

Work related respiratory and nasal symptoms in UK bakers

Relationship to wheat flour and enzyme sensitisation

D Fishwick, J Elms, S Rahman, M Stocks, J Waterhouse, A Proctor, C Billings, A Garrod, AD Curran.

Sheffield Occupational & Environmental Lung Injury Centre, Health & Safety Laboratory, Broad Lane, Sheffield S3 7HQ, UK and The Health and Safety Executive, UK.

Introduction

- Exposure to airborne allergens such as wheat, rye, barley and oats is commonplace in the UK baking industry
- Whilst respiratory allergy to these components of the baking mix are well recognised, new cases of occupational asthma still occur
- The baking process is becoming increasingly more complex, and modern baking techniques include the addition of various enzymes in bread improvers, to alter the final product according to the customers specifications
- Less data are available regarding exposure to, and sensitisation to these additives, and again little is known about respiratory symptoms associated with such exposures



Methods

- We studied a large population of UK bakers, working in craft bakeries
- Clinical assessment was made with a standard respiratory questionnaire, recording respiratory and nasal symptoms, and their potential work relation
- RAST assessment for specific serum IgE was carried out to wheat, rye, barley, oats, fungal α -amylase (FAA) and bacterial α -amylase (BAA)
- Workers were divided into 3 sensitisation groups
 - Group 1; not sensitised
 - Group 2; sensitised to wheat flour only
 - Group 3; anyone sensitised to FAA or BAA
- Workers were divided into 3 symptom groups
 - No symptoms
 - Non work related nasal or respiratory symptoms
 - Work related nasal or respiratory symptoms



Results

- 185 bakers were included, of whom 154 (83%) had RAST assessment.
- The table shows the relationships between sensitisation and symptoms



Sensitisation status	Symptom present	Symptom absent	Odds Ratio (95% CI) compared to group 1	Odds Ratio (95% CI) between groups 2 and 3
	Respiratory	Respiratory		
1	72	62	1.0	-
2	10	1	8.61 (1.07-71.4)	1.0
3	7	2	3.01 (0.60-15.15)	0.35 (0.03-4.65)
	Work related respiratory	Work related respiratory		
1	25	109	1.0	-
2	3	8	1.64 (0.41-6.61)	1.0
3	4	5	3.48 (0.87-13.93)	2.13 (0.33-13.81)
	Nasal	Nasal		
1	43	91	1.0	-
2	3	8	0.79 (0.20-3.14)	1.0
3	8	1	16.93 (2.05-142.85)	2.13 (1.81-250)
	Work related nasal	Work related nasal		
1	47	87	1.0	-
2	5	6	1.54 (0.45-5.32)	1.0
3	8	1	14.8 (1.79-122.01)	9.6 (0.88-105.17)

Conclusions

- This study has noted a significant level of sensitisation to baking enzymes. 9 workers (6%) were noted to have a positive RAST to one of two enzymes
- Sensitisation to enzymes irrespective of wheat flour sensitivity was associated with non work related and work related nasal symptoms, but wheat flour sensitisation alone was not associated with nasal symptoms
- In addition, whilst any work related respiratory symptom was not associated with enzyme sensitisation as a group, work related chest tightness (OR 8.1, 1.9-34.4) and work related wheeze (OR 6.2, 1.4-28.6) were.
- These limited cross sectional data suggest that enzyme sensitisation in the UK baking industry may be an important predictor (and more important than wheat flour sensitisation alone) of subsequent work related symptoms