Drug dependence and psychotic symptoms: a retrospective study of adolescents who abuse drugs at Al-Amal Hospital in Jeddah, Saudi Arabia

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Abstract

Drug abuse is reported to be on the increase among young persons using illicit substances but little is known about the frequency with which they occur, the symptoms on presentation to health institutions, and the different substances abused. To establish this, we reviewed patient data collected at Al-Amal Hospital in Jeddah Kingdom of Saudi Arabia on young persons who are refered to the hospital for problems related to drug abuse. Data on 69 adolescent drug users were reviewed and analyzed using the Composite International Diagnostic Interview - Substance Abuse Model (CIDI-SAM) to assess dependence on substances including amphetamines, cannabis, cocaine, and opioids. Furthermore, we assessed the adolescents' data on history of delusions and hallucinations in the context of use of, or withdrawal from, these specific substances. Our analysis shows that 10 to 79.6% of users of amphetamines, cannabis, cocaine, and opiates met DSM-III-R dependence criteria for each specific substance. The prevalence of psychotic symptoms associated with each specific substance ranged from users with no diagnosis to users with severe dependence as follows: amphetamines (3-100%), cannabis (7-60.0%), cocaine (5-70.7%), and opiates (4-88%). The risk of psychotic symptoms increased for respondents who abused (OR=7.2) or had mild (OR=8.1), moderate (OR=20.0), or severe dependence (OR=14.0) on cocaine when compared to those who were users with no diagnosis. A similar pattern was evident in cannabis, opiate, and amphetamine users. In conclusion, most adolescent drug users in Saudi Arabia who are dependent on illicit substances experience psychotic symptoms in the context of use of, or withdrawal from, these substances. Psychotic symptoms increased with the severity of the disorders associated with use of all four substances. These findings underscore the importance of developing services to target this population; a population at risk of developing psychotic symptoms.

Introduction

The use and abuse of drugs is a critical issue in most societies and is associated with social and economic consequences. In Saudi Arabia, adolescents constitute a significant percentage (10.7%) of the population. Although many studies have discussed reports of drug abuse among youths in various part of the world,[1-5] the literature has very few such findings from Saudi Arabia. This may be partly explained by the norms and traditions of the country. Our objectives in carrying out this study are, therefore, based on prevailing concerns of the likely unnoticed prevalence of substance use among Saudi adolescents. Globally, substance abuse among adolescents has sparked widespread concerns that millions of adolescents are at increased risk of ill-health, poor academic performances, delinquency, traffic accidents and illicit sexual practices. Approximately 15% of teenagers receiving routine outpatient medical care in a New England primary care network had positive results on a substance abuse screening test.[6,7] Similarly, despite the differences in ages, use of marijuana, cocaine, and hallucinogens was found to be high among high school students in San Francisco East Bay.[8]

Social pressures from peers, family, and societal role models are among the major reasons why adolescents take drugs.[9-11] Predisposition toward rebelliousness, nonconformity, and independence also figure prominently. In addition, a high correlation has been found between parental drug use and abuse and patterns of drug abuse among their children. Some experimentation with mind-altering substances appears to be part of the adolescent *rites of initiation*. With an expanding economy and a population in demographic transition, Saudi youths are vulnerable to most major causes attributable to high prevalence of drug abuse among adolescents. It is, therefore, curious that there is paucity of studies examining the trends and causes of drug abuse among Saudi adolescents.[12]

Early recognition of drug abuse can result in early intervention and treatment.[13-16] Treatment is essential because frequent and heavy use of any drug among adolescents is often a coping mechanism for dealing with personal problems that need to be confronted and resolved if normal development is to occur. The objective of this study, therefore, is to report the prevalence and describe the characteristics of drug abuse among Saudi Arabian adolescents.

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Materials and Methods

Study area

This study was conducted between January and December 2010 in Al-Amal hospital in Jeddah, Saudi Arabia. The hospital has adolescent rehabilitation center to which young people diagnosed with drug abuse are referred for specialist care. With a population of approximately 3,000,000, there are about 600,000 adolescents representing 20% of the total population.

Study population

The study population was made up of all adolescents seen in Al-Amal hospital aged 11-18 years old. Major sources of referral of adolescents to Al-Amal hospital include Ministry of Internal Affairs (MOI) communities.

Ethical consideration

The protocol for this study was approved by the Saudi Arabia Ministry of Health Committee on Research Ethics.

Sampling technique and data collection

All adolescents seen at the adolescent unit of Al-Amal hospital were invited to participate

in the study, regardless of nationality, gender and presenting complaint. Participants were excluded if they or their guardians withheld consent. Also, adolescents who were too ill to respond to the questions were excluded from the study.

Statistical analysis

Data analysis was carried out using SPSS version 17 software. Differences in proportion were evaluated using the χ^2 test. Statistical significance set at P<0.05.

Results

Descriptive statistics

The sample consisted of 69 adolescents of whom 59 were male (90%) with a mean age of 19.3 years (SD=7.2, range 11-21 years). The participants were largely Saudi nationals (89.1%), with the majority being high school graduates (53.3%). Nearly all were non-married (97.6%) and unemployed (98.4%).

Over three-quarters of cocaine users met criteria for cocaine dependence. The comparative figures for dependence on other substances were 63.1% for opiates, 50% for cannabis and 27.8% for amphetamines. Rates of psychotic symptoms were found to increase as the severity of use for each specific substance increased from no diagnosis to severe dependence. Only 6.7% of respondents using cocaine who did not meet criteria for a cocaine diagnosis of abuse or dependence had psychotic symptoms. This prevalence increased to 47.7% in respondents who abused cocaine, 55.2% in respondents with mild dependence on cocaine, 77.7% in respondents with moderate cocaine dependence, and 88.7% in respondents with severe cocaine dependence. A similar pattern regarding the prevalence of psychotic symptoms was found in users of cannabis, opiates, and amphetamines. For instance, 100% and 80% of persons severely dependent on amphetamine and cannabis reported psychotic symptoms. Among all users of substances without a diagnosis of abuse or dependence, cannabis users reported the highest prevalence of psychotic symptoms (12.4%).

Multivariate analyses

On multivariate analysis, we found that participants who abused cocaine were over 12 times more likely than cocaine users without a cocaine use disorder (OR=12.2) to report having psychotic symptoms during use or withdrawal from cocaine. Participants who had mild (OR=17.1), moderate (OR=47.0), or a severe (OR=114.0) dependence on cocaine were also at a greater risk than cocaine users without a cocaine use disorder to report having experienced psychotic symptoms during use or withdrawal from cocaine. Among the covariates, age was found to be related to experiencing psychotic symptoms, with older respondents being less likely to have psychotic symptoms (OR=0.96 CI=0.92,1.0, P=0.047). For the remaining substances, as use went from least to most severe, the risk of psychotic symptoms increased when controlling for age, gender, and employment status. The risk of psychosis was similar for abuse only and mild dependence among cannabis (OR=5.5 *vs* OR=6.5) and opiate users (OR=4.8 *vs* OR=6.0). However, there was a distinction regarding the risk of psychotic symptoms between abuse only and mild dependence among amphetamine users (OR=8.3 *vs* OR=14.8). There was also a marked increase in the risk of psychotic symptoms when dependence became moderate or severe for cannabis (OR=25.1 and OR=26.8, respectively) or opiate users (OR=10.1 and OR=19.7, respectively). Moderate dependence on amphetamines (OR=35.3) was also associated with a much higher risk for psychotic symptoms than abusers or those with mild dependence. All respondents (n=10) with severe amphetamine dependence reported psychotic symptoms, thus an odds ratio of ∞ was estimated due to the small sample.

Discussion

The descriptive findings from this study suggest that the majority of cocaine (79.6%), cannabis (50.7%), and opiate (63.1%) users in our sample had some level of dependence on the substances, while a minority of amphetamine (27.9%) users had developed dependence. Nearly half of the respondents who abuse cocaine (47.7%) or cannabis (44.8%) reported experiencing psychotic symptoms during the use of or withdrawal from those specific substances, while more than half of the respondents who were dependent on cocaine (80%), cannabis (63.5%), amphetamines (56.1%), and opiates (53.1%) reported psychotic symptoms. Furthermore, the rate of psychotic symptoms experienced by users who were dependent on these substances increased as the severity of dependence increased from mild to severe. For example, 55.8% of participants with mild cocaine dependence experienced psychotic symptoms, while this prevalence increased to 77.7% and 88.7% in participants with moderate or severe cocaine dependence. This finding supports a strong dose-response relationship, suggested by Thirthalli and Benegal,[17-19] between the experience of psychotic symptoms and severity of substance use.

Prevalence of isolated psychotic symptoms in the general population has varied from 17.5% in the Netherlands,[20-24] through 25% in New Zealand[25] to 28% in the US.[26] The higher proportions found among abusers and dependent users of the substances in this study are consistent with other reports that more substance users experience psychotic symptoms.[27] Cocaine has a strong dopamine uptake inhibition action[28] and cannabinoid receptors regulate the release of dopamine.[29] This may, therefore, explain the higher proportion of subjects moderately or severely dependent on cocaine or cannabis who are experiencing psychotic symptoms. Amphetamines also act on the brain by stimulating dopamine release.[30] Thus, to the extent that the substances differ in their neurochemical actions on the brain, their differential effects may yield important clues in the causation of psychotic symptoms.

Although psychotic symptoms were found to be common among the users of these substance, the risk of development of psychotic symptoms was found to vary by substance and severity of the substance use. Given the limitations of statistical power and sample size in our study, the risk ratios obtained must be interpreted with caution. After adjusting for age, gender, and employment, our findings suggest that when compared to cocaine users with no diagnosis, an increasing severity of cocaine use from abuse (OR=12.2) to mild dependence (OR=17.1) to moderate dependence (OR=47.0) to severe dependence (OR=114.0) is associated with a greater risk of drug-induced psychotic symptoms during use or withdrawal. A similar pattern, although quantitatively less acute, was found for cannabis, opiates, and amphetamines. Thus, the risk of psychotic symptoms from use or withdrawal with respect to cocaine, cannabis, opiates, and amphetamines users displayed an increase with a progression of abuse to dependence severity for each specific substance.

This supports a strong dose-response relationship between the experience of psychotic symptoms and severity of cocaine, cannabis, opiate, and amphetamine use after adjusting for covariates. Psychotic symptoms in the general population have been associated with risk factors such as a younger age and unemployment.[31] Consistent with prior research, we found that a younger age was related to a greater risk of psychotic symptoms, but only among individuals using cocaine. This study also found that psychotic symptoms are highly prevalent during substance use and/or withdrawal, which is independent of a diagnosed psychotic illness (e.g. schizophrenia, bipolar disorder). However, it is not yet clear whether the presence of psychotic symptoms in individuals without a psychotic disorder contribute to the development of a psychotic illness later in life. Research is, therefore, needed to examine whether a history of psychotic symptoms due to substance use and/or withdrawal affects an

individual's neurobiology, thus increasing the risk of developing a psychotic disorder such as schizophrenia or bipolar disorder.

Our findings also have implications for the pathophysiology of psychotic disorders. For instance, given the increase in risk of psychosis among substance dependent individuals and given that recent studies have demonstrated a link between adolescent substance use and the onset of psychosis in young adulthood,[32] research is needed to study the neurobiology of substance induced psychosis. Such studies would thus promote primary prevention for substance abusers at risk of psychosis. Our findings also confirm the importance of developing services to target out-of-treatment substance users who abuse or who are dependent upon amphetamines, cannabis, cocaine, or opiates, as these persons are at a heightened risk of developing psychotic symptoms.

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