

## **Diagnosing penicillin allergy in children: Results of a 5-days challenge**

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### **Introduction**

Drug allergy is uncommon in children although many children are suspected to be allergic to penicillins. It is unclear whether a challenge test with a single therapeutic dose of the culprit drug is sufficient to elicit reactions in children. Purpose: To investigate whether a prolonged duration of the provocation test with penicillins elicits additional positive reactions in children.

### **Methods**

In a prospective study, 104 children with a history of an allergic reaction to penicillins underwent an extended challenge. All children had negative specific IgE to penicillin G and V, ampicillin and amoxicillin (ImmunoCap, Thermo Fisher Scientific). A titrated 2-step challenge was performed with the culprit drug: 1/10 and 1/1 of a therapeutic dose with 60 minutes interval followed by 2 hours observation at the department. In case of no reaction the challenge continued at home with three daily doses for five days. The study was performed from March 2014 to April 2017 at the Department of Pediatrics, Regional Hospital Central Jutland.

### **Results**

A total of 104 children (boys 57 %) aged 8 months to 14 years (mean 4.7 years) had either a history of urticaria (48.0 %) maculopapular rash (44.2 %) erythema multiforme (1.9 %) angioedema (1.9%), trouble breathing (0.9 %) or gastrointestinal symptoms (2.8 %) related to treatment with penicillin. The culprit drug was penicillin V (47 %), amoxicillin (40.3 %), dicloxacillin (5.7 %), mecillinam (2.9 %) amoxicillin/ clavulanic acid (1.9 %), and ampicillin (1.0 %). Seven (6.7 %) children had a positive challenge. Four of the children had a positive reaction at the department within 2 hours after either 1/10 (1 child) or a 1/1 dose (3 children). Two children had a cutaneous reaction at home at day 1 (more than 8 hours after 1/1 therapeutic dose) and one child reacted at day 4 of the provocation test with cutaneous symptoms.

### **Conclusion**

In this study 42% of the positive reactions were observed during the prolonged provocation at home. Extending the duration of the challenge seems to be useful in diagnosing penicillin allergy in children.