lease in cases of ischemia-reperfusion. Our objective was to demonstrate the effect of carnosine in the lung after vanadium inhalation. Twenty male-CD1 mouse 35±5g were distributed in 4 groups: Inhalation of saline, inhalation of V5O2 (1h/twice a week), Inhalation of saline and carnosine 1mg/kg/day orally, and inhalation of V5O2 and oral carnosine. Mice were sacrificed at week four; lungs were fixed by intracardiac perfusion and processed for histologic evaluation, stained with toluidine blue looking for peribronchial metachromatic mast cells. Five fields at 40X from each mouse were counted. Our results indicated an increase of MC in Vanadium exposed mouse and a decrease when carnosine was administrated. We conclude that carnosine decreases the presence of peribronchial MC possibly by reducing ROS generated by vanadium exposure.

PS 1593 Characterization and Acute Toxicity of Airborne Particles in an Electronic Waste Recycling Facility

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Improper disposal of electronic wastes (e-waste) can lead to the release of toxic chemicals into the environment and increase health risks. Improved recycling processes are evolving to dispose e-waste and recover valuable materials. While these e-waste recycling operations represent vast improvement, little is known about environmental releases, exposures, and potential health impacts at these facilities. In this study, a particulate matter (PM) sampling was conducted at a modern U.S.-based e-waste recycling facility that employs mechanical processing operations. Size-fractionated PM samples were physicochemically analyzed and then given by oropharyngeal aspiration to mice or cultured with lung slices for lung toxicity tests. Chemical analysis showed that the fine and ultrafine PM had higher levels of copper, lead, and zinc (up to ~81 times) than ambient PM collected in the same manner near the recycling facility, with the coarse PM having even greater levels (on an equivalent mass basis) of the metals (up to ~600 times) than the ambient PM. The lung toxicity test results showed that the coarse PM significantly elicited pro-inflammatory responses in the mouse lung at 24 h post-exposure compared to fine and ultrafine PM, and similar toxicity outcomes were observed in the lung slice model. We conclude that exposure to the coarse PM caused substantial inflammation in the mouse lung and the toxicity appeared to be associated with higher concentrations of heavy metals produced by the e-waste recycling operation. Although the exposure levels to total PM as well as specific metal components were well within current Occupational Safety & Health Administration (OSHA) guidelines, the enrichment of these metals compared to levels normally in ambient PM could be of potential health concern. (This abstract does not represent U.S. EPA policy).

PS 1594 PM2.5 Exposure Results in Endothelial Damage and Altered Immune Cell Populations

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Exposure to fine airborne particulate matter (PM2.5) is associated with cardiovascular morbidity and mortality, but the basis for this is not clear. In addition, there are few indices of incipient cardiovascular disease arising from acute or chronic exposures. To identify early biomarkers of exposure we characterized blood cells levels and circulating microparticles in both humans and mice by flow cytometry. We also measured plasma cytokines in samples obtained from human subjects on high and low PM2.5 days. Human blood samples were obtained from a cohort of young, healthy subjects living in the Wasatch (Utah) Valley, during times of low, intermediate, and high PM2.5 levels from January to March of 2013 and 2014. Murine blood samples were obtained from mice exposed (6h/d x 9d) to HEPA-filtered air or concentrated ambient particles (CAPS) generated by a versatile aerosol concentration enrichment system from downtown Louisville, KY air. In human blood samples, we observed a statistically significant, positive association between PM2.5 levels and CD4+ T cells, CD8+ T cells, CD14+ monocytes, and CD16+ neutrophils. Conversely, we observed an inverse association with CD19+ B cells. Like the human samples, we observed a positive association between CAPS levels and circulating CD4+ and CD8+ T cells in mice. Microparticle analysis of human plasma samples revealed increases in endothelial (Annexin V+, CD31+, CD41+) - derived microparticles, while the mouse samples demonstrated a positive association with activated endothelial microparticles (Annexin V+, CD62E+). Multiple cytokines demonstrated a 1.5 fold or greater increase in human plasma on high PM2.5 days. These data suggest that acute exposure to PM2.5 results in endothelial damage and changes in blood cell populations and cytokines. These factors may contribute to the cardiovascular pathology resulting from exposure.

PS 1595 Sepiapterin Supplementation Fails to Ameliorate Diesel Exhaust Particle Exposure-Related Erectile and Coronary Artery Dysfunction in Young Lewis Rats

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The health hazards linked to diesel exhaust particles (DEPs) are of interest because of their nano-scale size, increased respiratory tract deposition, and their complex physio-chemical properties. The exposure to DEP is known to cause a myriad of vasculopathies through increased inflammation and oxidative stress including oxidation of the nitric oxide synthase (NOS) cofactor, tetrahydrobiopterin (BH4) and uncoupling of the NOS complex. The effect of combustion particle exposure on erectile response is under-investigated. We hypothesized that: 1) Instillation of DEPs would induce erectile and coronary vascular dysfunction. 2) The erectile dysfunction would manifest prior to coronary vascular dysfunction in a model of repeated exposure. 3) Increasing bioavailability of BH4 would ameliorate DEP-induced dysfunction. Erectile function in young vehicle control (14 weeks old; n=12) and groups of 1x, 2x, & 3x 125 μg DEP-instilled over 14 days (14 weeks old; n=3) male Lewis rats was assessed *in situ* by measuring the maximum intracavernosal pressure (ICP) and mean arterial pressure (MAP) in response to electrical field stimulation of the cavernosal nerve. DEP exposed groups (1x and 3x) displayed depressed ICP levels at all voltages including a rightward shift in the EV50. Erectile responses after intracavernosal injection of 10 μM sepiapterin, a BH4 precursor were unaffected. *In vitro* coronary artery responses revealed impaired serotonin-dependent vasoconstriction and endothelium-dependent relaxation in all DEP exposed groups that was not relieved by sepiapterin treatment. Based on these data, IT instillation of DEP is associated with both coronary artery and erectile dysfunction and this dysfunction is unrelieved by supplementation with sepiapterin to increase BH4 bioavailability. Supported in part by a Sexual Medicine Society of North America fellowship to D.P.B., East Carolina University and NIH U19 ES 019525.

PS 1596 Mitochondrial microRNA Dysregulation Contributes to Acute Cardiac Dysfunction following Pulmonary Mountaintop Mining Particulate Matter Exposure

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Heart disease is the leading cause of mortality worldwide and is exacerbated in areas surrounding active mountaintop mining operations. Mountaintop mining generates particulate aerosols and thus creates unique air pollution. Mitochondrial dysfunction has been identified following exposure, yet the causative mechanisms are unidentified. MicroRNAs contribute to homeostatic and adaptive mechanisms and dysregulation contributes to the progression of heart disease. The goal of this study was to determine the effect of mountaintop mining particulate matter (PMMTM) on cardiac function and microRNA dysregulation. Adult male Sprague-Dawley rats and FVB mice were exposed to PMMTM collected from areas surrounding active mountaintop mining operations using intratracheal instillation and pharyngeal aspiration, respectively. Twenty-four hours post-exposure, cardiac functional measurements and mitochondrial isolations were performed. Cardiac dysfunction was indicated in both species compared to their sham control by decreased ejection fraction and fractional shortening. Following mitochondrial isolation, RNA was isolated and RT-qPCR was used to assess microRNA levels within the mitochondria. In both species, miR-378 was increased within the mitochondria following PMMTM exposure. Finally, we identified ATP synthase F0 subunit 6 (ATP6) as a potential target of miR-378 regulation. Immunoblotting identified a decrease in ATP6 protein content in the mitochondria of both species. In conclusion, this study provides evidence that PMMTM exposure increases mitochondrial microRNA content that contributes to mitochondrial dysfunction leading to cardiac dysfunction. AHA 13PRE16850066;NIH DP2DK083095;NSF DGE1144676; AHA 14PRE19890020; NIOSH NTRC; NIH R01ES015022

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