Brake Iron Dust Inhalation Intensifying Hypertension (modified)

I read with interest the paper by Vidale et al. (1) My studies of moon walkers, Neil Armstrong and James Irwin, show that these findings can be applied to the hazards of Earth iron dust inhalation. Armstrong returned with extraordinary elevation of his diastolic blood pressure (BP) (160/135), predicting cardiovascular risk. Irwin returned with extraordinary BP after only 3 minutes of exercise with a BP 275/125. (2) Having supervised over 5000 symptom limited, hospital based maximum Bruce treadmill stress tests, I have never seen this. Since there are with space flight, invariable magnesium (Mg) deficiencies, this could be an important contributing factor. Dehydration, with increased catecholamines, vicious cycles with Mg ion deficiencies, would intensify these effects. At least 60% of those living in the United States have a Mg deficiency. A European study, has shown that inhalation of iron dust in 12 year olds could trigger hypertension which may persist to adulthood. (2,3)

Very fine particulate matter can be taken up by the respiratory tract and then disseminated throughout the cardiovascular system; in the presence of a Mg deficiency there would be impairment in the ability of transferrin in binding tightly to iron with in turn, severe oxidative stress, triggering endothelial dysfunction. (2,4)

As to the source of dust, brakes are usually made of cast iron (5), with iron dust, airborne. Apparently, legislation will be required to use some other metal; an alternative might be to effectively seal brakes.

1. Vidale S, Arnaboldi M, Bosio V, Corrado G et al. Short-term air pollution exposure and cardiovascular events: A 10-year study in th urban area of Como, Italy. Int J Cardiol (2017) 248: 389-393.

2.Rowe WJ Neil Armstrong's lunar diastolic hypertension. (Editorial) J. Hypertension Management. (2017) 3: 029e.

3. Zhang Xi, Li Y., Liana C, Del Gabbo, Rosanoff A et al. Effects of magnesium supplementation on blood pressure A meta-analysis of randomized double-blind placebo-controlled trials. Hypertension (2016), 68: 324-333.

4. Parent ME, Zemel MB Magnesium potentiation of iron-transferrin binding. Life Sci (1989) 44: 1007-12.

5. Grigoratos T, Martini G Brake wear particle emissions: a review Environ Sci Pollut Res Int (2015) 22, 2491-2504.

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