

Case Series

Prevalence of Objectified Penicillin's Allergy in Patients Referred for Study at the Elda Health Department (Spain) and Specific IgE Predictive Value

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Abstract

A significant percentage of patients classified as allergic to beta-lactams don't really suffer from this kind of sensitization. It is important to study these patients correctly and completely. Our main objective was to determine what percentage of patients with suspected penicillin allergy are really sensitized. Our secondary objective was to assess the ability of specific IgE to diagnose allergy in terms of positive and negative predictive value. 41 adult patients were included, between September 1, 2019 and January 31, 2020. Only 8 patients (19.51%) were diagnosed as allergic. Regarding specific IgE as a diagnostic method, 75% false negatives were observed with high specificity (94%) and low sensitivity (25%). A positive predictive value of 100% and a negative predictive value of 84% were obtained. The study shows that a high percentage of patients previously labeled as allergic to penicillin are not sensitized. Carrying out diagnostic tests such as specific IgE, skin tests and tolerance would rule out many not allergic patients and the negative consequences that this entails would be reduced.

Keywords: Adverse reaction; Allergy; Penicillin; Specific IgE

Introduction

Adverse drug reactions account for more than 3% of hospital admissions and complicate hospital care for 10% to 20% of hospitalized patients [1]. Various studies indicate that most of the patients labeled as allergic to beta-lactams really don't suffer from this sensitization and tolerate penicillin and its derivatives [2].

Case Report

The objective of our study was to objectify what percentage of patients referred for study in the Department of Health of Elda (Alicante, Spain) with suspected allergy to penicillins are really allergic and which are not. In addition, we assess the ability of specific IgE (CAP) by itself to diagnose allergy to penicillins and its derivatives, in terms of positive and negative predictive value.

This is an observational, descriptive and cross-sectional study that includes 41 adult patients with initial suspicion of immediate allergy to penicillins included between September 1, 2019 and January 31, 2020. Patients who did not meet the inclusion criteria were excluded (age or non-immediate reactions) and patients with severe anaphylactic-type reactions in whom provocation with the presumed triggering drug was not indicated. The epidemiological variables are presented in Table 1.

The patients were subjected to a study according to the proto-

col usually carried out in these cases. In a first visit, we took the clinical history in order to establish the type of reaction suffered and the type of suspected immune response. In cases where the reaction was thought to be IgE-mediated, an analytical study was requested to determine specific IgE to penicillin G and V, ampicillin, amoxicillin, and cefaclor, normally including latex in the study. With a negative result, the patient underwent an in vivo study with prick and intradermal skin tests for penicillin G and V, amoxicillin, ampicillin, cefuroxime, and ceftriaxone. If the tests were negative, we proceeded to the last step with a sequential tolerance test.

Of the total number of patients who underwent the tests, 26 (63.41%) were women and 15 (36.59%) were men. Infection was the context of the most frequent reaction (58.54%) followed by reaction in childhood (24.39%) and lastly reactions associated with a surgical intervention (9.76%) or dental treatment (7.32 %).

Allergy to penicillins was observed in 8 cases, of which only 2 presented positive specific IgE, resulting in a false negative in the rest of the cases, in which sensitization was observed by skin test.

In 90% of the patients who reported an allergic reaction in childhood, an allergy to penicillins was ruled out. 75% of those diagnosed as allergic presented a reaction in the context of an infection treated with penicillin. It is striking that of the 41 patients only 8 (20%) were actually allergic.

Table 1: Epidemiological variables.

Patients included	41
Men/Women	15 (36,59%) / 26 (63,41%)
Average age	54,54 ± 5,88
Adverse reaction context	
Pediatric adverse reaction	10 (24,39%)
Infection	24 (58,54%)
Surgical adverse reaction	4 (9,76%)
Dental treatment	3 (7,32%)
Results	
Patients with objectified allergy	8 (19,51%)
Patients with positive specific IgE	2 (4,88%)
Patients' with the positive skin test	6 (14,63%)
Percentage of false negative IgE	6 (75%)
Patients with pediatric adverse reaction and allergy	1 (12,5%)
Patients with pediatric adverse reaction without allergy	9 (90%)
Patients with surgical adverse reaction with allergy	1 (12,5%)
Patients with infection and objectified allergy	6 (75%)
Patients with dental treatment and objectified allergy	0
Objectified penicillin allergy men/women	H 2 (25%) / M 6 (75%)

It should be mentioned that in patients with specific IgE or positive skin test the diagnosis was confirmed. We did not carry out a tolerance test because it would have posed a risk for the patient. Only if the above tests were negative were the patients subjected to an oral challenge with the suspected drug.

Discussion

We observed that most of the patients with a possible allergy to penicillins due to a reaction in childhood, really were not sensitized. Therefore, we affirm that there is an overdiagnosis of allergy to penicillins due to reaction in childhood. This has already been described in previous bibliography [3]. Studying patients correctly and completely would avoid this fact. We must bear in mind that years ago, non-protocolized tests were frequent, with numerous false positives. Many of these tests caused skin irritation.

As has been observed in the results, the analysis to detect specific IgE is a test that has high specificity and low sensitivity, so when a negative result is obtained, it could be thought that we are obtaining a false negative. For this reason, the next step is to perform the skin test. Regarding the terms PPV and NPV, a maximum PPV result (100%) has been obtained, which means that all patients positive for specific IgE have been diagnosed with allergies.

Finally, the results obtained also refer to the fact that the patients who have been diagnosed with positive CAP reported an infection as the cause of the onset of symptoms, while none of the patients who described a reaction in childhood, perioperative reaction or treatment dentists have detected penicillin-specific IgE in their laboratory tests.

Conclusion

This study shows that a high percentage of patients who have been previously labeled as allergic to penicillin are really not

(80%). It also indicates that there are numerous patients who, due to not being well diagnosed, avoid the use of these antibiotics which has as a consequence the use of broad-spectrum antibiotics and an increased risk of suffering infections due to *Clostridium difficile*, *Staphylococcus. methicillin-resistant aureus*, prolonged hospital stays, and possible complications [4]. They also state that there is an overdiagnosis of allergy to penicillin in the pediatric population because in many cases diagnostic tests are not performed and the diagnosis is based on symptoms compatible with viral skin reactions, family history of allergy to penicillin or drug-virus interactions [5]. We believe that it is essential to screen people with suspected penicillin allergies so that they are not mistakenly labeled as allergic to penicillins.

Contribution by each author

Both authors have carried out substantial contributions to the conception or design of the work and we meet the requirements approved by the International Journal of Clinical Studies and Medical Case Reports (IJCMCR).

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