Chemicals in Flavored E-Cigs Tied To 'Popcorn Lung' Disease

By ACSH Staff — December 9, 2015

The makers of electronic cigarettes believe that their products are safer than combustible tobacco products, as do many of those who use them ("vapers"). However, a study published in Environmental Health Perspectives (EHP) indicates that even non-tobacco, non-combustible products may have some risks. The flavors that help to make vaping attractive (especially as compared to "tobacco" and "menthol" flavors) have been found, once again, to often contain certain chemicals that can damage the lungs.

A group of researchers at the Harvard T.H. Chan School of Public Health examined 51 brands of flavored e-cigarettes and refill liquids, and found that more than 75 percent contained one of these three toxic chemicals diacetyl and/or two related chemicals, acetoin and 2, 3-pentanedione. Their study is entitled "Flavoring Chemicals in E-Cigarettes: Diacetyl, 2,3-Pentanedione, and Acetoin in a Sample of 51 Products, Including Fruit-, Candy-, and Cocktail-Flavored E-Cigarettes."

For a long time, chemicals have been used a flavor enhancers in specific products that are meant to have a buttery taste, for example, microwavable popcorn. Supportive data shows that employees working at popcorn manufacturing plants can be diagnosed with a rare, severe, irreversible lung disease called bronchiolitis obliterans (BO), or simply Popcorn Lung.

After eight former employees of the Gilster-Mary Lee popcorn factory in Missouri that made artificial butter flavor for microwavable popcorn developed BO, the U.S Occupational Safety and Health Administration (OSHA) recommended guidelines for factories where diacetyl was used.

For this specific study, a device was used to simulate inhalation, diacetyl was found in 39 of the 51 products; acetoin and 2, 3-pentanedione were found in 46 and 23 brands, respectively.

These disturbing findings echo those found by noted e-vapor researcher Dr. K. Farsalinos of the Onassis Cardiology Institute in Athens, Greece, last year. He and his colleagues obtained 159 e-liquid samples (all sweet-flavored) from 36 manufactures and 7 countries (6 European and the US), and tested them for the presence of diacetyl and acetyl propionyl. These two chemicals are
ingredients of flavorings and, although safe for use in food, have been associated with the
development of respiratory dysfunction when inhaled. The study found that 74 percent of the
samples contained either diacetyl or 2,3-propanedione. And, An investigative report [7] by a
Milwaukee newspaper found a high frequency of unacknowledged chemical toxicants in e-liquid
via their own laboratory assessments. (Dr. Farsalinos, however, posted this riposte [8] to the EHP
study, in which he points out that the levels of the toxicants found are too low to pose a realistic
health risk, and moreover the levels of such chemicals in cigarette smoke are far higher).

Also currently, there are about 7,000 varieties of flavored e-cigarettes and e-juice (nicotine-
containing liquid used in refillable devices) on the market. The popularity and the use of e-
cigarettes continue to increase, however, there is still lack of supportive data that shows their
potential health effects. The e-cigarettes are not regulated strictly, the U.S. Food and Drug
Administration [9] has issued a proposed rule to include e-cigarettes under its authority to regulate
certain tobacco and nicotine-containing products. Even before those regulations are implemented,
substances such as those found in this study should be removed voluntarily from e-liquids by their
manufacturers.

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