

^bDivision of Pulmonary Medicine and Allergy, Department of Internal Medicine, Hanyang University College of Medicine, Hanyang Medical Center, Seoul, Republic of Korea

^cDivision of Respiratory and Critical Care Medicine, Department of Internal Medicine, Korea University Guro Hospital, Korea University Medical School, Seoul, Republic of Korea.

*These authors contributed equally to this work as co-first authors.

This research was supported by the Korea National Institute of Health Research Project (project no. 2022-ER1205-00).

Conflicts of interest: The authors declare that they have no relevant conflicts of interest. Received for publication November 25, 2023; revised November 30, 2023; accepted for publication December 1, 2023.

Corresponding author: Ji-Yong Moon, MD, PhD, Department of Internal Medicine, Hanyang University College of Medicine, Hanyang University Guri Hospital, 153 Gyeongchun-ro, Guri 11923, Republic of Korea. E-mail: respiy@gmail.com.

REFERENCES

1. Suarathana E, Le Moual N, Lemièrre C, Bousquet J, Pierre S, Pinto BS, et al. Work-related asthma and its impact on quality of life and work productivity. *J Allergy Clin Immunol Pract* 2024;12:372-82.
2. Heffler E, Crimi C, Mancuso S, Campisi R, Puggioni F, Brussino L, et al. Misdiagnosis of asthma and COPD and underuse of spirometry in primary care unselected patients. *Respir Med* 2018;142:48-52.
3. Paulin LM, Diette GB, Blanc PD, Putcha N, Eisner MD, Kanner RE, et al. Occupational exposures are associated with worse morbidity in patients with chronic obstructive pulmonary disease. *Am J Respir Crit Care Med* 2015;191:557-65.
4. Kim JL, Henneberger PK, Lohman S, Olin AC, Dahlman-Höglund A, Andersson E, et al. Impact of occupational exposures on exacerbation of asthma: a population-based asthma cohort study. *BMC Pulm Med* 2016;16:148.
5. Romero-Mesones C, Cruz MJ, Alóbid I, Barroso B, Arismendi E, Barranco P, et al. Disposition of work-related asthma in a Spanish asthma cohort: comparison of asthma severity between employed and retired workers. *J Allergy Clin Immunol Pract* 2023;11:3407-13.

<https://doi.org/10.1016/j.jaip.2023.12.044>

Reply to “Both quality of life and exacerbation are important outcomes of work-related asthma”



To the Editor:

We greatly appreciated the comments and suggestions raised by Jang et al¹ in this issue of *The Journal of Allergy and Clinical Immunology In Practice* about our survey of the impact of work-related asthma (WRA).²

We agree that there is a need to further characterize the determinants of asthma exacerbations, a key component of asthma control, and their impact on the burden of WRA. In our survey, we did not use the World Health Organization consensus definition of severe asthma exacerbations (requiring oral systemic corticosteroids for more than 3 days)³ because our study was initiated before its publication.

Our survey and findings were based on validated questionnaires that may have led to asthma under- or overdiagnosis. However, asthma is a heterogeneous inflammatory disease of

the airways, and a simple pulmonary function test is unlikely to have substantially improved the accuracy of asthma identification. A more accurate diagnosis of asthma would require the documentation of variable airflow obstruction or bronchial hyperresponsiveness and assessment of inflammatory biomarkers.⁴

Jang et al seem to suggest that “asthma in some participants would not be related to work” because: (1) “WRA needs exposure in a specific work environment that has worksite irritants” and (2) 50% of the subjects were employed in industrial sectors (ie, business activities, education, and health and social care) where “a causative irritant would be difficult to specify.” First, WRA is a broad term that refers to asthma that is induced (occupational asthma [OA]) or exacerbated (work-exacerbated asthma [WEA]) by inhalation exposures in the workplace according to the American College of Chest Physicians Consensus Statement.⁵ This widely acknowledged definition does not imply “exposure in a specific work environment that has worksite irritants” because WRA encompasses OA caused by both sensitizing agents (sensitizer-induced OA) and irritants (irritant-induced OA). Second, an American Thoracic Society Statement on WEA concluded that “a wide variety of conditions at work can exacerbate asthma symptoms, including irritant chemicals, dusts, second-hand smoke, common allergens that may be present at work, and other ‘exposures’ such as emotional stress, worksite temperature, and physical exertion.”⁶

Our questionnaire collected information on the following workplace exposures: “vapors/gases/dusts/fumes,” “respiratory allergens,” smoking, cleaning materials, and disinfecting products, along with the frequency of exposure (daily, once a month, once a week, and never). In addition, workplace exposures were assessed by linking the International Standard Classification of Occupations (ISCO)-88 occupational codes with the Asthma-specific Job Exposure Matrix that assigns, for every job code, 3 grades of exposure (none, low, and high) to 30 sensitizers and irritants.⁷ The workers with WRA in our survey were significantly more exposed to high-, low-, and mixed-molecular-weight agents, irritants, microbial agents, mites, highly reactive chemicals, and/or biocide than those without WRA. Workers with multiple exposures had a 5.6-fold higher probability of having WRA (odds ratio: 5.63; 95% confidence interval: 2.69-11.79; $P < .001$) (Table I).

To conclude, whatever the accuracy of asthma diagnosis in our survey, the findings indicate that reporting 2 or more WRA symptoms was associated with an incremental impact on quality of life and work productivity.

Eva Suarathana, MD, MSc, PhD^a

Nicole Le Moual, PhD^b

Paul K. Henneberger, MPH, ScD^c

TABLE I. Distribution of workplace exposure characteristics and their associations with work-related asthma (WRA)

Characteristic	Asthma category		Total (N = 203)	OR (95% CI)	P value
	Non-WRA (n = 118)	WRA (n = 85*)			
Exposures, n (%)					
None	49 (42)	12 (14)	61 (30)	Reference	–
Single exposure	24 (20)	11 (12)	35 (17)	1.87 (0.72; 4.85)	.197
Multiple exposures	45 (38)	62 (73)	107 (53)	5.63 (2.69; 11.79)	<.001

CI, Confidence interval; OR, odds ratio.

*Information was missing in 5 workers with WRA.

Hormoz Nassiri Kigloo, MD^{a,d}
Olivier Vandenplas, MD, PhD^e

^aResearch Institute of the McGill University Health Center, Montréal, QC, Canada

^bUniversité Paris-Saclay, UVSQ, Univ. Paris-Sud, Inserm, Equipe d'Epidémiologie Respiratoire Intégrative, CESP, Villejuif, France

^cRespiratory Health Division, National Institute for Occupational Safety and Health, Morgantown, WV

^dDépartement de médecine sociale et préventive, Faculté de médecine, Université Laval, Québec City, QC, Canada

^eDepartment of Chest Medicine, Centre Hospitalier Universitaire UCL Namur, Université Catholique de Louvain, Yvoir, Belgium.

This work was funded by a grant from the Fonds Scientifique, Centre de Service Entreprises (CESI), Belgium.

Conflicts of interest: The authors declare that they have no relevant conflicts of interest. Received for publication December 22, 2023; accepted for publication December 26, 2023.

Corresponding author: Eva Suarthana, MD, MSc, PhD, McGill University Health Center, Royal Victoria Hospital—Glen Site, 1001 Decarie Blvd, Room D05.2543, Montreal, QC H4A 3J1, Canada. E-mail: eva.suarthana@mcgill.ca.

REFERENCES

1. Jang JG, Lee H, Min KH, Kim SH, Yoon HJ, Moon JY. Both quality of life and exacerbation are important outcomes of work-related asthma. *J Allergy Clin Immunol Pract* 2024;12:803-4.
2. Suarthana E, Le Moual N, Lemiere C, Bousquet J, Pierre S, Pinto BS, et al. Work-related asthma and its impact on quality of life and work productivity. *J Allergy Clin Immunol Pract* 2024;12:372-82.
3. Bousquet J, Mantzouranis E, Cruz AA, Ait-Khaled N, Baena-Cagnani CE, Bleecker ER, et al. Uniform definition of asthma severity, control, and exacerbations: document presented for the World Health Organization Consultation on Severe Asthma. *J Allergy Clin Immunol* 2010;126:926-38.
4. Boulet LP, Boulay ME, Cote A, FitzGerald JM, Bergeron C, Lemiere C, et al. Airway inflammation and hyperresponsiveness in subjects with respiratory symptoms and normal spirometry. *Eur Respir J* 2023;61:2201194.
5. Tarlo S, Balmes J, Balkissoon R, Beach J, Beckett W, Bernstein D, et al. Diagnosis and management of work-related asthma: American College of Chest Physicians Consensus Statement. *Chest* 2008;134(Suppl):1S-41S.
6. Henneberger PK, Redlich CA, Callahan DB, Harber P, Lemiere C, Martin J, et al. An official American Thoracic Society Statement: work-exacerbated asthma. *Am J Respir Crit Care Med* 2011;184:368-78.
7. Le Moual N, Zock JP, Dumas O, Lytras T, Andersson E, Lillienberg L, et al. Update of an occupational asthma-specific job exposure matrix to assess exposure to 30 specific agents. *Occup Environ Med* 2018;75:507-14.

<https://doi.org/10.1016/j.jaip.2023.12.045>

Challenging dated conceptions to advocate for evidence-informed care in multiple chemical sensitivity



To the Editor:

The article by Binkley¹ titled “Multiple chemical sensitivity/idiopathic environmental intolerance: A practical approach to diagnosis and management” failed to include up-to-date research regarding sensitization of chemosensitive receptors such as transient receptor potential channels (TRPV1 and TRPA1), which play a role in odor perception and airway irritation, as well as neuroimmune processes.² Sensitization of these receptors has been consistently observed in studies involving patients who meet the criteria for multiple chemical sensitivity (MCS).² Imaging studies using agonists of these receptors show differences in pa-

tients with MCS compared with controls in brain areas expressing these receptors.²

Although Binkley is correct to recommend a thorough inquiry into the symptoms, triggers, measures taken to avoid those triggers, and psychosocial impact, taking an environmental exposure history should also have been recommended. Patients report that creating living and working environments with reduced exposures to trigger chemicals is the most effective form of MCS management.³ In support is a recent pilot study showing a significant reduction in symptom severity associated with reduced chemical exposures in the home, including the use of fragrance-free cleaning practices.⁴

Although MCS can be associated with psychiatric conditions,⁵ it is crucial to distinguish between association and causation. Patients can develop mental health symptoms after physical symptoms emerge⁶ likely due to the psychosocial repercussions of having MCS. These individuals face ongoing challenges as they endeavor to adapt and function in a society characterized by ubiquitous chemical exposures. This situation significantly affects their daily lives, including lifestyle, relationships, and work. It can lead to significant isolation, limited access to health care, housing, transportation, and employment, with reduced income and sometimes disability.⁷

We concur with Binkley that research on mental health care effectiveness in MCS is limited, with only a few case reports showing improvement in the past 30 years and no clinical trials.² It is worth highlighting that although patients find psychotherapy helpful for coping, it is not curative, and psychotherapeutic medications are more likely to be poorly tolerated.³ Although mindfulness-based cognitive therapy has shown promise in improving emotional and cognitive perceptions related to illness, it does not result in significant alteration of overall illness status.²

MCS is a complex biological condition that can present with symptoms consistent with irritant-induced asthma, migraine, and mast cell overactivity and likely shares common pathophysiological mechanisms with these conditions.² Referral to a mental health practitioner solely because MCS is suspected¹ is inappropriate. These patients would be better served by making a diagnosis based on consensus criteria and validated tools, and taking a holistic, multidisciplinary approach to management. Health care practitioners should be providing diagnosis, medical support, education, and advocacy for these patients rather than furthering stigmatization.⁷ Psychiatric treatments should be considered only for comorbid psychiatric distress.

In Canada, individuals with MCS are legally safeguarded against discrimination under both federal and provincial human rights commissions, entitling them to accommodation for this medical condition. However, support by the medical community is sometimes lacking, leading to barriers to accessing health care, delayed diagnosis, and potential harm. To address this issue effectively, up-to-date evidence-informed care is crucial to improving patient outcomes.

John Molot, MD, FCFP^a

Farah Tabassum, MD, FCFP^b

Domenica Tambasco, MD, FCFP, MSc^{b,c}