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39. Assessment of Patterns of Substance Abuse Among Adolescents and the Associated Severity of Outcome: a 5-Year Retrospective Cohort Study.

SS Rickner, D Cao, KC Kleinschmidt, On Behalf of the Toxicology Investigator's Consortium (Toxic) University of Texas Southwestern, Dallas, TX, USA

Background: Adolescence has long been known as a developmental period during which risk-taking behaviors and substance use emerge. However, little has been published regarding how patterns of use change as adolescents age and how these changes correlate to severity of outcome.

Hypothesis: We hypothesize that the agent classes used illicitly by adolescents change by age and lead to different levels of toxicity among age groups.

Methods: This is a retrospective cohort study of data obtained from the Toxicology Investigator's Consortium (Toxic) database from 2010 to 2015. Patients aged 12–21 years with an identifiable toxicologic exposure to pharmaceutical or non-pharmaceutical agents with the intent to elicit a pleasurable sensation were studied. Cases were assigned based on widely accepted models of adolescent development to cohorts of "Early" (12–14), "Middle" (15–17), and "Late" (18–21). Data were analyzed using ANOVA and Chi-square testing.

Results: Four hundred forty-four cases were studied, including 38 early, 182 middle, and 224 late adolescence patients. These cohorts demonstrated distinct patterns of substance use and the middle cohort was more likely to require a higher level of care (admission to floor or ICU status) than the late cohort when exposed to the following substances: stimulants ($p = 0.002$, Chi-square), anticholinergic/antihistamines ($p = 0.039$, Chi-square), alcohols ($p = 0.019$, Chi-square), and opiates/opioids ($p = 0.044$, Chi-square). Additionally, sedative/hypnotic agents were more likely to be admitted ($p = 0.012$, Chi-square) while psychoactive agents were less likely ($p = 0.004$, Chi-square) than other agents.

Discussion: Level of toxicity is correlated to type of exposure, particularly during middle adolescence, a period where neurodevelopment changes in brain organization and function (especially in the dopamine and serotonin systems) are seen. These neurobiological changes may influence the type and amount of agent used, resulting in higher levels of toxicity. Limitations exist (e.g., exposures not presenting to the ED are not included in this data) and will serve as the basis for further investigation utilizing this and other data sets.

Conclusion: Distinct patterns of substance use exist between adolescent developmental stages and are associated with difference in severity of outcome.