

Case report

Urticaria caused by sensitization to aztreonam

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A 72-year-old woman presented with generalized urticaria after receiving an injection of aztreonam. After successive *in vitro* and *in vivo* studies, allergy to aztreonam with a good tolerance of the other β -lactams was diagnosed.

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Aztreonam is the main representative of a new group of β -lactams, the monobactams (3). Aztreonam's known lack of cross-reactivity with penicillin makes it a useful drug for patients allergic to penicillin (1, 8–10, 12). A few patients reacting to aztreonam have been described (4–7, 11) in whom a good tolerance to the other β -lactams was usually observed.

Case history

A 72-year-old woman was referred to our department because of the appearance in previous months, a few minutes after an injection of aztreonam (because of a urinary infection), of a pruriginous sensation at the injection site. This subsequently spread to the rest of the body, with the appearance of wheals and facial, plantar, and palmar angioedema, without accompanying systemic symptoms, except for a sensation of general discomfort. She was treated with 6-methylprednisolone and promethazine, after which the symptoms largely disappeared within 1 h and had completely disappeared after 24 h.

The patient also reported that more than 10 years previously she had presented with facial erythema and suspicious wheals after the injection of penicil-

lin G and procaine with streptomycin. Consequently, since then, she had avoided penicillin.

RAST with benzylpenicilloic-polysin was performed and proved to be negative. Subsequently, skin tests were performed with the various drugs used in the prick test and I.D. (Table 1), and were positive in I.D. with aztreonam at concentrations of 2 and 20 mg/ml. To complete the study, we performed challenge tests with therapeutic doses of penicillin, procaine, and streptomycin, producing negative results.

In view of the negative results obtained with the same concentrations of aztreonam in two patients and the compatible clinical picture, the patient was diagnosed as having urticaria caused by sensitization to aztreonam.

Discussion

Aztreonam is the main representative of a new group of β -lactams, the monobactams (1), which, unlike the other β -lactams, have only one cyclic ring (9) (Fig. 1). It has been presented as a broad-spectrum antibiotic that is highly effective against Gram-negative bacteria (8, 10). Initially, skin tests per-

Table 1. Skin tests performed on our patient

Skin tests	
Prick	I.D.
Prepen 6×10^{-5}	Prepen 6×10^{-5}
MDM 0.5 mg/ml	MDM 0.5 mg/ml
Penicillin 10 000 UI	Penicillin 10 000 UI
Procaine	
Procaine 1/100	Procaine 1/100
Streptomycin 10 mg/ml	
Streptomycin 100 mg/ml	
Streptomycin 1000 mg/ml	
Aztreonam 2 mg/ml	Aztreonam 2 mg/ml
Aztreonam 20 mg/ml	Aztreonam 20 mg/ml
Aztreonam 200 mg/ml	
Aztreonam 2000 mg/ml	

Prepen=penicillin polylysine; MDM=mixture of penicillin, penicilloate, and penilloate.

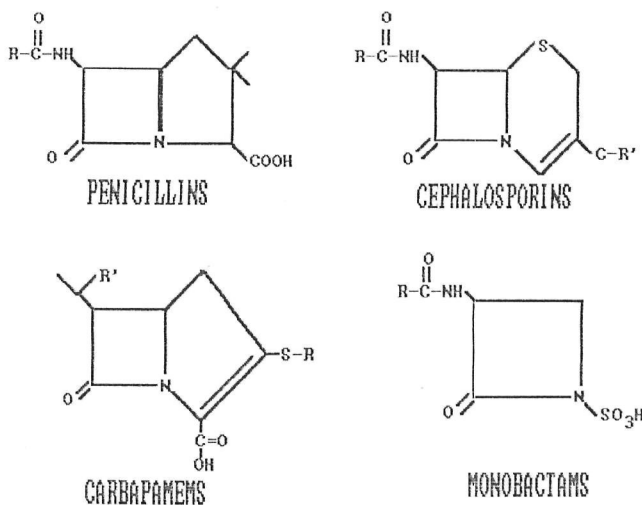


Fig. 1. General structure of the four β -lactam antibiotics in use today.

formed by Saxon et al. (9), using *in vivo* tests analogous to the largest and smallest penicillin determinants in patients allergic to penicillin, indicated that there could be some cross-reactivity (of 41 patients, four were positive to aztreonam determinants). However, later studies in which patients allergic to penicillin were treated with aztreonam without problem (12) have shown the lack of cross-reactivity with penicillin; consequently, it is quite safe in these patients.

Indeed, since then, only four cases of reactions have been reported in the literature (4, 5, 7, 11): one renal failure with skin reaction and eosinophilia, two generalized skin reactions, and, recently, one skin reaction after penicillin, aztreonam, and imipenem. Complete tests were performed in only one of the patients, who tolerated the other β -lactams. In studies performed *in vitro* by Adkinson et al. (2), it is

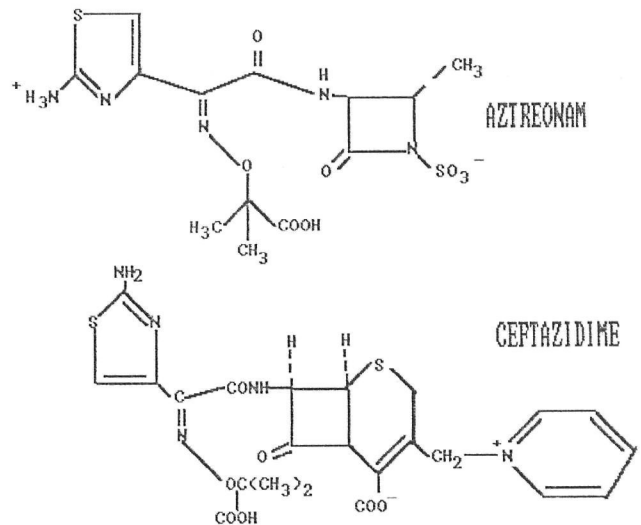


Fig. 2. Chemical formulas of aztreonam and ceftazidime.

stated that, unlike those of other β -lactams, the reactions to aztreonam would be caused more by its side-chain than its cyclic ring, the side-chain being fully inhibited only by ceftazidime, which is the only drug that has the same side-chain (Fig. 2). This suggests that these patients should be prohibited from taking any medicine that has the same chain.

On the basis of our experience and of other published cases, we consider that aztreonam is a highly effective drug in patients allergic to penicillin. Reactions to aztreonam are very rare and generally do not contraindicate the other β -lactams. In view of ceftazidime's chemical structure, it would be wise to prohibit it in patients allergic to aztreonam. However, these studies should be performed in other cases to confirm these hypotheses.

References

- ADKINSON NF Jr. Immunogenicity and cross-allergenicity of aztreonam. *Am J Med* 1990; 88: 128-58.
- ADKINSON NF Jr, SWABB EA, SUGERMAN AA. Immunology of the monobactam aztreonam. *Antimicrob Agents Chemother* 1984; 25: 933-5.
- ALVIN C. Aztreonam: a review of the first monobactam. *Am J Med Sci* 1991; 302: 46-9.
- HANTSON P, DE CONINCK B, HORN JL, MAHIEU P. Immediate hypersensitivity to aztreonam and imipenem. *BMJ* 1991; 302: 294-5.
- IGLESIAS CADARSO A, SAEZ JIMENEZ SA, VIDAL PAN C, RODRIGUEZ MOSQUERA M. Aztreonam-induced anaphylaxis. *Lancet* 1990; 336: 746-7.
- MOSS RB, MCCLELLAND E, WILLIAMS RR, HILMAN BC, RUBIO T, ADKINSON NF. Evaluation of the immunologic cross-reactivity of aztreonam in patients with cystic fibrosis who are allergic to penicillin and/or cephalosporin antibiotics. *Rev Infect Dis* 1991; 13 (Suppl. 7P): 8598-607.
- PAZMIÑO P. Acute renal failure, skin rash, and eosinophilia associated with aztreonam. *Am J Nephrol* 1988; 8: 68-70.
- SAXON A. Aztreonam in the management of Gram-negative infections in penicillin-allergic patients: a review. *Pediatr Infect Dis J* 1989; 8(Suppl. 9): S124-7.

9. SAXON A, BEALL GN, ROHR AS, ADELMAN DC. Immediate hypersensitivity reactions to beta-lactams antibiotics. *Ann Intern Med* 1987; 107: 204–15.
10. SOBEL JD. Imipenem and aztreonam. *Infect Dis Clin North Am* 1989; 3: 613–24.
11. SOTO ALVAREZ J, SACRISTAN DEL CASTILLO JA, SAMPEDRO GARCIA I, ALSAR ORTIZ MJ. Immediate hypersensitivity to aztreonam. *Lancet* 1990; 335: 1094.
12. VEGA JM, BLANCA M, GARCIA JJ, et al. Tolerance to aztreonam in patients allergic to beta-lactams antibiotics. *Allergy* 1991; 46: 196–202.

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