Peer reviewed article

Lack of cross-reactivity between cefotaxime and imipenem

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Introduction

Cephalosporins and carbapenems are structurally related, since they share the same β-lactam ring and are potentially able to induce hypersensitivity reactions [1]. Cross-reactivity between imipenem and cephalosporins has not been described. We report the case of a patient who developed an allergic skin reaction to cefotaxime and subsequently tolerated imipenem.

Case report

An 18-year-old tetraplegic male was admitted in the Infectious Diseases Department for urinary tract infection (UTI). After urinary sampling for cytobacteriological examination, empirical antibiotic therapy with cefotaxime 1 g IV and gentamicin 80 mg IM was started. Three hours later the patient developed an erythematous maculopapular and pruritic rash over almost the entire body. Neither oedema nor dyspnoea was present and blood pressure (BP) was 120/70 mm Hg. Haematological and biochemical parameters, in particular eosinophils (300/mm^3), were normal. Serological tests for hepatitis B and C and Epstein Barr virus were all negative. Discontinuation of cefotaxime and intravenous administration of dexamethasone resulted next day in complete resolution of the eruption. Urinary cytobacteriological examination and antibiotic sensitivity testing revealed a leukocyte count of 500/mm^3 and the presence of *Klebsiella pneumoniae* sensitive only to imipenem, amikacin and colimycin. In view of the absolute need to treat the UTI and the benignity of the exhibited rash, we decided to treat the patient with a full dose of imipenem. With his consent we administered, under close clinical oversight, imipenem 1 g IV drip for 2 hours. No signs of clinical intolerance – either rash or dyspnoea – were present and BP averaged 130/80 throughout the infusion and 2 hours afterwards. Courses of imipenem 3 g/day and amikacin 1 g/day were administered for 14 and 5 days respectively, with no sign of skin eruption or significant change in haemodynamic status throughout the course. Treatment resulted in complete normalisation of the urinary cytobacteriological examination performed 2 days after imipenem was started.

Discussion

Our case presents a patient allergic to cefotaxime who tolerated treatment with imipenem. We believe that the allergic rash was related to cefotaxime, for the following reasons: the temporal relationship between the start of cefotaxime therapy and the cutaneous eruption, the resolution of the skin lesion after cefotaxime withdrawal and the absence of other medication to which it might be attributable. Like cephalosporins, carbapenems belong to the β-lactam antibiotic group but are reserved for the treatment of severe infections by highly resistant organisms [2]. Cefotaxime and imipenem are structurally related, since they share the same β-lactam ring and would be expected to have a similar propensity to cause hypersensitivity reactions [3]. Unlike that between penicillins and cephalosporins [4], and vice versa [5], cross-reactivity between cephalosporins and carbapenems had not been described in the literature. This case demonstrates the safe use of imipenem in a patient with a history of cefotaxime allergy. Since our patient tolerated imipenem even though exhibiting an allergic reaction to cefotaxime, it can be argued that sensitisation was not to the β-lactam ring but to one of the side chains included in the chemical structure of cefotaxime. While we are naturally not recommending systematic prescription of imipenem in patients allergic to cephalosporins, we show that if clinical circumstances require it is possible to try imipenem in patients who exhibit allergic reactions to cefotaxime. As far as we are aware this is the first case to demonstrate the lack of reactivity to imipenem in a patient with a known allergy to cefotaxime.

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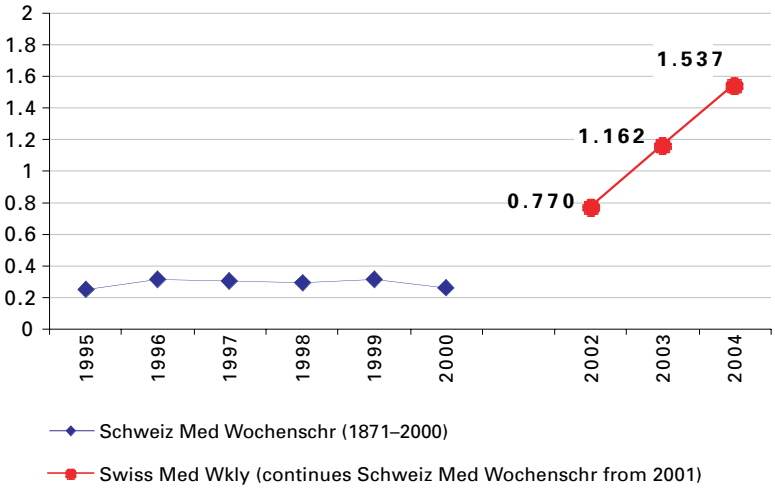

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