Research Article

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Substance Use Trends in an Adolescent Inpatient Unit in the South Bronx

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Abstract

Objective: *Adolescent's substance use can result in addiction in adulthood, concurrent mental illness, self-destructive behaviors, multiple hospitalizations, and sudden death. The aim of our study was to analyze the substance use trends in an adolescent inpatient unit, and to understand the predisposing and perpetuating factors associated with use of illicit substances in adolescents in the South Bronx.*

Methods: *This is an IRB (Institutional Review Board) approved retrospective chart review study of adolescents aged 12-18 years admitted to an inpatient psychiatric unit in a community hospital in the South Bronx in the years of 2011 and 2015. The sample size (300) was randomly selected to compare 150 subjects from each year.*

Results: *No statistically significant difference was found in the prevalence of illicit substance use in adolescents admitted to inpatient unit in the years of 2011 and 2015. However, there was a positive correlation between urine toxicology results and age. Additionally, the urine toxicology results were correlated positively with the longer length of stay, but not with gender, seclusion/restraint incidence, suicide risk, and 30-day readmission.*

Conclusion: *This study results are in-line with the existing literature which elucidate decreasing prevalence trends of substance use, particularly in adolescents over the decade.*

Keywords: Adolescents, Substance use, Inpatient psychiatric unit.

Introduction

New York is ranked one of the top ten states for illicit drug dependence among teenagers and young adults. Approximately 9.82% of New Yorkers use illicit drugs, higher than the national average of 8.82%. A study conducted by the New York State Department of Health revealed a total of 39,216 unintentional drug poisoning cases in 2012, with 11,773of the cases occurred alone in the borough of Bronx; 12% of total drug related hospitalizations in New York were recorded in those aged 15-24 years [1]. Marijuana is the most commonly used illicit drug among adolescents and its use in adolescents is associated with poorer educational outcome, unemployment and greater welfare dependence [5]. A study by the Child Trends shows that at least 50% of adolescents self reported to have tried an illicit drug at least once by 12th grade; daily marijuana use among grade 10 students increased from 3 to 4% while it rose from 7 to 9% in grade 12students between 2009 and 2011 [11].

Drug use is concerning in adolescents as it may lead to dependence later in life and can intensify the concurrent mental illness by three-fold. Drug use has shown to increase non-suicidal self-injury, suicidality, sudden death, and impulsive behaviors by inhibitory control system [2 - 4]. A recent study showed significant association between individuals (11-24 year-old) having an anxiety disorder and opioid use, post-traumatic stress disorder and cocaine use, and externalization behavior disorder and marijuana use [6]. Other studies explain that adolescents' brains are prone to the adverse effects of illicit drugs because of marked synaptic pruning and increased myelination which may lead to neuropsychological impairment [7]. Neuroimaging studies (in adolescents and adult cannabis users) also revealed some alterations in frontal, medial temporal (amygdala andhippo campus), and cerebellar regions [8-9]. Immunohistochemistry study on rats shows that adolescent cocaine exposure elicits enduring deficits in hippocampal cells' proliferation and survival, and causes long lasting changes in stimulus-reward learning in adults bLR (bread low responder-considered addiction-resilient), as compared to bHR (bread high responder-also considered addiction-prone) [10].

We at Bronx Lebanon conducted a study to analyze the trends in prevalence of substance use. The aim of the study was to better understand the predisposing and perpetuating factors associated with the adolescent population in South Bronx.

Method

This is an IRB-approved performance improvement project to compare trends of substance use in adolescents (12-18-year-old) admitted to an inpatient psychiatric unit at Bronx Lebanon Hospital, Bronx, NY in years 2011 and 2015. Data were acquired from the hospital electronic medical record database and patient charts were review edretrospectively for type of drug, number of admissions, psychiatric history, family history and urine toxicology. Drugs focused in this study include heroin, marijuana, cocaine, opiates and stimulants. Multiple admissions were recorded as individual incidences. The sample size was randomly selected to compare 150 subjects from each year.

Results

Patients admitted in our inpatient unit range from age 6 to 23, with a mean age of 14. These patients were more often found to be males (52%), Hispanics (59%), were more likely to live with their biological parents (79%), had the comorbid mood disorder (42%) and neuro developmental disorder (35%). One-quarter of our patient population reported some type of abuse with a significant number for physical (12%) and sexual (14%) abuse. There was no significant difference between the prevalence of illicit drug use in patients who were admitted to our inpatient unit in 2011 (25%) and 2015 (21%). Most of our patients have their urine drug screen collected (66%) and more than three quarter (81%) of them) were negative for any illicit drugs while a significant number (12%) was positive for cannabis. These adolescents had also a significant family history of mental illness (36%) and substance-related disorders (12%). There was a positive correlation between urine toxicology results and age. Additionally, the urine toxicology results were correlated positively with the longer length of stay (extra 4 days), but not with gender, seclusion/restraint incidence, suicide risk, and 30-day readmission.

Discussion

The study results show no statistically significant difference in prevalence of illicit substance use in the adolescents admitted to Bronx Lebanon Hospital Center's inpatient psychiatric unit between years 2011 and 2015. However, there was a decrease inefficiency of urine specimen for toxicology screen at the time of admission, which was retrospectively found to be secondary to the urine toxicology order not being a part of the Psychiatry Emergency Child/Adolescent Admission Order Set. The decrease prevalence of substance use could be related to increase use of synthetic marijuana, which is not detected during routine urine toxicology results. It is noteworthy to mention that a recent survey results indicate that 69% of high school students do not view smoking marijuana smoking as harmful [12] while K2 – synthetic cannabinoid (SC) has been noted as the second most popular illegal drug used by high school seniors nationally. One of the study published in 2014 echoes increased incidence of K2 use among 12th grade (5.80%) and grade 10 students (5.40%). Only in Bronx area itself, K2 has resulted in 700 recentemergency room visits which is now considered the K2 capital of New York City [13]. The increase use of K2 may be related to easily availability, affordable cost, less harmperception, and inability to detect in conventional urine toxicology tests. The literature also highlights the concern of likelihood of increase use of SC with the legalization of marijuana [15].

National Institute on Drug Abuse data revealed that adolescents with a history of physical, emotional or sexual abuse were more prone to using drugs [16]. A Latent class analysis also suggested that childhood sexual abuse in adolescent girls was associated with higher risk of multiple substance use [17]. Ironically, our study exposed no documented histories of child sexual, physical or emotional abuse were reported in 73% of cases, and no stated family histories of substance use or mental illness in 53% cases. The study results highlighted the importance of identifying and addressing the substantial triggering factors like history of child abuse or family history of any psychiatric illness, alcohol use or other drugs, rather than focusing only on the patient's drug use.

Conclusion

Our study results are in line with the existing literature which emphasizes decreasing prevalence trends of substance use, particularly in adolescent population over the past decade. It also points to the need to understand the complex interplay of multiple factors affecting the incidence of substance use in adolescents. Recent literature relates decreasing prevalence of substance use in adolescents to increased use of synthetic cannabinoids in context of easy availability, lower cost and lower harm perception incomparison to cannabis, which in not detected in routine urine toxicology screening. Moreover, emergence of online social media and its use by the adolescent is also hypothesized to have contributed to the decline in substance use, which has been attributed to stimulation of reward pathways and thereby stipulated to lower the incidence of substance use [18].

Furthermore, our study findings emphasize the need to educate providers about taking comprehensive history including family history, trauma history, in addition to improving electronic medical records order sets to include urine toxicology as part of initial workup. We also want to highlight the healthcare provider's education about importance of screening, harmful effects of substance use, and significant prognostic improvement with early intervention.

Limitations

Retrospective chart reviews.
Limited demographic diversity.
Study sample limited to single center.
Unavailability of test to check for synthetic cannabinoids.

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