

# Poor long-term outcome of work-related asthma

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## Introduction

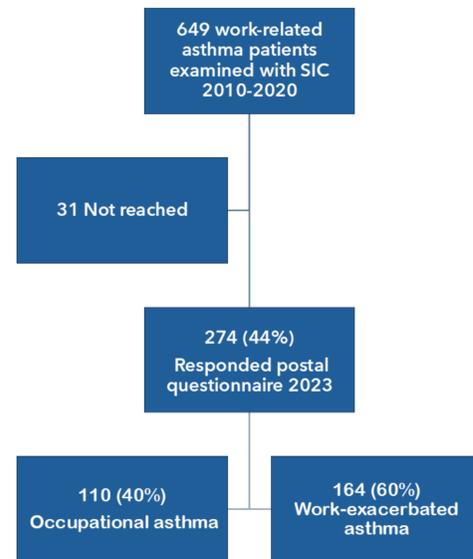
Work-related asthma (WRA) refers to both occupational asthma (OA), which is caused by a factor in the workplace, and work-exacerbated asthma (WEA), in which asthma is worsened by a factor in the workplace.

There are only a few long-term follow-up studies of WRA patients. Our aim was to analyse the factors associated with poor long-term outcomes among them.

## Methods

In 2023, we sent a postal questionnaire to 649 patients who had undergone a specific inhalation challenge test (SIC) at the Finnish Institute of Occupational Health between 2010 and 2020, and who had a verified diagnosis of asthma. The follow-up questionnaire evaluated their asthma outcome, comorbidities, and work history after the SIC. Patients with a positive SIC were classified as having OA, and those with a negative SIC were classified as having WEA. (1) Uncontrolled asthma was defined as an Asthma Control Test score of <20 and/or ≥2 asthma exacerbations or ≥1 hospital stay due to asthma within 1 year. (2) Severe asthma was defined as uncontrolled asthma despite GINA step 4-5 asthma medication.

Figure 1. Study design and patient selection



## References

(1) Vandenplas O, et al. Specific inhalation challenge in the diagnosis of occupational asthma: consensus statement. *ERJ* 2014;43:1573-1587

(2) Global strategy for asthma management and prevention (GINA), the 2024 update

# Finnish Institute of Occupational Health

## Severe asthma is commonly associated with significant functional impairments among patients with work-related asthma

## Conclusions

Severe asthma is a common finding in work-related asthma. Older age and poor asthma outcomes at diagnosis predict severe asthma during follow-up. In the long-term, severe asthma is associated with additional adverse events in these patients. Contributing factors should be considered when treating patients with work-related asthma.

## Results

Table 1. Characteristics of follow-up questionnaire respondents

Characteristics	OA n=110	WEA n=164	P-value
Suspected causative agent			<0.001
• LMW	48 (44%)	122 (74%)	
• HMW	62 (56%)	42 (26%)	
Age at SIC, y	45.5	45	0.489
Median (IQR)	(33-53)	(36.5-54.5)	
Follow-up time, y	9.3	9.0	0.442
Median (IQR)	(6.6-11.8)	(5.0-11.5)	
BMI, kg/m <sup>2</sup>	27.2	27.3	0.930
Median (IQR)	(24.2-30.8)	(24.6-30.9)	
Current smoker	15 (14%)	20 (12%)	0.716
Female	63 (57%)	86 (52%)	0.459
In working life within 1 year	70 (64%)	109 (67%)	0.698
Current exposure to suspected causative agent at work	8/70 (11%)	40/109 (37%)	<0.001
Unemployed after SIC	48/105 (46%)	109 (67%)	0.006
Severe asthma	40 (36%)	47 (29%)	0.188

Table 2. The odds ratio for poor outcomes in severe asthma at follow-up

Variable	Severe asthma at follow-up (n=87) vs Other respondents (n=187)	OR* (95% CI)
Predictive factors at SIC		
• Age of >37.5 <sup>^</sup>	39% vs 15%	3.75 (1.78-7.91)
• Uncontrolled asthma	62% vs 46%	2.22 (1.20-4.14)
• Severe asthma	36% vs 9%	6.87 (3.00-15.74)
Factors at follow-up		
• Difficulties walking 2 km	46% vs 20%	2.67 (1.41-5.04)
• Comorbid diseases ≥2	77% vs 52%	2.70 (1.45-5.05)
• Anxiety symptoms	33% vs 19%	2.65 (1.39-5.03)
• Depressive symptoms	49% vs 27%	2.93 (1.62-5.28)
• Work-related rhinitis**	51% vs 31%	2.40 (1.15-5.00)
• Good work ability**	31% vs 72%	0.21 (0.09-0.48)
• Lower income than at SIC	45% vs 22%	2.96 (1.62-5.43)

\*Variables were adjusted for the type of agent, follow-up time, BMI, current smoking, sex, current exposure to suspected causative agent at work, and age at SIC (apart from <sup>^</sup>).

\*\*Only those employed within 1 year were included in these analyses (n=70 and n=109, respectively). Work ability was self-assessed by the respondents using the Work Ability Index.

## Abbreviations

CI, confidence interval; HMW, high-molecular-weight agent; IQR, interquartile range; LMW, low-molecular-weight agent; OA, occupational asthma; OR, odds ratio; SIC, specific inhalation challenge; WEA, work-exacerbated asthma

