

Investigation of possible adverse allergic reactions to mycoprotein ('Quorn')

R. D. TEE, D. J. GORDON, J. A. WELCH and A. J. NEWMAN TAYLOR

Department of Occupational and Environmental Medicine, National Heart and Lung Institute,
Royal Brompton Hospital, London

Summary

Mycoprotein ('Quorn') is a food produced for human consumption from *Fusarium graminearum*. Crossreactivity studies showed that mycoprotein shared multiple common allergenic determinants with *Aspergillus fumigatus* and *Cladosporium herbarum* and some with *Alternaria alternata*. There is, therefore, a potential for mould allergic patients to react adversely to inhaled or ingested mycoprotein. Mycoprotein RAST screening of mycoprotein production workers was made during a 2 year period. Two of the production workers had specific RAST binding $\geq 2\%$ but none reported symptoms. Two of 10 patients referred to hospital following vomiting and diarrhoea after ingestion of mycoprotein had a mycoprotein skin-prick test weal ≥ 2 mm but none had a significantly raised RAST. These largely negative results are important and reassuring because consumption of the product in the U.K. is now widespread and increasing.

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Introduction

Mycoprotein is a food produced for human consumption by Marlow Foods Ltd, U.K. by continuous fermentation of *Fusarium graminearum* (Schwabe) on a glucose substrate. Known as 'Quorn' it is widely available in most leading U.K. retailers where it has been on sale since 1985. As distribution has increased a small number of complaints have been received from consumers reporting symptoms of vomiting after eating Quorn mycoprotein. By June 1992 total unit sales with mycoprotein had reached 25 million and the frequency of reported complaints was 1.5 per million products sold.

To investigate whether mycoprotein would cause allergic responses either in exposed production workers or in those ingesting 'Quorn', immunological studies were made.

Materials and methods

Antigen extracts

Three mycoprotein extracts were used in these studies:

- (i) Lyophilized mycoprotein extract prepared by

Dome/Hollister-Stier Miles Laboratories, Bridgend, U.K.

- (ii) An aqueous extract was made of freeze-dried 'Quorn' supplied by Marlow Foods. The 16 hr extract was filtered, dialysed and lyophilized.

- (iii) An aqueous extract was made similarly of fresh 'Quorn' supplied by Marlow Foods.

Cultures of *A. fumigatus*, *A. alternata* and *C. herbarum*, containing mycelia and spores, were prepared by Allergon AB, Engelholm, Sweden, and then extracted and lyophilized by Dome Hollister-Stier.

Study groups

- (i) In 1985 sera from 12 mycoprotein production workers were assayed for specific IgE antibodies to mycoprotein (antigen 1) by RAST. In 1987 sera from 29 production workers were screened; these included eight subjects who had been tested in 1985. No workers complained of respiratory symptoms.

- (ii) In 1991, during a period of 6 months, 10 complainants reported acute symptoms of vomiting and diarrhoea shortly after eating mycoprotein. They were referred to hospital, where skin-prick tests and RAST measurements to all three mycoprotein antigens were undertaken.

Correspondence: Dr R. D. Tee, Department of Occupational and Environmental Medicine, National Heart and Lung Institute, Royal Brompton Hospital, London SW3 6LR.

affected after eating it, and the prevalence of reported complaints was low. Specific IgE antibody to mycoprotein was not significantly raised in any complainant. The possibility can not be excluded of participation of fungal polysaccharide allergens, which RAST testing would probably not detect, or of non-IgE associated mechanisms. Intolerance to ingested Quorn reported by a small number of consumers may be due mainly to an idiosyncratic response. These largely negative results are important and reassuring because consumption of the product in the U.K. is now widespread and increasing.

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