SHORT REPORT

Audit of the recording of occupational asthma in primary care

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Background
Occupational asthma (OA) remains common; 1 in 10 cases of adult-onset asthma is due to work. Health outcomes are better with early diagnosis, but there is considerable delay, largely due to lack of enquiry about work effect in primary care. National guidelines (2008) recommend asking two screening questions, which together have a high sensitivity in identifying OA.

Aims
To audit how working-age asthmatics are currently screened for OA in a local primary care population.

Methods
An audit of the electronic patient records of working-age asthmatics, from four Birmingham primary care practices was undertaken. Practice-level data (list size, gender, prevalence of asthma and OA and socio-economic status) and patient-level data (gender, age, onset, occupation and work-effect enquiry and lung function) were collected.

Results
The total practice population was 27,295 of which 17,564 (64%) were of working age. The audit sample was 396 of whom 49% were male. The prevalence of asthma in working-age adults was 12% (8–15%) and the prevalence of OA in working-age asthmatics was 0.3% (0–0.8%). Occupation was recorded in only 55/396 (14%) cases with very few (2) documented within the asthma-review template. Occupation was only recorded in 13/55 adult-onset asthmatics in high-risk occupations. Of 396, 9 (2%) had any work-effect enquiry and 4 patients had work-effect enquiry at diagnosis in those with traceable notes (n = 117).

Conclusions
The prevalence of OA was low, suggesting under-diagnosis plus under-reporting in primary care. Occupation and work-effect enquiry is lacking despite guidelines for identifying OA. Existing electronic templates for recording asthma review could be modified to include these elements.

Key words
Occupational asthma; primary health care; work-related symptoms; screening; diagnosis; occupation.

Introduction
Occupational asthma (OA) remains common with 1 in 10 cases of adult-onset asthma in the UK due to exposure at work [1]. Each new case costs £3.5–£4.8 million per disease lifetime, with the greatest financial burden falling equally on the state and patient [2]. Health outcomes from OA are better with early diagnosis and when delay between symptom onset and diagnosis (or avoidance of the causative agent) is reduced [1]. Delay is largely due to lack of work-effect enquiry in primary care [3]; yet most present to their general practitioner (GP) first and half have seen their GP at least five times by the time of specialist referral [4]. UK guidelines suggest that all patients with new onset or reactivated asthma symptoms in adulthood should be asked their occupation and screened about work effect [5]. Two simple questions (‘Are your symptoms better on days away from work, at weekends?’ and ‘Are your symptoms better on holidays?’) have high sensitivity when both questions are asked [6]. We aimed to audit how working-age asthmatics are currently screened for OA, in a primary care population in Birmingham, UK.

Methods
A case-note audit was performed at four West Midlands Primary Care Research Network practices (population =
27 295; 17 564 (64%) of working age). Practice-level data on list size, gender, number of working-age patients (Korner age-bands: 16–64) and number Read-coded with ‘asthma’ and ‘OA’ were gathered by searching the Egton Medical Information Systems practice database. Neighbourhood employment statistics were sought from Census data [7], and practice Index of Multiple Deprivation (IMD) scores [8] were also obtained.

A random sample of 100 working-age adults with a Read-code diagnosis of asthma (age 16–64 years) was taken from each practice. Using individual patients’ electronic records, the following data were collected: (i) demographics (age, gender and coexisting airways disease), (ii) date and age at onset of asthma (adult onset (≥16-year old), prevalent childhood and reactivated childhood), (iii) date of last two asthma reviews (urgent or routine), (iv) occupation, (v) work effect (documented at all, at diagnosis or within last two asthma reviews), (vi) lung function (peak-expiratory flow or spirometry).

Age was compared between samples by single factor analysis of variance, and the proportion of males in each sample was compared with the proportion of males from each practice population, by chi-squared test with Yates’ correction.

Results

Mean practice-list size was 6824 patients (SD ± 3846), of which 64% were of working age and 47% were male (Table 1). Across the sample, the prevalence of asthma in working-age adults was 12% (range 8–15%), and prevalence of OA in working-age asthmatics was 0.3% (range 0–0.8%). All practices were located in the top 36% most deprived neighbourhoods in UK.

There were 396 working-age asthmatics in the sample (Table 2): 96–100 per practice, 49% male and mean age 39 (SD ± 14). There was no difference between sample practices on the basis of age and no significant difference in proportion of males, between each sample and parent practice population. There were no coded cases of OA (one non-coded case of diagnosed OA was identified during data-gathering). Onset of asthma in 59% of patients was during working age (≥16-year old), 95% having new onset rather than reactivated childhood asthma. Adult-onset asthma was most likely between 25–34 years (28% cases) and least likely between 55–65 years (6%). Occupation was recorded in 55/396 cases (14%); of these 2/55 were in the asthma-review template, 17/55 in asthma-review free text and 36 elsewhere in the patient record. Of 55 patients, 13 (24%) were both in high-risk occupations for OA [9] and had onset of asthma in adult life.

In 301/396 (76%) patients, at least two asthma reviews were carried out by nurse or GP (of most recent: 27% urgent, 73% routine). In 9/396 (2%), work effect was recorded, 7/9 at the time when occupation was documented. In all, 117 records had information available since the date of diagnosis, at which point only 4 (3%) had had a work-effect enquiry. In just 6/301 (2%), work effect was enquired about at most recent asthma review, of which three had a positive response for which no demonstrable action was taken. Of 396 patients, 303 (77%) had single peak-expiratory flow measurements and 70 (18%) had spirometry documented since diagnosis. Thirty-nine (10%) had been Read-coded as ‘asthma-resolved’.

Discussion

This audit of general practice records found a prevalence of OA in working-age asthmatics of 0.3% which is much less than the estimated national prevalence of 10%. Occupation was recorded in only 14% of working-age asthmatics and only 2% had any work-effect enquiry.

It is acknowledged that sample size was small, that this was a retrospective study and that it did not adjust for

Table 1. Summary data of patients with asthma and recorded OA by practice

<table>
<thead>
<tr>
<th>Practice</th>
<th>Practice 1</th>
<th>Practice 2</th>
<th>Practice 3</th>
<th>Practice 4</th>
</tr>
</thead>
<tbody>
<tr>
<td>Practice-list size</td>
<td>7142</td>
<td>5581</td>
<td>11 885</td>
<td>2687</td>
</tr>
<tr>
<td>Number of male patients, n (%)</td>
<td>300 (49)</td>
<td>265 (46)</td>
<td>261 (44)</td>
<td>136 (52)</td>
</tr>
<tr>
<td>Number of patients of working age, n (%)</td>
<td>4452 (62)</td>
<td>3767 (68)</td>
<td>7599 (64)</td>
<td>1746 (65)</td>
</tr>
<tr>
<td>Prevalence of asthma a in working-age adults (%)</td>
<td>14</td>
<td>15</td>
<td>8</td>
<td>15</td>
</tr>
<tr>
<td>Prevalence of OA b in working-age asthmatics (%)</td>
<td>0.2</td>
<td>0</td>
<td>0.8</td>
<td>0</td>
</tr>
<tr>
<td>IMD score rank c (% top most deprived in UK)</td>
<td>9</td>
<td>15</td>
<td>3</td>
<td>36</td>
</tr>
<tr>
<td>Proportion of local population in skilled trades d (%)</td>
<td>14</td>
<td>9</td>
<td>12</td>
<td>13</td>
</tr>
<tr>
<td>Proportion of local population in plant/machine operations e (%)</td>
<td>11</td>
<td>9</td>
<td>15</td>
<td>12</td>
</tr>
</tbody>
</table>

a16–64 years of age.
bPatients who have a documented diagnosis of asthma (Read-code H33).
cPatients who have a documented diagnosis of OA.
dIMD score taken for the postcode where practice is located [8].
eAverage for UK is 12%.

fAverage for UK is 8% [7].
Coding errors. While the practices had different list sizes, mean ages were similar between samples. All practices had low socio-economic status among the national distribution; thus a sample where OA is likely to be more prevalent than the norm.

The low prevalence of OA found in the study population, compared with the national estimate of one in 10 cases [1], is most likely to be due to under-diagnosis and under-reporting. The prevalence of asthma in working-age adults (12%) is higher than the national prevalence of active asthma, that is, those currently requiring treatment (6% [9]), which can be explained by a significant portion having quiescent disease; indeed 10% of cases were Read-coded ‘asthma-resolved’. There was sparse documentation of occupation (14%) in working-age asthmatics. All four practices used their own electronic template to record data on symptom severity and control, specific asthma triggers, treatment and peak-expiratory flow. Occupation was rarely documented within the template and did not feature as a specific prompt. Importantly, where there was occupational enquiry, 24% of patients were deemed high risk for OA [10]. Only 2% of working-age asthmatics had received work-effect enquiry since diagnosis: of those with visible records from diagnosis (n = 117), just 3% included work-effect questions. In 77% of patients, peak-expiratory flow measurements had been undertaken (spirometry 18%) as expected, with adherence to the Quality Outcomes Framework [9].

In summary, this study has shown a deficiency of enquiry about occupation and work effect of symptoms among a sample of working-age asthmatics, undertaking review in primary care. The existing asthma-review template could be modified to include occupational enquiry and work-effect questions.

### Key points

- Recorded prevalence of occupational asthma in primary care is low, suggesting under-diagnosis, with some under-reporting also likely.
- There is poor enquiry regarding occupation and work effect of asthma symptoms in primary care, despite national guidelines for identifying occupational asthma.
- Existing electronic templates could be modified to incorporate data entry and prompts for identifying occupational asthma.

### Conflicts of interest

None declared.

### Acknowledgements

We are very grateful to J. Ingram (Primary Care Clinical Research and Trials Unit, University of Birmingham) and practice research nurses from each of four West Midlands Primary Care Research Network practices for their help and advice in this audit.

### References


#### Table 2. Summary data of working-age asthmatics by practice sample

<table>
<thead>
<tr>
<th>Practice</th>
<th>Practice 2</th>
<th>Practice 3</th>
<th>Practice 4</th>
<th>Total</th>
</tr>
</thead>
<tbody>
<tr>
<td>Number of working-age asthmatics in sample</td>
<td>100</td>
<td>96</td>
<td>100</td>
<td>100</td>
</tr>
<tr>
<td>Number of male patients, n (%)</td>
<td>59 (59)</td>
<td>43 (45)</td>
<td>42 (42)</td>
<td>49 (49)</td>
</tr>
<tr>
<td>Mean age (±SD)</td>
<td>36 (15)</td>
<td>40 (14)</td>
<td>41 (12)</td>
<td>37 (15)</td>
</tr>
<tr>
<td>Coexisting chronic obstructive pulmonary disease/bronchiectasis</td>
<td>7/2</td>
<td>2/0</td>
<td>6/0</td>
<td>3/0</td>
</tr>
<tr>
<td>Onset of asthma</td>
<td>Number with adult-onset of asthma*, n (% of sample)</td>
<td>48 (48)</td>
<td>56 (58)</td>
<td>76 (76)</td>
</tr>
<tr>
<td></td>
<td>Number with new onset, rather than reactivated childhood asthma, n (% of adult-onset asthmatics)</td>
<td>44 (92)</td>
<td>53 (95)</td>
<td>74 (97)</td>
</tr>
<tr>
<td>Occupational enquiry</td>
<td>Occupation recorded, n (%)</td>
<td>6 (6)</td>
<td>20 (21)</td>
<td>11 (11)</td>
</tr>
<tr>
<td>Work-effect enquiry</td>
<td>Number in high-risk occupations and with adult-onset asthma</td>
<td>1</td>
<td>4</td>
<td>5</td>
</tr>
<tr>
<td></td>
<td>At diagnosis*, n (%)</td>
<td>3/26 (12)</td>
<td>0/22 (0)</td>
<td>1/47 (2)</td>
</tr>
<tr>
<td></td>
<td>At most recent two asthma reviews*, n (% of those having asthma reviews)</td>
<td>2/72 (3)</td>
<td>3/66 (5)</td>
<td>1/92 (1)</td>
</tr>
</tbody>
</table>

*Four patients from the sample were incorrectly coded as being asthmatic, thus n = 96 rather than 100.

**Age 16 or older.

*Only 117/396 patients had visible records at diagnosis (otherwise (i) diagnosis was in childhood, (ii) patient had registered with practice after diagnosis or (iii) the diagnosis was made before the introduction of electronic patient records).

*Of 396 patients, 301 had undertaken at least two asthma reviews.


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