

LAY ABSTRACT

TITLE: Complex Relationships between Perfluorooctanoate, Body Mass Index, Insulin Resistance and Serum Lipids in Young Girls

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Perfluorooctanoate (PFOA) is a chemical that has been used in products like nonstick cookware, grease resistant French fry packaging, and stain resistant furniture and carpet. Industrial releases and use of fire-fighting foam has caused PFOA to be in surface water (such as rivers) and ground water. People drink water or eat food that has PFOA in it. PFOA stays in a person's body for years. It has been linked with poor health, including low body weight in infants and children and high cholesterol. We conducted a study in young girls, age 6-7 years, between 2006 and 2008. The 353 girls were from Greater Cincinnati. At ages 6 to 8-years-old PFOA, insulin, glucose and cholesterol were measured in blood. We calculated their body mass index (BMI) from their height and weight. They were examined to see if they had started puberty. Puberty was either breast development and/or the appearance of pubic hair. The median PFOA (7.7ng/ml) in the girls was two times that found in children in the National Health and Nutrition Examination Survey (2005-2006). We found girls with high PFOA had lower BMIs. We also found girls with high BMI or had started puberty had greater insulin resistance. Insulin resistance occurs when insulin does not move freely from the blood to the cells, where it converts glucose to energy. A chemical exposure that results in lower BMI is negative outcome in children who are already underweight due to chronic

conditions. We do not know the long-term impact of low BMI with childhood PFOA exposure as others have reported that childhood PFOA exposure is associated with higher adult body weight.