Medical Myth

Ten percent of patients who are allergic to penicillin will have serious reactions if exposed to cephalosporins

Cephalosporins and penicillins share a common beta-lactam ring. It is commonly taught that at least 10% of patients who are allergic to penicillin will have an adverse reaction to cephalosporins. This potential cross-reactivity has extremely important therapeutic implications because many serious infections are best treated with cephalosporins as first-line therapy.

In considering cross-reactivity, two important points must be made. First, true penicillin allergy is not common. Graff-Lonnevig et al[1] noted that in a cohort of 298 children whose parents gave the history of penicillin allergy, only one had a positive result on a radioallergosorbent test (an in vitro test of penicillin allergy). A 10-day course of antibiotics was given to the other 297 patients. Only 10% of children had any reaction that was consistent with allergy, and 22 of these 30 reactions occurred after day 7. In a similar study by Surtees et al,[2] of 132 patients referred from British general practitioners, only 4 were confirmed to have an allergy by radioallergosorbent test. The remaining 128 were given a single dose of oral penicillin and had no allergic reaction. The true incidence of allergy in patients with a history of penicillin allergy is substantially less than 10%; therefore, the cross-reaction rate between penicillins and cephalosporins must certainly be less.

> The cross-reaction rate between third-generation cephalosporins and penicillin approaches 0%

Second, most of the evidence suggests that a cross-reaction between penicillin and cephalosporins is rare, perhaps no greater than that between penicillins and structurally unrelated antibiotics. Anne and Reisman[3] reviewed data from published series and postmarketing reports from drug manufacturers. Serious allergic reactions to cephalosporins occur in about 0.02% of patients who take the antibiotic. The rate of serious reactions in patients with a penicillin allergy appears to be twofold to fourfold this baseline rate. However, a threefold baseline rate of serious reactions is seen in patients with penicillin allergy when they are given a structurally unrelated antibiotic.

These data suggest that a history of penicillin allergy is a general risk factor for allergic manifestations to antibiotic administration and is not specific to cephalosporins. The authors note that the initial studies that suggested a high cross-reaction between penicillin and first-generation cephalosporins were done when issues with the manufacturing process meant that cephalosporins were frequently contaminated with penicillin. The cross-reaction rate between third-generation cephalosporins and penicillin approaches 0%.[3]

Anne and Reisman also note that skin testing does not differentiate those patients in whom a serious reaction to cephalosporins will develop.[3] The myth that a high rate of cross-allergy between penicillin and cephalosporins exists needs to be exposed so that patients who need cephalosporins will be given them whether or not they have a history of penicillin allergy. Physicians should note that patients with true penicillin allergy are at slightly increased risk of an allergic reaction when given any antibiotic.

References

1 Graff-Lonnevig V, Hedlin G, Lindfors A. Penicillin allergy: a rare paediatric condition? *Arch Dis Child* 1988;63:1342-1346.
2 Surtees SJ, Stockton MG, Gietzen TW. Allergy to penicillin: fable or fact? *BMJ* 1991;302:1051-1052.
3 Anne S, Reisman RE. Risk of administering cephalosporin antibiotics to patients with histories of penicillin allergy. *Ann Allergy Asthma Immunol* 1995;74:167-170.

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capsule

Watching television can alter self image Television came to Fiji as late as 1995 and there is still only one channel, which mainly shows programs from the United States, Australia, and Britain. But will its arrival be associated with an increase in childhood eating disorders? A recent report suggests that teenage girls who watch television at least three times a week are 50% more likely than others to see themselves as fat and 30% more likely to diet (*JAMA* 2000;283:1409). Eating disorder symptoms have increased fivefold since the introduction of television.