Work-related respiratory disease

P1 QUALITY OF LIFE RELATED TO COPD AND OCCUPATIONAL EXPOSURES

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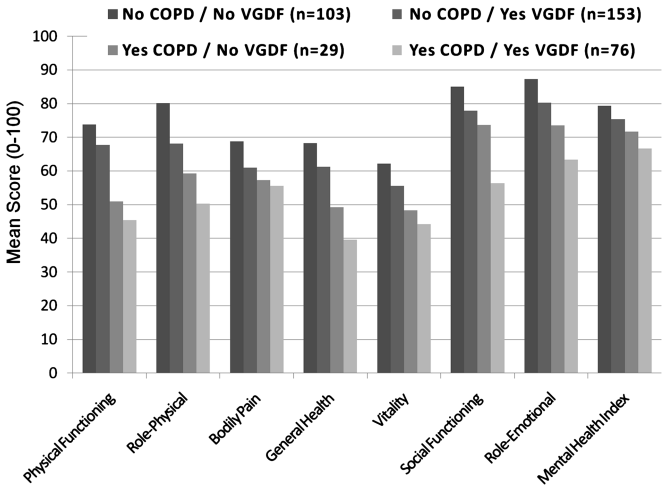
[1]AC Darby, [2]JC Waterhouse, [3]V Stevens, [3]CG Billings, [2]SE Hickman, [2]A Seriki, [4]J Wight, [1]D Fishwick. *[1]Centre for Workplace Health, University of Sheffield, Health and Safety Laboratory, Buxton, UK; [2]University of Sheffield, Sheffield, UK; [3]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK; [4]Sheffield Primary Care Trust, Sheffield, UK*

Introduction COPD is associated with a considerable degree of morbidity and mortality and has been shown to adversely affect quality of life. One of the aims of a large epidemiological study of COPD and occupation in Sheffield was to evaluate quality of life. Having previously presented data from our initial survey using the EQ-5D tool and self-reported COPD[1], we now present data from the follow up phase of the population based study using the more detailed quality of life estimate SF-36v2 and COPD defined by spirometry.

Methods A random population sample of 4000 Sheffield residents aged over 55 years was approached for study in 2007, along with a supplemental sample of 209 people with likely COPD recruited from a hospital physiology department. A detailed questionnaire recorded demographics, respiratory symptoms and diagnoses, smoking and occupational exposures. A proportion were re-visited in 2009–2010 for further spirometry and quality of life measure using the SF-36v2, which consists of 36 questions, divided into 8 domains, scores being converted to a scale from 0 to 100, the higher score indicating better health.

Results 549 people participated in the follow up phase, of whom 361 completed the SF-36v2. Abstract P1 Figure 1 shows mean scores for each of four different categories relating to COPD (defined by GOLD level 1 spirometry) and ever exposure to vapours, gases, dust and fumes (VGDF) in the workplace. In all domains, the group with airways obstruction has lower mean values than those without, and those who also report exposure to VDGF at work have further reductions ($p<0.05$). Of the 103 people in this group who have airways obstruction, those who also self-report a diagnosis of COPD (n=49) have significantly worse ($p<0.05$) quality of life than those who have no self-reported diagnosis.



Abstract P1 Figure 1

Conclusions Those with GOLD 1 or greater COPD have an adverse quality of life as compared to those without airways obstruction, differences in scores being greater for the physical rather than emotional domains. Occupational exposure to VGDF also appears to adversely affect quality of life estimates.

REFERENCE

1. **Darby A,** *et al*. Quality of life estimates in the Sheffield COPD study. *Poster 1094 ERS* 2009.

P2 OUTBREAK CASE DEFINITIONS FOR EXTRINSIC ALLERGIC ALVEOLITIS DUE TO METALWORKING FLUIDS

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[1]CM Burton, [2]PS Burge, [2]AS Robertson, [3]W Robertson, [4]CAC Pickering, [5]DJ Hendrick, [1]CM Barber. *[1]Centre for Workplace Health, HSL, Buxton, UK; [2]Birmingham Chest Clinic, Birmingham, UK; [3]University of Warwick, Coventry, UK; [4]North West Lung Centre, Manchester, UK; [5]Chest Clinic RVI, Newcastle upon tyne, UK*

Introduction In 2003, a large outbreak of occupational lung disease (OLD) occurred in the Powetrain plant in Birmingham, which included 21 workers who met the case definition for extrinsic allergic alveolitis (EAA). The aim of this study was to assess the performance of the case definition used during this and other outbreaks, against best available clinical diagnosis.

Methods All available hospital clinical data (including follow-up) for 37 workers with a documented clinical suspicion of EAA during the outbreak investigation was reviewed by a panel meeting of 5 UK OLD specialists. A definite clinical EAA case was accepted if at least four of the five experts agreed. This opinion was compared with a range of case definitions previously used during UK and US outbreaks.

Results A definite clinical diagnosis of EAA was accepted for 14 of the 37 workers. The performance (level of agreement, sensitivity and specificity) of different EAA case definitions vs the specialist clinical opinion is shown in Abstract P2 Table 1.

Abstract P2 Table 1

Case definition	Cohen kappa	Sensitivity	Specificity
Robertson 2007	0.80	100%	70%
Gupta 2006	0.68	36%	96%
Dangman 2002	0.78	79%	83%
Weiss 2002	0.49	7%	91%
Fox 1999	0.83	93%	78%
Zacharisen 1998	0.44	79%	35%

Discussion The EAA case definition used in the Powertrain outbreak (Robertson 2007) showed substantial agreement with expert clinical opinion, correctly classifying 30/37 workers, without missing any of the definite clinical EAA cases. The Fox and Dangman criteria also performed well, correctly classifying a similar proportion of workers, but missing 1 and 3 of the definite clinical EAA cases respectively.

P3 COPD CAUSATION; AN ASSESSMENT OF AGREEMENT BETWEEN EXPERT CLINICAL RATERS

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[1]AC Darby, [2]R Barraclough, [3]PS Burge, [4]NS Hopkinson, [5]JL Hoyle, [6]RA Lawson, [2]RM Niven, [7]SC Stenton, [8]CJ Warburton, [1]CM Barber, [9]PD Blanc, [1]AD Curran, [1]D Fishwick. *[1]Centre for Workplace Health, University of Sheffield, Health and Safety Laboratory, Buxton, UK; [2]University Hospital of South Manchester, Manchester, UK; [3]Birmingham Heartlands Hospital, Birmingham, UK; [4]NIHR Respiratory Biomedical Research Unit, Royal Brompton Hospital and Imperial College, London, UK; [5]North Manchester General Hospital, Pennine Acute NHS Trust, Manchester, UK; [6]Sheffield Teaching Hospitals NHS Foundation Trust, Sheffield, UK; [7]University of Newcastle upon Tyne, Newcastle upon Tyne, UK; [8]Aintree Chest Centre, Aintree University Hospitals NHS Foundation Trust, Liverpool, UK; [9]Division of Occupational and Environmental Medicine, University of California, San Francisco, USA*

Introduction and Objectives Epidemiological studies consistently find that up to 15% of COPD is attributable to occupational exposures.

Abstract P3 Table 1

Selected case scenarios by attribution mix	Causal attribution by physician case raters		
	Smoking % (median, IQR)	Occupation% (median, IQR)	Other % (median, IQR)
Case 1 (Heavy smoker, heavy occupational exposure – 43 years foundry and scrap metal work, paint fume exposure)	73 (62.5–90)	10 (10–31)	0 (0–10)
Case 2 (Heavy smoker, light occupational exposure – 9 years grain dust exposure	90 (80–96.5)	10 (0–12.5)	0 (0–10)
Case 3 (Medium smoker, medium occupational exposure – 28 years, scrap metal and cotton dust exposure)	70 (60–87.5)	20 (7.5–40)	0 (0–15)
Case 4 (Light smoker, heavy occupational exposure – 45 years as a stonemason)	50 (32.5–75)	40 (15–67.5)	0 (0–15)

Despite growing recognition that such exposures are associated with COPD, very little is known about how clinicians weight such attributions against cigarette smoking causation in individual cases.
Methods In order to assess attribution of causative factors in COPD by clinicians, we used 15 hypothetical cases of COPD, structured to represent a broad range of smoking and occupational exposure histories. Cases were developed a priori into nine categories: combinations of low, medium and high tobacco smoking and low, medium, and high COPD-risk occupational exposures. Twelve general experts in COPD and 12 specifically in occupational lung disease were invited to rate the cause of COPD in each case, attributing a percentage contribution to the harm caused by three categories: (i) smoking, (ii) occupational exposures and (iii) other causes.
Results To date, responses have been received from nine raters (seven occupational and two general). Ratings from a selected spectrum of cases are shown in Abstract P3 Table 1, expressed as median and IQR. Attribution varied with the degree of exposures, but even light smoking (less than 15 pack years) was weighted more heavily than substantial occupational exposure.
Conclusions There was a wide range of estimates relating to causative factors in COPD documented by experienced clinicians. These findings are consistent with the a priori assumption that attributing COPD causation in an individual case is difficult, as a sparse evidence base exists to guide clinicians. Further work is needed to allow translation of epidemiological findings to attribution in individual COPD cases, to better facilitate the screening, identification and management of occupational COPD.

P4 BREATHLESSNESS AND WORK PERFORMANCE IN OLDER ADULTS IN KENT

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J Szram, SJ Schofield, APM Woods, P Cullinan. *Imperial College, London, UK*

Dyspnoea and functional limitation due to airway obstruction may adversely affect work performance, particularly, it might be thought, in those with manual occupations. This is likely to have an impact on policies that seek to keep people employed to an older age. A questionnaire was sent to the 20 693 adults aged 51–60 registered with 33 general practitioners in Kent. Of 6732 (33%) respondents, 5315 (79%) were in full or part time paid work; of these, 26% declared breathlessness, a proportion significantly lower than of those not in current employment (43%, p<0.001). Across four categories of increasing breathlessness (modified MRC (mMRC) scale 0–3) was associated with higher levels of self-reported poor work performance, a trend more marked in men (5.0%, 17.4%, 28.6% and 42.9%). General health-related and respiratory-specific work disability shared similar relationships with increasing dyspnoea. Breathless individuals also took more extended sickness absence and were more likely to indicate that they would retire due to ill health (3.2%, 7.8%, 9.9% and 25.0% for mMRC0-3 respectively). Regression analysis confirmed the relationship between breathlessness and work performance in both sexes and indicated that it was independent of age, employment status, physical job demands and a number of psychological traits (Abstract P4 Table 1). Significant modification was observed (p=0.04) when including in the model the interaction term between breathlessness and occupational group in men. Stratum specific OR for occupational group were examined; breathlessness had the largest effect on work performance in managerial, professional and technical occupations rather than those in the more physically demanding plant,

Abstract P4 Table 1 Logistic regression of relationship between breathlessness (graded on the mMRC scale: 0=none, 1=mild, 2=moderate, 3=severe) and poor self-rated work performance, stratified by sex. Stratum-specific OR for occupational group are also presented

	Men			Women		
	OR	95% CI	p	OR	95% CI	p
Unadjusted						
mMRC 0	1.0			1.0		
mMRC 1	4.1	2.9 to 5.9	<0.01	2.3	1.5 to 3.6	<0.01
mMRC 2	7.8	4.6 to 13.3		6.0	3.6 to 9.7	
mMRC 3	13.6	7.8 to 23.5		8.5	4.8 to 15.3	
Adjusted						
mMRC 0	1.0			1.0		
mMRC 1	4.1	2.7 to 6.1	<0.01	2.0	1.3 to 3.2	<0.01
mMRC 2	7.5	4.1 to 13.6		4.9	2.8 to 8.4	
mMRC 3	8.5	4.5 to 15.9		7.1	3.7 to 13.9	
Age						
Employment	1.1	1.0 to 1.1	0.08	1.0	0.9 to 1.1	0.96
full time	1.0			1.0		
part time	1.5	0.9 to 2.5	0.13	1.1	0.81 to 1.7	0.50
General control (low)	1.6	1.1 to 2.3	0.02	1.1	0.7 to 1.7	0.58
Optimism (low)	1.5	1.1 to 2.2	0.02	1.5	1.0 to 2.3	0.03
Coping ability (low)	1.6	1.1 to 2.3	0.02	2.2	1.5 to 3.3	<0.01
Work control (low)	3.2	2.3 to 4.6	<0.01	3.1	2.0 to 4.6	<0.01
Physical strenuousness (job)						
Low	1.0			1.0		
Average	2.4	1.5 to 3.7		2.1	1.3 to 3.4	
High	2.8	1.8 to 4.5	< 0.01	2.5	1.4 to 4.2	<0.01
Major occupational group (UK SOC 2000)						
1–3	1.0			1.0		
4–5	1.1	0.7 to 1.7	0.78	0.6	0.3 to 1.0	0.08
6–9	1.0	0.6 to 1.5		0.9	0.6 to 1.4	
Stratum-specific odds rations for occupational group						
Group 1–3						
mMRC 0	1.0			1.0		
mMRC 1	5.4	2.6 to 11.0	< 0.01	3.4	1.6 to 7.5	<0.01
mMRC 2	12.7	4.9 to 32.7		11.5	4.5 to 29.6	
mMRC 3	39.6	11.2 to 140.6		17.6	5.1 to 60.4	
Group 4–5						
mMRC 0	1.0			1.0		
mMRC 1	4.0	2.0 to 7.7	<0.01	1.69	0.6 to 4.6	
mMRC 2	7.4	2.5 to 21.8		1.27	0.3 to 6.4	
mMRC 3	2.6	0.8 to 9.2		*		
Group 6–9						
mMRC 0	1.0			1.0		
mMRC 1	3.3	1.6 to 7.0	<0.01	1.5	0.8 to 3.0	<0.01
mMRC 2	4.9	1.4 to 16.6		4.5	2.0 to 10.3	
mMRC 3	9.7	3.6 to 26.1		7.8	3.3 to 18.3	

*mMRC 3 predicted failure perfectly and therefore is not presented UK SOC 2000 = Standard Occupational Classification.