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ASSOCIATIONS OF PRENATAL MATERNAL SMOKING WITH OFFSPRING HYPERACTIVITY: CAUSAL OR CONFOUNDED? *K M Keyes, G Davey Smith, E Susser (Columbia University, New York, NY)

Introduction: The relation between prenatal tobacco exposure and hyperactivity remains controversial. Reported associations are countered by sibling studies which suggest substantial family-level confounding. Sibling studies, however, also have limitations, e.g., using only mothers who changed their smoking habits. Another strategy is to compare the associations of maternal and paternal smoking. This strategy is enhanced if applied to populations where family-level confounding is less likely. Methods: We used data from a longitudinally-followed subsample the Child Health and Development Study (N = 1,752), a population-based pregnancy cohort ascertained in 1961-1963 in California. Prenatal smoking was common (33.4%), and the associations with family socioeconomic position was minimal. Maternal and paternal smoking patterns were assessed at three time points by mother report. Hyperactivity was assessed at mean age ten based on mother report to a personality inventory. Results: In unadjusted analyses, both maternal ($\beta = 0.16$, 95% C.I. 0.14, 0.18) and paternal ($\beta = 0.13$, 95% C.I. 0.11, 0.15) smoking during the pregnancy period were associated with offspring age 10 hyperactivity. When adjusting for partner smoking patterns, post-pregnancy smoking, and demographics, a stronger effect of maternal smoking ($\beta = 0.27$, 95% C.I. 0.11, 0.41) on offspring hyperactivity than paternal smoking ($\beta = -0.02$, 95% C. I. −0.14, 0.18) was observed. Discussion: Prenatal maternal smoking may indeed be causally related to risk for child hyperactivity. Many potential adverse consequences for offspring of mothers who smoke during pregnancy have been described in the literature, and it is important that robust approaches to inferring causality are applied.

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POSTTRAUMATIC STRESS DISORDER AND DEPRESSION AMONG US MILITARY HEALTH CARE PROFESSIONALS DEPLOYED IN SUPPORT OF THE OPERATIONS IN IRAQ AND AFGHANISTAN. *I Jacobson, J Horton, C LeardMann, M Ryan, E Boyko, T Wells, B Smith, T Smith, for the Millennium Cohort Study Team (Deployment Health Research Department, Naval Health Research Center, San Diego, CA)

Few prospective studies exist that evaluate the mental health status of military health care professionals who have deployed. This study used prospective data from the Millennium Cohort Study with longitudinal analysis techniques to examine whether health care professionals deployed in support of the operations in Iraq and Afghanistan were more likely to screen positive for new-onset PTSD or depression postdeployment than individuals deployed in other occupations. Millennium Cohort participants are surveyed at approximate 3- year intervals and subjects included in this study completed a baseline and at least one follow-up questionnaire, with some subjects completing two follow-up questionnaires. Of 65 108 subjects included who did not screen positive for PTSD or depression at baseline, 9371 (14.4%) reported working as health care professionals for at least one assessment. The incidence rates of positive screens for PTSD or depression were similar for those in health care occupations (4.7% and 4.3%) compared with those in other occupations (4.6% and 3.9%) for the first and second follow-up, respectively. Among military personnel deployed with combat experience, health care professionals compared to service members in other occupations did not have an increased risk for new-onset PTSD or depression over time. Among deployed health care professionals, combat experience was associated with significantly increased the risk (as estimated with an adjusted odds ratio [AOR] = 2.01; 95% confidence interval [CI], 1.06 to 3.83) for new-onset PTSD or depression. These results suggest that being a military health care professional confers neither greater nor lesser risk for PTSD or depression after military deployment. Consistent with previous findings, combat experience, not features specific to health care professions, emerged as the key factor explaining differences in risk.

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ASSOCIATIONS OF SHIFT WORK WITH LEPTIN, INSULIN, AND ADIPONECTIN. *L E Charles, C M Burchfiel, J K Gu, D Fekedulegn, J M Violanti, C C Ma, L C Adjeroh, M E Andrew (CDC/NIOSH, Morgantown, WV)

Shift work disrupts circadian rhythms and may affect metabolic function. Our objective was to investigate cross-sectional associations between shift work and three biomarkers of metabolic function: leptin, insulin, and adiponectin. Participants were 394 police officers from Buffalo, NY. Objective data on shift work were obtained from daily city payroll records over 12 years. Officers were categorized as working day, afternoon, or night shift based on the shift for which they had the highest percentage of hours. Metabolic markers were measured after fasting using standardized techniques. Mean levels of the biomarkers were compared across shifts using ANOVA and ANCOVA. Shift work was significantly associated with insulin among officers with BMI <25 kg/m^2 ($P = 0.015$) and BMI significantly modified this association (interaction $P = 0.018$). Among officers with BMI <25 kg/m^2, those who worked the afternoon shift had higher mean levels of insulin (7.7 uU/mL, 95% confidence interval (CI): 4.9-12.2) than those on day shift (3.5 uU/mL, 95% CI: 2.5-4.8); $P = 0.004$, after adjustment for age, gender, race, sleep duration, workload, smoking, HDL and total cholesterol, triglycerides, and glucose. Mean insulin levels were higher overall across shifts among officers with a BMI ≥25 kg/m^2, though not significantly different. Shift work was not significantly associated with leptin or adiponectin after accounting for gender. Several factors that could affect metabolic function (e.g., irregular or poor eating patterns) have been shown, in previous studies, to be associated with shift work. Our results show that working on the afternoon shift was associated with the higher insulin levels in officers with a BMI <25 kg/m^2.

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AGRICULTURAL EXPOSURES AND STROKE MORTALITY IN THE AGRICULTURAL HEALTH STUDY. *J L Rinsky, J A Hoppin, A Blair, F Kamel, K He, L E Beane Freeman, H Chen (NIEHS/NIH/DHHS, Research Triangle Park, NC)

Although farmers have reduced rates of stroke compared to the general public, certain exposures common to farming could still be associated with stroke. Few studies have examined these occupational risk factors. We analyzed data from 51,603 male pesticide applicators (mostly farmers) enrolled in the Agricultural Health Study (1993-1997). Vital status was obtained through 2008 and stroke mortality was defined by underlying or contributing cause of death on the death certificate (ICD-9 codes 430-438, and ICD-10 codes I60-I69). Information about exposure to crops, pesticides, and animals, as well as potential confounders was self-reported at baseline. Cox proportional hazards models with time from age at enrollment to age at death or censoring were used to estimate hazard ratios (HR) adjusted for state, smoking, and alcohol consumption. Median follow-up time was 13.7 years/participant, during which 390 stroke deaths occurred. Associations between stroke mortality and established risk factors (e.g., smoking, BMI, drinking) were in the expected direction and magnitude. Overall, use of 50 specific pesticides was not associated with stroke mortality. However, stroke mortality was inversely associated with handling hay, grain, or silage (HR: 0.68; 95% confidence interval (CI): 0.53, 0.86). Although, this association may be a result of a healthy worker effect where people engaging in these activities were at lower risk of stroke, the possibility of a protective role of inflammation-related processes associated with grain exposures may also explain this finding. Future studies should focus on stroke incidence to better evaluate these risk factors.