

Missed opportunities to identify occupational asthma in acute secondary care

P. R. Ellis¹ and G. I. Walters²

¹Heart of England NHS Foundation Trust, Birmingham Heartlands Hospital, Birmingham B9 5SS, UK, ²Regional NHS Occupational Lung Disease Service, Heart of England NHS Foundation Trust, Heartlands Hospital, Birmingham B9 5SS, UK.

Correspondence to: P. R. Ellis, Heart of England NHS Foundation Trust, Birmingham Heartlands Hospital, Bordesley Green East, Birmingham B9 5SS, UK. Mobile: 07794751625; e-mail: paul.ellis@doctors.org.uk

Background	Occupational asthma (OA) accounts for one in six cases of new-onset adult asthma. Despite this it remains under-recognized in the UK. Delayed and missed diagnoses of OA lead to poor health outcomes for workers at significant cost to the UK economy. The burden of occupational aetiology on hospital admissions with asthma is not known.
Aims	To measure how frequently medical professionals consider occupational aetiology in patients presenting to secondary care with acute asthma symptoms.
Methods	We reviewed electronic records of working-age patients with asthma symptoms, presenting to three sites at a large West Midlands acute hospital NHS trust. We searched emergency department (ED) and acute medical unit (AMU) admission documents, looking specifically at documentation of employment status, job role and work effect on symptoms. We also examined the effect of using a prompt for enquiry about occupation contained within the clerking pro-forma.
Results	We searched 100 ED and 100 AMU admission documents. Employment status was established in only 20–31% of patients and none were asked about the effect of their work on current asthma symptoms. The use of a clerking pro-forma, including a prompt for occupation, increased documentation to 63% from 10 to 14% where an enhanced pro-forma was not used.
Conclusions	Enquiry into employment status and work effect in working-age patients with asthma symptoms presenting to the ED and the AMU is poor. These may be missed opportunities to identify OA. We propose medical education about high-risk exposures and the use of pro-formas including prompts about occupational exposures.
Key words	Asthma; occupational asthma; secondary care.

Introduction

Incidence of occupational asthma (OA) worldwide is 12–300 cases per million workers per annum, accounting for one in six cases of new-onset adult asthma [1,2]. Persistent exposure to an asthmagen can lead to physiological decline, absenteeism and financial loss, costing the UK £1.1 billion each decade [3]. Favourable health and employment outcomes are achieved with rapid diagnosis and removal from exposure to or avoidance of causative agents [1], but despite this OA remains poorly recognized by health care professionals. This is demonstrated in primary care where 50% of OA goes undiagnosed [4] and doctors and nurses rarely ask new asthmatics about the relationship between symptoms and work [5]. It is not known whether opportunities for early identification of OA are missed in emergency

department (ED) attendees or in those admitted to hospital with acute asthma. British Thoracic Society guidelines recommend all adults with new-onset or reactivated childhood asthma be asked their occupation and whether symptoms are better on days away from work and on holiday. Positive responses to either question are highly sensitive for OA (albeit with low specificity) [6]. In this study, we aimed to measure the frequency of enquiry about employment and work effect on symptoms in a hospital population of working-age adults with acute asthma symptoms.

Methods

We undertook a retrospective audit of electronic patient records of patients from a West Midlands NHS trust,

incorporating three acute hospitals. We assessed admissions for asthma symptoms to ED and acute medical unit (AMU) at each site between 31 March 2016 (ED)/26 March 2015 (AMU) and 16 November 2016. The dates for AMU were extended by 12 months, as there were insufficient attendances in the initial 12 months. We sought patients aged 16–64 coded with pre-existing asthma, work-related asthma and new-onset symptoms (i.e. no formal diagnosis) using all available diagnostic ICD-10 codes pertaining to asthma: ‘asthma’, ‘wheeze (unspecified)’, ‘detergent asthma’, ‘eosinophilic asthma’, ‘lung diseases due to external agents’, ‘miner’s asthma’ and ‘wood asthma’ [7]. From ED and AMU admissions,

we randomly selected patients using a random number generator [8]. For each patient we reviewed clerking documentation of the following information: (i) demographics (age, gender); (ii) history of asthma (pre-existing on treatment, quiescent or childhood); (iii) smoking status; (iv) atopic status; (v) symptom triggers; (vi) employment status and job role; (vii) effect of work on symptoms and (viii) reason for admission (the audit pro-forma, designed and piloted by the authors, is available from the corresponding author on request). We excluded patients seen directly by a respiratory physician as a consult and considered patients admitted to hospital through AMU via ED as part of the AMU group. Before September 2015, a

Table 1. Assessment of occupational aetiology and environmental exposures in working-age patients with asthma symptoms

			ED attendances (<i>n</i> = 100)	Acute medical admissions (<i>n</i> = 100)
Diagnosis	Asthma, <i>n</i>	Probable or definite asthma	96	98
		Possible asthma/episodic wheeze	4	2
	Reason for attendance, <i>n</i>	Pneumonia with exacerbation	1	0
		Allergic exacerbation	5	9
		Infective exacerbation (viral or bacterial bronchitis)	46	56
		Non-infective, non-allergic exacerbation	46	35
		Other ^a	2	0
Exposure assessment	Drug allergy, <i>n</i>	Yes	11	17
		No	55	68
		Not asked	34	15
	Atopy, <i>n</i>	Yes	8	9
		No	1	1
		Not asked	91	90
	Environmental airway triggers (e.g. perfumes/sprays), <i>n</i>	Yes	8	12
		No	3	4
		Not asked	89	84
	Smoking status, <i>n</i>	Never	26	48
		Current	23	23
		Ex-smoker	10	16
		Not asked	41	13
Occupation	Employment, <i>n</i>	Working	10	20
		Unemployed	7	10
		Student	3	1
		Not asked	80	69
	Nature of work, if employed, <i>n</i>	Role specified	5	15
		Work acknowledged but not specified	5	5
Symptom enquiry	Symptoms worse at work, <i>n</i>	Yes	0	0
		No	0	0
		Not Asked	94	88
		Not applicable ^b	6	12
	Symptoms better on days away, <i>n</i>	Yes	0	0
		No	0	0
		Not asked	94	88
		Not applicable ^b	6	12
	Symptoms better on holiday, <i>n</i>	Yes	0	0
		No	0	0
		Not asked	94	88
		Not applicable ^b	6	12

^aRequired prescription of beta-2 agonist.

^bUnemployed, student or not able to work due to disability.

standardized AMU clerking pro-forma included prompts for occupation. Its design was changed from September 2015 and the occupation prompt was removed. The reason for this was unclear. The study was approved as an audit by the hospital trust and we did not, therefore, seek ethical approval.

Results

From 554 ED and 300 AMU admissions, we randomly selected 200 patients (100 each from ED and AMU). All patient clerkings were undertaken by doctors at foundation, core medical or speciality trainee level, plus non-training doctors. AMU admissions (mean age = 38.9; SD = 13.5) were older than ED attendees (mean age = 34.3; SD = 11.4). The proportion of male patients was similar in both groups (AMU = 41%, ED = 42%). Audit results are shown in Table 1. The majority of patients had previously been diagnosed with asthma (96–98%), and most admissions were due to infective or non-infective/non-allergic exacerbations (46% each). Enquiry regarding exposures was variable: drug allergy (66–85%), atopic status (9–10%), airway triggers (11–16%) and smoking status (59–87%). Employment status was established in 20–31% of admissions, and nature of work established in 50% of those cases. No patients were asked about work-relatedness of symptoms. Fifty-six (80%) AMU admission clerkings were documented on a pro-forma and 16 (29%) pro-formas included an occupation prompt. Where the occupation prompt existed, employment status was recorded in 63% of cases, compared with 10% where no prompt existed. In AMU cases where a clerking pro-forma was not used, employment status was documented in 14% of cases.

Discussion

Our findings demonstrate that employment status was established in only one-fifth of ED admissions and less than one-third of AMU admissions by acute secondary care doctors. An occupational prompt in the clerking pro-forma increased enquiry about employment status 6-fold. Occupational inhalational exposures and work-relatedness of symptoms were not routinely considered, and while smoking status enquiry featured in most cases, other environmental exposures were commonly ignored.

This study only provides a snapshot of current practice in one hospital trust. There may be cultural bias towards a particular style of clinical assessment in the ED and AMU, which would depend upon local operating procedures and protocols, as well as the previous learning and experience of medical staff. One might expect workers in metal processing, automotive and aerospace industries to be over-represented in the working-age population of Birmingham, compared with other urban areas

of the UK, though the effect of any employment bias on standards of history taking in secondary care is likely to be minimal [9]. The results are not surprising since similar lack of enquiry has been demonstrated in primary care [5], where patients attend their GP a number of times before specialist referral is made, resulting in significant delay between seeking health care and diagnosis (mean = 4 years) [10]. This may be a cultural phenomenon in individual acute departments, learned behaviour from undergraduate medical education, or may reflect the current dogma of focusing on quick solutions to enable discharge, shorten length of stay and therefore reduce hospital bed pressures.

UK asthma guidelines recommend that health care professionals ask about work-related symptoms and occupational exposure to identify OA [1,6]. In order to reduce OA disease burden and cost through early diagnosis, we endorse an emphasis in undergraduate medical education on occupational factors in chronic disease. We suggest that acute hospital departments use pro-formas including prompts for health care professionals to consider work-relatedness of symptoms and occupational aetiology.

Key points

- All adults with new-onset or reactivated childhood asthma should be asked about the nature of their work and about work-relatedness of symptoms, to identify cases of occupational asthma.
- While other environmental exposures such as smoking and alcohol are reliably sought in the emergency department and acute medical unit, occupational aetiology appears unappreciated in acute hospital care.
- We endorse better undergraduate medical education and using clerking pro-formas with prompts for health care professionals, to help with consideration of occupational cause for symptomatology.

References

1. Nicholson PJ, Cullinan P, Burge PS, Boyle C. *Occupational Asthma: Prevention, Identification and Management: Systematic Review and Recommendations*. British Occupational Health Research Foundation. 2010. <http://www.bohrf.org.uk/downloads/OccupationalAsthmaEvidenceReview-Mar2010.pdf> (30 March 2017, date last accessed).
2. Torén K, Blanc PD. Asthma caused by occupational exposures is common—a systematic analysis of estimates of the population-attributable fraction. *BMC Pulm Med* 2009;**9**:7.
3. Ayres JG, Boyd R, Cowie H, Hurley JF. Costs of occupational asthma in the UK. *Thorax* 2011;**66**:128–133.
4. Walters GI, McGrath EE, Ayres JG. Audit of the recording of occupational asthma in primary care. *Occup Med (Lond)* 2012;**62**:570–573.

5. de Bono J, Hudsmith L. Occupational asthma: a community based study. *Occup Med (Lond)* 1999;**49**:217–219.
6. British Thoracic Society. *British Thoracic Society/SIGN Asthma Guideline 2016*. <https://www.brit-thoracic.org.uk/document-library/clinical-information/asthma/btssign-asthma-guideline-2016> (25 March 2017, date last accessed).
7. World Health Organization. *ICD-10 Version: 2016: X Diseases of the Respiratory System*. <http://apps.who.int/classifications/icd10/browse/2016/en#/X> (25 March 2017, date last accessed).
8. Research Randomizer. *Random Sampling and Random Assessment Made Easy!* <https://www.randomizer.org/> (26 March 2017, date last accessed).
9. Walters GI, Kirkham A, McGrath EE, Moore VC, Robertson AS, Burge PS. Twenty years of SHIELD: decreasing incidence of occupational asthma in the West Midlands, UK? *Occup Environ Med* 2015;**72**:304–310.
10. Fishwick D, Bradshaw L, Davies J *et al*. Are we failing workers with symptoms suggestive of occupational asthma? *Prim Care Respir J* 2007;**16**:304–310.