A CASE-CONTROL STUDY OF MESOTHELIOMA IN MINNESOTA IRON ORE MINERS

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Objectives An excess of mesothelioma has been found in iron ore miners in northeastern Minnesota. Miners of taconite, the current form of ore mined, face a number of potentially hazardous exposures. The intensive processing of taconite ore combined with the unique and variable geology of the Mesabi Iron Range create the potential for exposure to natural amphibole fibres, cleavage fragments, and respirable dust. Exposure to commercial asbestos is also possible. The extent to which such exposures contribute to disease burden is being investigated. Lifestyle factors, such as smoking, could also contribute to disease burden.

Results We identified 9,012 deaths, of which 2,693 were cancers, including 943 lung cancers, and 30 mesotheliomas. Mortality from all causes was near unity (SMR = 1.02, 95% Confidence Interval (CI): 1.00–1.04). Mortality from lung cancer and mesothelioma were higher than expected; SMR = 1.16 (95% CI: 1.09–1.24) and 2.79 (95% CI: 1.88–3.98) respectively. SMRs were elevated for all heart diseases (SMR = 1.10, 95% CI: 1.06–1.14), hypertension with heart disease (SMR = 1.79, 95% CI: 1.37–2.30) and ischaemic heart disease (SMR = 1.11, 95% CI: 1.07–1.16). A total of 6,189 incident cancers were identified by MCSS including 1016 lung cancers, and 51 mesotheliomas. PCIRs for mesothelioma and lung cancer were 3.02 (95% CI: 2.24, 3.98) and 1.22 (95% CI: 1.15–1.30) respectively. Other proportionally elevated cancers include oral, esophageal, stomach, laryngeal, and bladder cancers.

Conclusions This analysis indicates taconite workers have an increased risk for certain cancers and cardiovascular disease. Exposures from taconite operations include crystalline silica, respirable dust and elongated mineral particles, including non-asbestiform amphiboles and cleavage fragments. Exposure to commercial asbestos is also possible. The extent to which such exposures contribute to disease burden is being investigated. Lifestyle factors, such as smoking, could also contribute to disease burden.

Conclusion These initial findings indicate a potential relationship between mesothelioma and employment in taconite mining and processing. The extent to which these cases are caused by exposure to taconite dust components, including cleavage fragments and non-fibrous amphiboles found in some zones of the Mesabi Range, or commercial asbestos will be explored in future analyses.

Session: 23. Biological agents

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Background and Objectives Helicobacter pylori was discovered in 1984, but its transmission is not yet clear. Direct person-to-person transmission is most likely and could be relevant to occupational transmission particularly in healthcare workers (HCWs) in institutions for elderly people (IEP). Prevalence of H. pylori increases with age, and studies have shown a prevalence up to 85% in people living in IEP.

Methods We compared the occupational risk for H. pylori in HCWs working in IEP (n = 198) to non-exposed controls (n = 250) in a cross-sectional study using serology. We calculated crude and age-adjusted prevalence; in bivariate analysis we compared both groups for a number of established general life-style and occupational risk factors. We applied logistic regression, Poisson regression with robust variance estimator and binomial regression, using established risk factors as covariates.

Results The crude prevalence of seropositivity was 14.6% (95% CI 9.7–19.6) in HCWs en 13.6% (95% CI 9.4–17.8) in controls. Age-standardised prevalence was 14.2% versus 14.9% (difference not significant) respectively. Univariate analysis of seropositivity showed no significant associations with frequency of faecal contact, washing and feeding of elderly persons, contact with vomit, handling nasogastric tubes or washing linen. Using logistic regression, OR was 0.9 (95% CI 0.5–1.6) in HCWs compared to non-exposed controls after adjusting for other risk factors; only age (OR 3.2 -95% CI 1.6–6.3) and travel to developing countries (OR 2.0 -CI 1.1–3.9) predicted seropositivity to H. pylori in HCWs. In Poisson and log binomial regression, prevalence ratio (PR) was 0.9 (95%CI 0.6–1.5) and 0.9 (95%CI 0.6–1.4); only age and travel contributed significantly to H.pylori seropositivity in both models.

Conclusions In our study, using 3 multivariate methods (logistic regression, Poisson regression and binomial regression), the prevalence of H.pylori seropositivity was not significantly higher in HCWs compared to non-exposed controls. No significant associations between H.pylori seropositive status and occupational exposures were shown.