

5th World Conference on

CLIMATE CHANGE AND GLOBAL WARMING

May 23-24, 2018 | New York, USA

Prevalence of Acute Myelogenous Leukemia (AML) in sugar creek residents

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A former oil refinery located immediately to the north of the community operated for about 80 years before closing in the 1980s. The plant has a documented history of benzene containing gasoline leaks dating back to its first years of operation. The gasoline produced at this refinery that was shown to have leaked into water sources and neighborhood contained 0.7–5% benzene. It is estimated that more than six million gallons of unrecovered leachate remains in the ground beneath and surrounding the plant, including the residential community of Sugar Creek. Acute myelogenous leukemia is a well-known result of benzene exposure that has occurred from low exposures from an environmental or workplace exposure. The exposure levels in this study we're derived from interviews of the residents within one mile of the abandoned refinery. All of these subjects lived in the area while the refinery was still operational and described high-level strong gasoline odor. The strong odor threshold for benzene is approximately 150ppm and a conservative gasoline vapor concentration of 150ppm was used whenever one reported smelling the odor of gasoline, which was often. There were at least 3,839 people at risk within one mile of the refinery during the relevant time frames. I received data on 12 individuals, including children, diagnosed with AML who lived within one mile of the old refinery for an average of 25.25 years. One subject's exposure began in 1949 while the average year of onset of exposure was in 1959. The expected rate in a population of 3,839 based on US national prevalence rates per 100,000 populations for all leukemia is 3.11. The rate of sub-type leukemia AML is approximately 27% of the total leukemia. Thus, the relative risk for AML is 0.837 in a normal population, and we would expect to see a rate of less than one in a population the size of Sugar Creek. In this case, there were 12 cases giving a relative risk (RR) of 14.37. A recent study found a similar significant excess of leukemia in a community exposed to a gasoline spill with very low exposures compared to the current case.

Biography

James Dahlgren is a Board-Certified Internist, retired Assistant Professor from UCLA School of Medicine. He has been in Private Practice of Internal Medicine with a sub specialty in Toxicology for over forty years. He has studied and treated thousands of patients with toxic chemical injuries including numerous victims of toxic chemical poisoning including the subjects dramatized in the Erin Brockovich movie. He has been treating and evaluating people with exposures to toxic chemicals since the 1970's.

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