

Study Finds Nearly One-Fifth of Construction Worker COPD Attributable to Work Exposures

A case-control study of airways obstruction among construction workers

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Overview

While smoking is the major cause of chronic obstructive pulmonary disease (COPD), occupational exposures to vapors, gases, dusts and fumes (VGDF) increase COPD risk. Researchers examined older construction workers participating in a national medical screening program between 1997 and 2013, comparing 834 workers with COPD and 1243 controls. Investigators collected extensive data on work history, identifying each worker's participation in construction tasks associated with VGDF exposure, as well as documenting smoking habits.

Key Findings

- Approximately 18% (95% CI=2–24%) of COPD in this population can be attributed to workplace exposures associated with construction tasks.
- Among construction workers who never smoked, 32% (95% CI=6–42%) of COPD was attributable to the workplace.
- The current regulatory framework, directed at individual exposures and not combined VGDF exposures, is inadequate. A better framework would add a focus on respirable irritants regardless of source. Currently used concepts such as nuisance dusts, inert dusts, or particles not otherwise regulated (PNOR) should be scrapped.
- A simplistic Total Worker Health (TWH) model could conclude that reduction of smoking, if smoking cessation programs were to be effective, could have a significantly greater health impact than preventing occupational exposures to VGDF exposures. However, COPD is a significant health risk even for non-smokers, and the findings above suggest that workplace VGDF exposures account for nearly one-third of COPD incidence among never-smokers. Smoking cessation efforts initiated under the TWH model must not reduce efforts to prevent occupational VGDF exposure.

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See abstract:

<http://bit.ly/1DbRKEa>

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A Case-Control Study of Airways Obstruction Among Construction Workers

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Background While smoking is the major cause of chronic obstructive pulmonary disease (COPD), occupational exposures to vapors, gases, dusts, and fumes (VGDF) increase COPD risk. This case-control study estimated the risk of COPD attributable to occupational exposures among construction workers.

Methods The study population included 834 cases and 1243 controls participating in a national medical screening program for older construction workers between 1997 and 2013. Qualitative exposure indices were developed based on lifetime work and exposure histories.

Results Approximately 18% (95%CI=2–24%) of COPD risk can be attributed to construction-related exposures, which are additive to the risk contributed by smoking. A measure of all VGDF exposures combined was a strong predictor of COPD risk.

Conclusions Construction workers are at increased risk of COPD as a result of broad and complex effects of many exposures acting independently or interactively. Control methods should be implemented to prevent worker exposures, and smoking cessation should be promoted. Am. J. Ind. Med. 58:1083–1097, 2015. © 2015 The Authors. American Journal of Industrial Medicine Published by Wiley Periodicals, Inc.

KEY WORDS: COPD; construction workers; occupational risks; vapors; gasses; dusts; fumes; smoking; attributable risk

INTRODUCTION

Chronic obstructive pulmonary disease (COPD) is a heterogeneous disorder that includes chronic bronchitis and emphysema [Pistolesi, 2009] and more than 13 million people in the U.S. have physician diagnosed COPD [Ford et al., 2013a; NHLBI, 2014]. The prevalence of obstructive impairment determined by spirometry (FEV₁/FVC <0.70) was estimated to be 13.7% during 2007–2010 among adults [Ford et al., 2013b]. COPD ranked as the third leading cause of death in 2010 [Ford et al., 2013a; Johnson et al., 2014]. Currently available treatments for COPD are minimally effective with regard to disease progression, making prevention critically important [Eisner et al., 2010].

The etiology of COPD is complex and the biology of COPD is still poorly understood. Although tobacco smoking is the major risk factor for COPD with an estimated population attributable fraction (PAF) of 80–90% [ATS, 1995a], only 15–20% of smokers develop COPD [Barr et al.,

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