



Exposure to Burn Pit Emissions and Respiratory Diseases?

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In addition to casualties, wars create large quantities of waste. The US military used open pits to burn waste of all types—so-called burn pits—during conflicts in the Middle Eastern and Southwest Asian theaters of operations. After deployment to these theaters, a considerable number of veterans reported symptoms, primarily but not exclusively respiratory, that they attributed to exposure to burn pit emissions. Despite considerable public advocacy for and Congressional interest in better understanding the relationship between exposure to burn pit emissions and adverse health outcomes, very little data are available to support such understanding. In this study, Savitz and colleagues¹ report the results of the first large-scale study of the association between duration of deployment to military bases with open burn pits and diagnosis of major cardiopulmonary outcomes among US Army and Air Force veterans of Operation Enduring Freedom (OEF) and Operation Iraqi Freedom (OIF) between 2001 and 2011.¹ This retrospective observational cohort study used Veterans Health Administration (VHA) medical record data for more than 450 000 OEF and OIF veterans, with a median (IQR) follow-up of 10.9 (9.4-12.7) years. Savitz et al¹ found evidence that prolonged deployment to military bases with open burn pits was associated with significantly increased risk of developing asthma (adjusted odds ratio [aOR], 1.01; 95% CI, 1.01-1.02), chronic obstructive pulmonary disease (COPD) (aOR, 1.04; 95% CI, 1.02-1.07), and hypertension (aOR, 1.02; 95% CI, 1.02-1.03).

Because of concern voiced by OEF and OIF veterans, the VHA commissioned the National Academies of Sciences, Engineering, and Medicine to review the scientific evidence that respiratory health outcomes might be related to exposures to burn pit emissions. The report that followed concluded there was insufficient evidence to determine an association between exposure to burn pit emissions and most respiratory outcomes.² While deployment in OEF and OIF has been associated with a higher rate of respiratory symptoms,³ exposures other than burn pits could account for this association, including diesel and jet exhaust, dust storms, ambient air pollution, and smoking. The potential effects of exposure to burn pit emissions are hard to isolate from exposure to these other airborne hazards. Constrictive bronchiolitis has been reported in veterans who experienced burn pit exposures in case series,⁴ but because of its rarity, this disease is difficult to study. To address veteran concerns, Congress mandated the VHA to establish an Airborne Hazards and Open Burn Pit Registry,⁵ but this registry is of limited value for research because the enrollees are self-selected, the questionnaire is difficult for respondents to complete, and only a small subset of respondents undergo objective evaluation.

A significant obstacle to high-quality epidemiological research into the potential health effects of burn pit emissions is inadequate exposure assessment. The emissions are products of combustion using jet fuel of myriad materials, including plastics, metals, and human waste, that contain multiple toxic agents in both particulate and gaseous form, and there was no ongoing monitoring of exposures to any agent.² Savitz et al¹ were able to improve on previous studies that relied on self-report of burn pit exposures by using recently declassified Department of Defense deployment histories that provide base assignments from which individual-level time on bases where burn pits were in operation could be ascertained. Savitz et al¹ then used VHA health care records to identify clinical diagnoses over the entire period following initial enrollment, minimizing loss to follow up or dependence on self-report. Although the work by Savitz et al¹ provides important new information on the long-term health effects of burn pit exposures, the authors acknowledge several limitations. The most problematic is the lack of data on individual-level exposures because dose determines

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toxicity. Another limitation involves generalizability because Savitz et al¹ were only able to include veterans who obtained health care and had a diagnosis made through the VHA.

So what is a busy clinician to make of the findings of the study by Savitz et al¹ suggesting that prolonged deployment to military bases with open burn pits may increase the risk of developing asthma and COPD? When encountering patients with respiratory concerns who are veterans deployed in the Gulf War, OIF, or OIF, it is incumbent to ask about whether they were deployed to bases where open burn pits were in operation and for how long. If a history of substantial exposure to burn pit emissions is elicited, referral to a VHA facility for an Environmental Health Registry Evaluation may be warranted.⁶ Congress recently passed the Promise to Address Comprehensive Toxics Act⁷ that provides disability compensation for multiple burn pit and other toxic exposure presumptive conditions, including asthma, COPD, constrictive or obliterative bronchiolitis, and several interstitial lung diseases.

ARTICLE INFORMATION

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Conflict of Interest Disclosures: Dr Balmes reported serving on a National Academies of Sciences, Engineering, and Medicine committee for the reassessment of the Department of Veterans Affairs Airborne Hazards and Open Burn Pits Registry, for which Dr Savitz was chair.

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