

Allergy to a tetracycline preparation—a case report

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Summary

Immediate asthmatic and urticarial reactions were provoked in an affected subject by ingestion of a commercial combination of three tetracyclines. No reactions were elicited by the tetracyclines given separately or prepared together as a powder; this was perhaps due to tachyphylaxis, since a test with the commercial preparation 2 months later elicited the reactions again. No reactions were elicited by the blue coating of the commercial preparation or by tartrazine.

Introduction

Allergic reactions to the tetracycline group of drugs are uncommon (Editorial, 1965; Olson & Riley, 1966). However, anaphylactoid reactions to oral demethylchlortetracycline have been described (Greenberg & Greenspan, 1962; Pollen, 1964) and also to tetracycline (Fellner & Baer, 1965). Cross-sensitization occurs between different tetracyclines (Goodman & Gilman, 1970).

We report here a patient with an anaphylactic reaction to tetracycline confirmed by oral provocation testing.

Case history

A 16-year-old boy was referred to the allergy clinic by his general practitioner with suspected tetracycline allergy. The boy had childhood eczema and allergic rhinitis and asthma from the age of 2 years. His asthma was aggravated by exposure to animal hair and dander and house dust. Between the ages of 11 and 16 he had three episodes of urticaria. The first was unexplained and the second coincided with visiting a friend who had a hamster. The third was related to oral administration of Deteclo 2 tablets (containing chlortetracycline 115.4 mg, tetracycline 115.4 mg and demethylchlortetracycline 69.2 mg per tablet) for an upper respiratory tract infection. He was on continuous sodium cromoglycate 1 capsule twice daily as prophylactic treatment for his asthma at this time.

Within 1 hr of taking Deteclo he developed an urticarial rash on the trunk, swelling of the lips and mouth and bronchial asthma. These subsided spontaneously after 1 hr.

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He was admitted to hospital 3 months after this episode for provocation tests with components of the Deteclo tablets to determine the aetiological agent for the reaction.

On examination he had mild generalized eczema but no other abnormalities. There was no audible wheezing. Sodium cromoglycate was stopped during the admission.

Skin prick tests with twenty-three common allergens were positive to house dust mite (*D. pteronyssinus*), dog and horse hair. Chest X-ray was normal. Lung function tests showed FEV₁ 4.95 l (predicted 4.30 l) and FVC 5.60 (predicted 5.10). Prick tests with a carbol-saline solution of tetracycline at 1 mg/ml and 10 mg/ml were negative.

Provocation testing

The tests done and the results are shown in Table 1. Besides the tetracyclines, Deteclo tablets contain FDC Yellow no. 5 tartrazine (0.27 mg per tablet) and are coated with a blue glaze containing FDC Blue no. 2 (0.0056 mg per tablet). The tablets also contain several inert fillers which were not tested for individually. All substances were swallowed in gelatine capsules and the FEV₁ measured before the test and at 10 min intervals afterwards up to 1 hr using a dry wedge spirometer (Vitalograph). If more than one test was done on one day a 2-hr interval was left between each test.

Table 1.

Test day	Substance	Reaction
1	Two tablets of Deteclo	Asthma and urticaria
2	100 mg tetracycline	Nil
	150 mg chlortetracycline	Nil
	250 mg demethylchlortetracycline individually	Nil
3	Blue coating of one Deteclo	Nil
	One tablet of Deteclo	Mild itching No urticaria
4	1 mg tartrazine	Nil
	Blue coating of two Deteclo	Nil
5 and 6	No tests performed	
7	230 mg tetracycline	} Nil
	250 mg chlortetracycline	
	150 mg demethylchlortetracycline together	
8	6 mg tartrazine	Nil
	Two tablets of Deteclo	Nil
<i>Two months later</i>		
9	1 mg tartrazine	Nil
	5 mg tartrazine	Nil
	One tablet of Deteclo	Asthma and urticaria

During the first test with Deteclo (day 1) he developed skin itching after 15 min together with tightness in the chest. His FEV₁ fell from 4.85 l to 1.75 l (a 63% fall) at 45 min, at which time there was marked urticaria over the trunk but no facial or oral swelling. The reaction was improving by 1 hr and was over by 2 hr. A blood eosinophilia of 740 cu/mm was recorded during the reaction, which had been within normal limits before the reaction.

On the final test (day 9) after a 2-month interval the reaction to Deteclo was similar with a fall from 4.5 to 2.8 l in FEV₁ (37%) maximum at 55 min and over by 90 min.

Discussion

Oral provocation testing confirmed the clinical diagnosis of sensitivity to the tetracycline preparation in this boy. In workers who developed asthma in the course of the manufacture of anti-biotics, inhalation type tests of these in powder form provoked non-immediate asthmatic reactions and identical asthmatic reactions were elicited when they were given the relevant antibiotics by mouth in usual treatment dosage and form, thus contra-indicating their clinical use (Davies, Hendrick & Pepys, 1974). These observations are of practical importance as antibiotics are commonly used to treat respiratory infections, and if this were associated with worsening of the bronchial symptoms or the appearance of asthma, a confused clinical situation could arise. When in doubt, administration of a therapeutic dose under controlled conditions is indicated.

It is of interest that challenges with the individual components of Deteclo on the days succeeding the first challenge failed to provoke any response and rechallenge with Deteclo on day 3 only produced mild skin irritation. The colouring agents were not shown in any tests to cause asthma, although tartrazine can provoke attacks, particularly in aspirin sensitive patients (Chafee & Settupane, 1967; Samter & Beers, 1968; Juhlin, Michaelsson & Zetterstrom, 1972). Rechallenge with the tetracyclines in one tablet of Deteclo 2 months later produced a further anaphylactic reaction.

These results suggest that after an anaphylactic reaction to a tetracycline preparation, which may be mediated by reaginic antibody (Fellner & Baer, 1965), there is a latent period before the reaction can be triggered again. This may be a form of bronchial hyposensitization similar to that described by McAllen (1961) after repeated bronchial challenge with pollen or house dust extracts. It is also of interest that the initial reaction to Deteclo at home was not inhibited by the sodium cromoglycate he was taking at that time.

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