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Anaphylaxis as a cause of hospitalization — a single academic centre experience

Reakcje anafilaktyczne jako przyczyna hospitalizacji — doświadczenia ośrodka akademickiego

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Abstract

Introduction: In recent years, more and more often the increase in incidence of allergies is observed. According to the WHO, they are getting the fourth position amongst the most frequent diseases after cancers, cardiovascular diseases and AIDS. Anaphylaxis is a severe, life-threatening, systemic or generalised immediate hypersensitivity reaction. The analysis of the causes and the clinical picture of anaphylaxis in patients treated at single academic hospital centre was the purpose of the study.

Material and methods: The study was based on retrospective analysis of case records of the patients hospitalised at the Chair and Department of Allergology, Clinical Immunology and Internal Diseases, the Jan Biziel University Hospital in Bydgoszcz in the years 2005–2010. 132 patients, in whom anaphylactic reaction appeared, were analysed. The examined population included 70 men and 62 women at 16–95 years of age.

Results: The conducted examinations allowed to obtain information about the causes and the course of anaphylactic reactions. The problem of hypersensitivity to substances of various origin (biological or synthetic) can concern everyone irrespective of sex and age. Nevertheless, the phenomenon of anaphylaxis more often occurred in the examined men than women. Most cases of anaphylactic reactions were reported in the 26–50 age range. Based on the presented results, no regularity was observed in anaphylaxis clinical picture and its causative factor.

Conclusions: It is difficult to forecast the course of the reaction based on the causative factor, for anaphylactic reaction is characterised by a great individual changeability and intensity of the first symptoms.

Key words: anaphylaxis, analysis of causes, clinical picture

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Streszczenie

Wstęp: Z roku na rok coraz częściej obserwuje się wzrost zachorowań na choroby alergiczne. Według Światowej Organizacji Zdrowia zajmują one 4 pozycję wśród najczęstszych schorzeń po nowotworach, chorobach układu krążenia i AIDS.

Anafilaksja to ciężka, zagrażająca życiu, systemowa lub uogólniona, natychmiastowa reakcja nadwrażliwości. Celem pracy jest analiza przyczyn i obrazu klinicznego reakcji anafilaktycznych u pacjentów hospitalizowanych w ośrodku akademickim.

Materiał i metody: Badanie przeprowadzono na podstawie retrospektywnej analizy historii chorób pacjentów hospitalizowanych w Katedrze i Klinice Alergologii, Immunologii Klinicznej i Chorób Wewnętrznych Szpitala Uniwersyteckiego im. Jana Biziela

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w Bydgoszczy w latach 2005–2010. Przeanalizowano 132 historie chorób pacjentów, u których wystąpiła reakcja anafilaktyczna. Badana populacja obejmowała 70 mężczyzn i 62 kobiety w przedziale wiekowym 16–95 lat.

Wyniki: Przeprowadzone badania pozwoliły uzyskać informacje o przyczynach i przebiegu reakcji anafilaktycznych. Problem nadwrażliwości na substancje różnego pochodzenia (biologiczne czy syntetyczne) mogą dotyczyć każdego człowieka niezależnie od płci i wieku. Zjawisko anafilaksji w analizowanych historiach chorób częściej występowało jednak u mężczyzn niż u kobiet. Przedział wiekowy, w którym stwierdzono najwięcej przypadków reakcji anafilaktycznych, to 26.– 50. rok życia. Na podstawie przedstawionych wyników zaobserwowano brak prawidłowości pomiędzy obrazem klinicznym anafilaksji a czynnikiem ją wywołującym.

Wnioski: Istnieją poważne trudności w przewidywaniu przebiegu reakcji na podstawie czynnika sprawczego, tym bardziej że cechuje ją duża indywidualna zmienność w pojawianiu się pierwszych symptomów i stopnia ich nasilenia.

Słowa kluczowe: anafilaksja, analiza przyczyn, obraz kliniczny

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Introduction

Anaphylaxis is believed to be a timeless problem, and although medicine made a considerable progress in respect of immunology and pathophysiology of allergic reaction, anaphylaxis is still difficult to diagnose and treat [1-4].

Currently, the European Academy of Allergy and Clinical Immunology recommends to define anaphylaxis as a severe, potentially life-threatening systemic or generalised hypersensitivity reaction. Although the said proposition of 2001 is winning more and more supporters, a uniform and current definition of anaphylaxis has not been drawn up to date. The difficulty lies in the fact that such a definition should be considered in a wide clinical context, then it should concern IgE-dependent and IgE-independent reactions. To solve the problem, in 2005 American researchers defined anaphylaxis as a condition caused by IgE-dependent reaction, thus they separated anaphylactoid reactions as phenomena of identical clinical picture but IgE-independent [2-5].

Current economic and civilisation progress fosters atopic diseases. Every year, more and more people suffer from allergies. According to the WHO, allergies take the forth position among the most frequent diseases after cancer, cardiovascular diseases and AIDS. In recent years, a considerable increase in the prevalence of anaphylactic reactions among children has been observed. It has been confirmed by a retrospective population study, the Rochester Epidemiology Project, which has been conducted in the United States. It has shown 21 cases/100,000 persons/year in the 1980s, 49.8 cases/100,000 persons/year in the 1990s, and the increase up to 70 cases/100,000 persons/ /in the group of children and young people 0--19 years [2-6].

Together with the growth of the occurrence of anaphylaxis of various background in patients of different age, more and more researches have become interested in the problem, and despite the fact that many mechanisms still remains unclear, a complicated nature of the phenomenon is becoming plain [3-6].

The objective of the study was to analyse the causes and clinical picture of anaphylactic reactions in the patients hospitalised at Chair and Department of Allergology, Clinical Immunology and Internal Diseases, the Jan Biziel University Hospital in Bydgoszcz.

Material and methods

The study has been conducted basing on retrospective analysis of case records of the patients hospitalised at the Department of Allergology, Clinical Immunology and Internal Diseases, the Jan Biziel University Hospital in Bydgoszcz in the years 2005–2010. 132 case records of the patients, in whom anaphylactic reaction occurred, have been analysed. Each case record has been examined in terms of factors that could induce anaphylactic reaction. Statistical analysis included: patients' anaphylactic reactions to inhaled allergens, drugs, food and food additives, hymenoptera venom and other factors (cold, heat, stress, physical effort).

The cause and the course of anaphylactic reaction have been established on the basis of diagnosis given by the treating physician based on the patient's history, records from previous hospitalisations and additional tests performed during hospitalisations.

The study population included 70 men and 62 women in the 16-95 age range. The mean age of the patient was 43.41 ± 16.76 . Characteristic of the study group has been presented in Table

Table 1. Study group characteristics Tabela 1. Charakterystyka grupy badanej			
0–25	11	13	18%
26–50	30	40	53%
51–75	19	15	26%

2

76-95

1. In addition, the literature on the subject has been analysed.

2

3%

Results

The analysis of anaphylaxis in patients admitted to a single academic centre showed the following results: 53% of cases with anaphylactic reaction constituted men and 47% — women.

In the male population, as many as 40 anaphylaxis episodes occurred in the 26-50 age bracket. Among women, the prevalence of anaphylaxis was also the highest in the 26-50 age range and it amounted to 30 cases.

The patients usually reported to hospital with skin lesions (erythema, urticaria, pruritus), mucosal symptoms (lacrimation, rhinitis, dysphonia) and headache. Other symptoms were as follows: alimentary tract disorders (nausea, rectal tenesmus), dyspnoea, cardiovascular abnormalities (hypotonia, tachycardia, arrhythmia) and the feeling of fear.

In the group of men and women, anaphylactic reactions occurred most often after biting by hymenoptera insects (56% of men and 42% of women). The insects that most frequently induced anaphylactic reaction in the examined patients were bees (*Apis*), bumblebees (*Bombus*) and wasps (*Vespula*).

The second factor were drugs and then food. Drug-induced anaphylaxis occurred in 14% of men and 18% of women. The drugs that caused most often adverse reactions were: beta-lactam antibiotics, sulphonamides, salicylates, non-steroidal anti-inflammatory drugs and hormonal preparations.

Whereas food that most frequently induced allergic reactions included: celery, tomato, carrot, soya bean, wheat flour, nuts, milk, eggs.

A significant proportion of cases constituted anaphylactic reactions of unknown aetiology (21% of men and 29% of women). The results have been presented in Figure 1. Among men, as many as 37% of anaphylactic reactions presented as anaphylactic shock, 33% as systemic reactions, and 11% as Quinecke's oedema. In women, mild systemic reaction occurred most frequently (39%), then acute urticaria and Quincke's oedema (21%). Anaphylactic shock was observed in 19% of female patients. The results have been presented in Figure 2.

In 25% of women and 58% of men who had anaphylactic shock, it occurred with the loss of consciousness. The results have been presented in Figure 3.

Discussion

The conducted examinations allowed to obtain information about the causes and the course of anaphylactic reactions. Hypersensitivity to the substances of different origin (biological or synthetic) may affect everyone irrespective of sex and age. However, in the analysed case records, anaphylaxis occurred more frequently in men than women. The largest number of anaphylactic reaction cases was found in the 26-50 age range [7].

The factor that most often induced anaphylactic reaction in the study group was hymenoptera venom. It appeared in 56% of men and 42% of women. Hypersensitivity to the components of



Figure 1. Comparing causes of anaphylaxis in the population of women and men

Rycina 1. Porównanie przyczyn reakcji anafilaktycznych w populacji kobiet i mężczyzn



Figure 2. Clinical picture of anaphylaxis in the population of women and men

Rycina 2. Obraz kliniczny reakcji anafilaktycznych w populacji kobiet i mężczyzn



Figure 3. Percentage of the anaphylactic shock with and without a loss of consciousness in the population of women and men

Rycina 3. Procentowy rozkład wstrząsu anafilaktycznego z i bez utraty przytomności w grupie kobiet i mężczyzn, u których wystąpił ten objaw

hymenoptera venom to a large extent predisposes towards severe systemic reactions. According to the research conducted by Smorawska-Sabanty and Kowalski, systemic reaction of III or IV degree as a consequence of biting by a hymenoptera insect, occurs nearly in 60% of patients [8].

The subsequent risk factor are drugs. In the study group, drug-induced anaphylaxis occurred in 14% of men and 18% of women. Concomitant diseases, reduced immunity and disturbed functioning of enzymes system increase the probability of the occurrence of hypersensitivity reaction, similarly as the growth of self-treatment with accompanying polypragmasy [9–11].

Food also may cause anaphylactic reaction. Dairy products, citrus fruits, vegetables, starchy food and seafood quite often cause anaphylaxis. Zuidmeer et al. have found that the frequency of allergy to fruits in adults amounts to 0.4-3.5%, whereas in children under 3 years, it may even reach 11.5%. Vegetables induce anaphylactic reaction in 2.2% of adults and 13.7% of children < 18-month old, whereas starchy food including mainly wheat flour may cause reaction in more than 3% of adults and approximately 1% of children. Among the study subjects, food allergy was found in 9% of men and 11% of women [12–17].

Regrettably, the conducted analysis confirmed that in many cases, substances or products to which the patients were allergic have not been established. As many as 29% of women and 21% of men were not able to clearly indicate causative factor of anaphylactic reaction. It may be connected with intensive lifestyle, larger exposure to environmental factors and wrong behaviour being the result of bad habits. Similar conclusions were reached by Worn et al, who showed that a large proportion of anaphylactic reactions lacked information about allergens and intensifying factors [18–20].

In the clinical picture of anaphylaxis prevail shock, systemic reactions, acute urticaria and Quincke's oedema. The most dangerous for the patientis is an anaphylactic shock, which occurred in as many as 37% of men and 19% of women, and which in 58% of men and 25% of women occurred with the loss of consciousness. Most frequently it was caused by insect sting. Men are more threatened with this type of anaphylactic reaction, compared to women, for they more often work outdoor. An accurate evaluation of symptoms and their appropriate correlation with the causative factor of anaphylactic reaction, allows to undertake appropriate steps to avoid life-threatening condition [20-22].

Systemic reactions such as generalised urticaria, pruritus, vasomotor oedema, dyspnoea, strength reduction, a slight blood pressure decrease, stomachache, nausea and periodically elevated body temperature occurred in 39% of women and 33% of men. It was the effect of insect sting, drug usage, food consumption and a factor difficult to specify [20-22].

Similarly, acute urticaria and Quincke's oedema developed as a result of hypersensitivity to the mentioned factors. Acute urticaria manifesting itself in the form of intensive erythema and wheals in different parts of the body (usually the extremities and the trunk) occurred in 21% of women and 19% of men. It appeared together with strong itch, slight oedema of the involved parts and at times papular eruption, which were passing after administration of antihistaminic drugs. Urticaria is an immediate skin reaction to various substances that penetrate and cross a protective barrier of an organ, thus inducing symptoms of variable intensification and localisation [20-22].

Quincke's oedema occurred in 21% of women and 11% of men, and it affected mainly face, i.e. the lips, cheeks, tongue and eyelids without accompanying itch.

There is no regularity in clinical picture of anaphylaxis and its causative factor. It is impossible to foresee the course of reaction basing on the causative factor, for the reaction is distinguished by a great individual changeability in the first symptoms appearance and their intensification.

Conclusions

Anaphylaxis is a timeless problem and despite a considerable progress in medicine, it is still difficult to diagnose and treat. We still lack sufficient information about the causes of various reactions among patients, their intensification, the dynamics of the process and response to treatment. It is known that anaphylaxis is a phenomenon of immunological character and that it almost always occurs unexpectedly, frequently posing threat to human's life. It is related to the fact that initially mild symptoms may progress quickly, leading to a severe irreversible condition that may end in death.

Conflict of interest

The authors declare no conflict of interest.

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