

constrained distributed lag model to estimate the cumulative effect on FEV1/FVC and FEF25–75% of ambient BC concentration during the 7 days before the visit. We also evaluated effect modification by participant characteristics using separated regression models and interaction terms.

Results BC was related to decreased FEF25–75% and FEV1/FVC. A 10 $\mu\text{g}/\text{m}^3$ change in BC cumulative during the 7 days before the visit was associated with decreased FEF25–75% [4.2% change; 95% confidence interval (CI): -6.9 to -1.6] and decreased FEV1/FVC (3.0% change; 95% CI: -3.9 to -2.0), respectively. Correspondingly, we found similar associations with FEF25–75% and FEV1/FVC for a 10 $\mu\text{g}/\text{m}^3$ change in BC that occurred 1 day before the visit (1.5% change and 0.5% change). Associations between BC and FEF25–75% and FEV1/FVC were stronger among traffic enforcers who were male, who were never smokers, or who were obese.

Conclusions Traffic-related BC may decrease FEF25–75% and FEV1/FVC among traffic enforcers who are obese, or non-smoking individuals; a male traffic enforcer increases this effect.

Poster Presentation

Exposure assessment

0416

RELATIONSHIP BETWEEN EXTRACELLULAR IRON AND CIRCULATING INFLAMMATION MARKERS IN PLASMA OF MINNESOTA TACONITE WORKERS

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Background Higher rates of mesothelioma, pneumoconiosis, lung cancer, and heart disease mortality have been reported in Minnesota taconite (iron ore) workers compared to the rest of the state population. Oxidative stress and inflammation are important underlying mechanisms in cancer and cardiovascular disease, and exposure to silica containing dust with a high iron content may play a key role in the observed elevated health risks.

Methods In this study, we compared ICP-MS-measured plasma iron concentrations to levels of circulating inflammatory markers (cytokines and chemokines) in 130 taconite workers using linear regression analysis adjusting for covariates.

Results Plasma iron levels varied substantially, ranging from 49 to 636 $\mu\text{g}/\text{dL}$, with a mean of 107 (± 60) $\mu\text{g}/\text{dL}$. After adjusting for age, body mass index, gender and smoking status, plasma iron levels were positively associated with the levels of chemokines RANTES ($p=0.06$), TARC ($p=0.04$), and MDC ($p=0.02$).

Discussion These findings lend some support to the hypothesis that exposure to iron in taconite dust may lead to elevated levels of extracellular iron both in the lung and in the general circulation, producing reactive oxygen species and catalyzing oxidative stress. Given that TARC and MDC have been prospectively associated with lung cancer risk in other research, there is a need to better understand the relationship between extracellular iron levels and these biomarkers in taconite workers. Further analyses to

assess other metrics of iron exposure from taconite dust components on plasma iron concentrations and measures of oxidative stress are warranted.

Poster Presentation

Intervention studies

0450

PREVENTING AND PROMOTING MUSCULOSKELETAL HEALTH AT THE WORKPLACE THROUGH THE DESIGN AND EVALUATION OF AN INNOVATIVE MULTICOMPONENT INTERVENTION: THE INTEVAL_SPAIN PROJECT

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Objectives Musculoskeletal disorders (MSD) are main cause of work absence, reducing sustainability of working trajectories. The objective of INTEVAL_Spain project is to assess the effectiveness of a multifactorial intervention at the workplace to prevent MSD.

Methods The intervention comprises evidence-based primary (participatory ergonomics-PE), secondary and tertiary prevention (case management-CM), and health promotion targeted to MSD. All components are integrated and require full coordination. A cluster randomized trial with a late intervention control group is being implemented to evaluate its effectiveness. Quantitative and qualitative information is being obtained from databases of participating companies, questionnaires, pre-post learning tests, satisfaction surveys, project records and focus groups.

Results Eight clusters of nurses and aides ($n=473$) employed at two hospitals were selected and randomly distributed into intervention ($n=4$) and control ($n=4$). A prevalence of 80% of back and/or neck pain and 70% of high physical demands at baseline were observed. A champion was recruited, together with 8 managers, 33 referent workers and 3 workers' representatives who volunteered to be clusters leaders. A total of 105 proposals for ergonomic improvements are being managed by operational groups. CM is based on the Scottish EASY model, and five main services are offered, combined with health promotion activities: rehabilitation, MSD health beliefs counseling, targeted cognitive behavioral therapy, Nordic walking, Mediterranean diet, emotional training and mindfulness.

Conclusions The intervention is being implemented with high levels of participation and acceptance. If it proves to be cost-effective, it will provide updated, relevant and innovative evidence for MSD preventive strategies at the workplace.