic dermatitis. Local reactions like the Arthus-Sakharov phenomenon are also included in the humoral type AD group.

The second group of AD, induced by drug sensitization, includes cell-mediated type AD. This group comprises local allergic manifestations in the form of contact-type complications (contact dermatitis, dermatitis conjunctivitis, keratitis, etc.) and systemic reactions such as:

Fungal-like reactions (erythema vesicular dermatitis);

Lupus-like syndrome;

Hyperergic type complications (erythroderma, bullous and hemorrhagic dermatitis, Lyell syndrome, Stevens-Johnson syndrome, etc.);

Exacerbation of underlying conditions (certain forms of eczema and dermatitis, vasculitis, nodular periarteritis, etc.).

The first group of drug complications is predominantly caused by IgE-mediated allergic reactions (anaphylactic shock, urticaria, Quincke's edema, bronchial asthma, allergic bronchitis, atopic dermatitis). Immune complex reactions also play a significant role in the development of other diseases in this group (serum sickness, Arthus-Sakharov phenomenon reactions), and some of them (agranulocytosis, thrombocytopenic purpura) may result from both cytotoxic and autoimmune reactions.

The involvement of cell-mediated reactions in the development of the second group of diseases is evident, but the role of humoral immunity in their occurrence cannot be excluded. It is likely that both humoral and cellular immune components are involved in the pathogenesis of these clinical forms of DA.

Rererences:

1. Аллергические болезни (диагностика и лечение). Р. Паттерсон, Л.К. Грэммер, П.А.Гринбергер и др.; под. ред. Р.Паттерсона.-М.: ГЭОТАР Медицина, 2020.-73 5 с
2. Сворт Р.Де., Паттерсон Р. Лекарственная аллергия // В кн.: Р.Паттерсон, Л.К.Грэммер, П.А.Гринбергер. Аллергические болезни. Диагностика и лечение. Москва: Из-во ГЭОТАР, Медицина, 2018. С.313-428.
3. Крапивница у детей. Клинические рекомендации. Союз педиатров России; 2018. [Urticaria in children. Clinical guidelines. Union of Pediatricians of Russia; 2018 (in Russ.)].
4. Степанова Е.В. Современные аспекты диагностики и лечения лекарственной аллергии. Лечащий врач. 2009;4:17–24. [Stepanova E.V. Modern aspects of the diagnosis and treatment of drug allergy. Attending doctor. 2019;4:17–24 (in Russ.)].
5. Dreyfus D.H. Urticaria and Angioedema. A Rational Approach to Diagnosis and Therapy. Skin Therapy Letter. 2023;18(1):4–9.