ASTHMA IN CHILDREN: EFFECTS OF EXPOSURE TO DIESEL EXHAUST PARTICLES

Diesel exhaust particles are one of the major components of air pollution. These particles are suspended in the air, and are microscopic — less than one-fifth the thickness of a human hair. As we breathe, they are drawn deep into the lungs. Because diesel-powered engines are everywhere, it is almost impossible to avoid them. People that live and work in urban and industrial areas are more likely to be exposed. Combined results from many epidemiological, clinical, and toxicological studies show that diesel exhaust particles are associated with respiratory disorders, as for example severe asthma.

Credit: U.S. Environmental Protection Agency

It is not surprising that children are especially susceptible to the effects of these particles. Results form a recenty study entitled “Diesel exhaust particle induction of IL-17A contributes to severe asthma” and published onine (September 23, 2013) in the *Journal of Allergy and Clinical Immunology,* show that exposure to diesel exhaust particles from traffic pollution leads to increased asthma severity in children.

The study was conducted by researchers at Cincinnati Children’s Hospital Medical Center. and provides insight into the mechanisms responsible for the development of severe asthma in children exposed to high levels of diesel exhaust particles — these mechanisms involve expansion of a type of white blood cells called T helper 17 cells and increased production by these cells of a protein, IL-17A. This protein is known to be associated with several chronic inflammatory diseases, including rheumatoid arthritis, psoriasis and multiple sclerosis.

The researchers studied 235 children and teens with asthma by estimating their diesel exposure attributable to traffic based on where they lived. The researchers also studied mice exposed to diesel particles and dust mites, a common household allergen.

In children with asthma, diesel exposure was associated with more frequent asthma symptoms and increased IL-17A blood levels. In mice, exposure to diesel and dust mites resulted in more severe asthma when compared to dust mite exposure alone.

Neutralization of IL-17A in mice resulted in alleviation of airway inflammation induced by diesel exposure.

Gurjit Khurana Hershey, MD, PhD, director of asthma research at Cincinnati Children's and senior author of the study says that neutralization of IL-17A "may be a useful potential therapeutic strategy to counteract the asthma-promoting effects of traffic-related air pollution, especially in highly exposed, severe allergic asthmatics."

Source: http://theglobalfool.com/asthma-in-children-effects-of-exposure-to-diesel-exhaust-particles/