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P130 FEASIBILITY STUDY OF A PRIMARY CARE SCREENING TOOL FOR OCCUPATIONAL ASTHMA

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Introduction Occupational asthma (OA) accounts for 1 in 6 cases of adult-onset asthma and is associated with an estimated societal cost in the UK of £100 million/annum.¹ However many workers with OA go undiagnosed or experience a lengthy delay in diagnosis,² and primary healthcare professionals fail to enquire about patients' occupations and the effect of work on asthma symptoms.³ We evaluated the feasibility of introducing an electronic screening tool for OA in primary care.

Methods A prospective feasibility study was undertaken over a 3-month period in 4 primary care practices in Birmingham, UK. Practices modified their existing electronic health records (one of: EMIS, SystemOne, Vision) with a customised asthma review template embedding the questions "What is your occupation?" and "Are your symptoms better away from work on days away/on holiday?" Baseline practice-level data were gathered and at the end of the study period all exposed healthcare professionals (GPs, practice nurses) were invited to complete an online questionnaire intended to evaluate utility and willingness to use the tool.

Results Prevalence of Read-coded asthma was 5.6–8.2% and Read-coded OA was 0–0.7%. All 4 practices incorporated the screening tool without any technical difficulty. 24/52 (46%) exposed GPs/nurses returned questionnaires, of whom 10 (42%) had used the tool; uptake was higher (85%) in those professionals who were given brief training. Healthcare professionals who did use the screening tool found it to be user-friendly (clear, concise, logical) with no perceived procedural or IT difficulties or significant added burden. Responders were less confident (44% agreed/strongly agreed) about how to act when patients had work-related asthma symptoms and 78% agreed/strongly agreed that further training in managing health aspects of suspected occupational asthma would improve the screening tool.

Conclusion An electronic screening tool for OA can be easily and quickly incorporated into existing asthma disease management systems. Its utility could be greatly improved by user instruction and training in further clinical management of the patient with work related asthma symptoms.

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P131 UNDERSTANDING HEALTH BELIEFS AND BEHAVIOUR IN WORKERS WITH OCCUPATIONAL ASTHMA

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Introduction Long delays from symptom onset to the diagnosis of occupational asthma have been reported in the UK, Europe and Canada and workers are often reluctant to seek medical help or workplace solutions for their symptoms.^{1,2} Reducing this

delay could improve workers' quality of life, and reduce the societal cost of occupational asthma. This study aimed to explore reasons behind such delays.

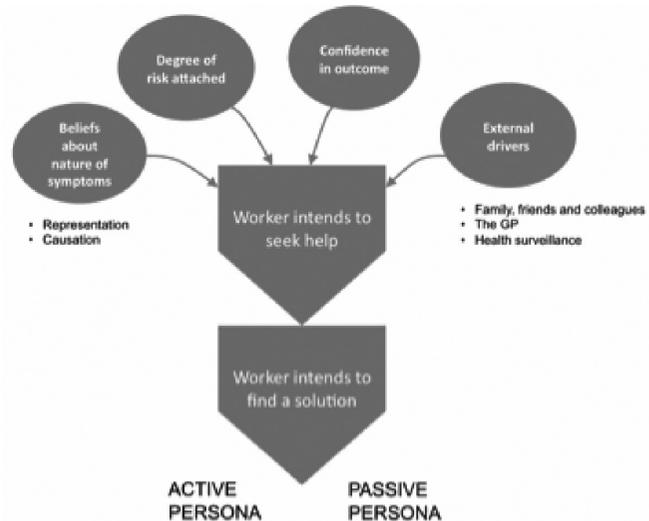
Methods A purposive sample of 20 individuals diagnosed with, or under investigation for, occupational asthma (median age=52; 70% male; 80% white British) undertook a single semi-structured interview. Interviews were transcribed verbatim and thematic analysis was undertaken in order to explore health beliefs and identify barriers to diagnosis.

Results Four themes were identified: (1) workers' understanding of symptoms, (2) working relationships, (3) workers' course of action and (4) workers' negotiation with healthcare professionals. Understanding of symptoms varied between individuals, from a lack of insight into the onset, pattern and nature of symptoms, through to misunderstanding of what they represented, or ignorance of the existence of asthma as a disease entity. Workers described reluctance to discuss health issues with managers and peers, through fear of job loss and a perceived lack of ability to find a solution.

Conclusion The evolution of workers' understanding depended upon how actively they looked to define symptoms or seek a solution. Proactive workers were motivated to seek authoritative help and negotiate inadequate healthcare encounters with GPs. In summary there appear to be a number of key influences motivating a worker to seek an explanation for their symptoms or a definitive solution, which are represented in the model in Figure 1. Understanding workers' health beliefs will enable policy makers and clinicians to develop better workplace interventions for identifying occupational asthma.

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Abstract P131 Figure 1 The major influences on workers' health-seeking behaviour

P132 CLEANER'S ASTHMA : NOW YOU SEE IT, NOW YOU DON'T

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A number of epidemiological investigations have identified asthma prevalence in cleaners around 1.5–2.0 times those of reference populations. There are around 700,000 cleaners in the UK, asthma prevalence is around 8%, and that suggests a high burden of work-related disease. However, a clinical diagnosis of occupational asthma in cleaners is established relatively rarely. We have investigated the hypothesis that this discrepancy occurs because cleaner's asthma is a form of low dose irritant asthma that is visible to epidemiologists but does not have the typical clinical features of occupational asthma. A questionnaire was sent to 1400 cleaners working in local hospitals and universities. 14% had a previous diagnosis of asthma, and in 32% of these the asthma started after they began work as a cleaner. Investigations for possible occupational asthma comprised paired measurements of airway responsiveness at and away from work ($n = 13$), serial PEF analysed using OASYS-2 ($n = 13$) and a structured clinical history ($n = 10$). 5 subjects had a greater than 3 fold improvement in PD20 away from work, and 2 subjects had OASYS score >2.5 indicating a probable occupational effect. 1 subject had both. The clinical histories were sent to 9 physicians with an interest in occupational asthma who were asked to score them for the likelihood of occupational asthma on a scale 0 to 100% with and without the OASYS scores and the airway responsiveness measurements. Before seeing the investigation results, 7 of the 90 individual scores (9 physicians x 10 subjects) were above 50% indicating that the diagnosis of occupational asthma was thought likely. After seeing the investigation results, 29 of the 90 scores were above 50%. The mean probability score based on the history alone did not exceed 50% for any cleaner but was above 50% for 2 cleaners when the investigations were taken into account. These findings support the view that cleaner's asthma has features that make it difficult to identify from the clinical history.

P133 LONGITUDINAL DECLINE IN FEV1 IN OCCUPATIONAL ASTHMA DUE TO IRRITANTS IS NOT ALTERED BY REMOVAL FROM EXPOSURE

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Introduction Airborne irritants and allergens in the workplace can induce and trigger occupational asthma (OA). OA due to sensitisation is associated with an accelerated rate of decline in FEV₁ (100 mls/yr) compared with healthy controls (25 mls/yr)¹, which improves on removal from exposure. We sought to describe the rate of FEV₁ decline in patients with irritant-induced OA before and after their removal from exposure.

Methods Cases of irritant-induced OA reported between 1991 and 2011 were identified from the SHIELD database (a voluntary reporting scheme for OA) and their demographic characteristics and serial FEV₁ measurements were gathered. Generalised estimating equations with an exchangeable correlation structure were used to calculate an average rate of FEV₁ decline for all patients before and after removal from exposure.

Results A total of 526 FEV₁ readings (179 prior to removal, 347 post removal) were gathered from 52 patients. 30 patients had FEV₁ data both before and after removal; 5 patients had FEV₁ data only before removal, and 17 patients had FEV₁ data

only after removal; demographics were not significantly different between the groups. FEV₁ decline prior to removal of the irritant was 44 ml/year (95% CI: 32–58) and FEV₁ decline after removal was 49 ml/year (95% CI: 36–62). There was no significant difference between the intercepts of the two lines, implying no improvement in FEV₁ after removal from exposure.

Conclusion In this cohort, irritant-induced OA was associated with an accelerated decline in FEV₁, which persisted after removal from the irritant. These results might be attributed to differences in the underlying pathology of sensitisation and irritant-induced OA, differences in patient behaviour, or differences in treatments offered to the two groups.

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P134 SENSITISATION TO CROSS-REACTIVE CARBOHYDRATE DETERMINANTS IN BRITAIN'S BAKERS: THE IMPLICATIONS FOR HEALTH SURVEILLANCE

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Introduction and objectives The diagnosis of baker's asthma as part of health surveillance schemes in some UK supermarkets relies on determining sensitisation to wheat flour and/or alpha amylase. Recently, data have emerged suggesting that serum IgE analysis in bakers may be complicated by the presence of clinically irrelevant specific IgE to cross-reactive carbohydrate determinants (CCDs), which are complex-type Asn (N)-linked glycan structures commonly formed in plants. Potentially this might lead to false positive flour specific IgE assays, which would have an impact on bakers undergoing surveillance. The aim of this study was to identify the prevalence of CCD sensitisation in UK bakers and investigate the impact of CCD specific IgE within a health surveillance setting.

Methods Serum samples from UK bakers attending our occupational asthma clinic ($n = 209$) were analysed for specific IgE to CCD (MUXF³) using ImmunoCAP assay (Phadia). Any positive samples were further tested for specific IgE to grass pollen, and competitive inhibition assays were used to determine cross-reactivity between CCD, flour and grass pollen.

Results Sensitisation rates to CCD in our population of UK bakers were low (7%) despite high sensitisation rates to grass pollen (48%) and flour (60%). Sensitisation to CCD was more prevalent in those sensitised to either flour or grass than in those not sensitised to flour (11.5% vs 0%, $p < 0.001$) or grass (10.9% vs 2.8%, $p = 0.025$). We observed cross reactivity between flour and grass pollen and competitive inhibition assays between CCD and flour or grass pollen revealed cross-reactivity in some but not all sensitised bakers.

Conclusions Our study demonstrated that a minority of bakers were sensitised to CCD and, interestingly, this was associated with being co-sensitised with both flour and grass. It is unlikely that CCDs have major implications for the health surveillance for UK bakeries. In the minority of bakers with CCD specific IgE, there was some suggestion that CCDs may play a role in the cross-reactivity between flour and grass pollen, although in others it was less likely. Within the clinical setting, it may be prudent to measure CCD specific IgE in bakers who are co-sensitised to both flour and grass pollen.