Age- and Concentration-Dependent TCDD Elimination Half Life in Seveso Children

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Introduction

Shorter elimination half lives for TCDD and other PCDD/Fs have been reported in human infants [1,2] and in highly exposed adults[3,4] compared with those in the general population, but there are no half life data available for young children and adolescents (i.e., ages 1-18). These data for children are needed to further validate the two age-dependent PCDD/F half life models that have been proposed for estimating childhood body burdens and any associated risks[2,5]. Accordingly, this study examines a database of longitudinal TCDD measurements in the blood lipids of children (ages 0.5 to 18 years) exposed during the 1976 trichlorophenol reactor explosion incident in Seveso, Italy. As many as ten sequential measurements were made on some children. We evaluate the changes in the elimination rate as it is influenced by age, TCDD concentration in the body, chloracne status, and other parameters potentially influencing the elimination half life in children, adolescents and young adults. Our goal was to identify appropriate age versus half life relationships which could be used to estimate childhood body burdens, particularly for ages 1-8 years. These data could then be used when conducting health risk assessments.