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Twin Study Links Marijuana Abuse, Suicide, And Depression

Research Findings
Vol. 20, No. 2 (August 2005)

By Patrick Zickler, *NIDA NOTES* Staff Writer

Men and women who smoked marijuana before age 17 are 3.5 times as likely to attempt suicide as those who started later. Individuals who are dependent on marijuana have a higher risk than nondependent individuals of experiencing major depressive disorder and suicidal thoughts and behaviors. The researchers who discovered these relationships, in a recent NIDA-funded large-scale epidemiological study, say that although the causes are not clear, their findings demonstrate the importance of considering associated mental health issues in the treatment and prevention of marijuana abuse.

Dr. Michael Lynskey and colleagues at the Washington University School of Medicine in St. Louis, Missouri, gathered data from four groups of same-sex twin pairs (508 identical, 493 fraternal; 518 female, 483 male) enrolled in the Australian Twin Registry. The groups and findings were:

- Among the 277 pairs who were discordant for marijuana dependence (that is, one twin but not the other met the criteria for a diagnosis of marijuana dependence), the dependent twins were 2.9 times as likely as their nondependent co-twins to think about suicide without attempting it, and 2.5 times as likely to make a suicide attempt;
- Among the 311 pairs discordant for early marijuana initiation (just one twin in each pair smoked marijuana before age 17), the early initiators were 3.5 times as likely as their twins to attempt suicide, but no more likely to suffer a major depressive disorder (MDD);
- Among the 156 pairs discordant for diagnosis of MDD before age 17, fraternal but not identical twins with early diagnosis of MDD were 9.5 times as likely to develop marijuana dependence; and
- Among the 257 pairs discordant for having suicidal thoughts before age 17, fraternal but not identical twins with early suicidal thoughts were 5.5 times as likely as their twins to become dependent on marijuana.

<i>Marijuana Abuse and Depressive Disorders In Twin Pairs</i>					
		Major Depressive Disorder		Suicidal Thoughts	Attempted Suicide
		Identical Twins	Fraternal Twins		
Pairs in which one twin	Developed dependence on marijuana	1.16	3.40	2.89	2.53
	First smoked marijuana before age 17	0.86	1.14	1.10	3.49
Marijuana Dependence					
Pairs in which one twin		Identical Twins		Fraternal Twins	
	Had suicidal thoughts before age 17	1.78		5.50	

The study identified relationships between twins' histories of marijuana abuse and mental health problems.

"Overall, the associations between marijuana abuse and depressive disorders suggest a relationship that is contributory but not necessarily causal. Depressive disorders in and of themselves do not cause people to abuse marijuana, and marijuana abuse and dependence do not of themselves cause depression or suicidal behavior," Dr. Lynskey says. "Nevertheless, clinicians treating patients for one disorder should take the other into account at initial assessment and throughout treatment. In the context of treatment, both need to be addressed, because it is not necessarily the case that eliminating one disorder will get rid of the other." The fact that two of the relationships were observed in fraternal but not identical twins suggests that the experiences related in each—marijuana dependence and MDD, and marijuana dependence and suicidal thoughts—may share a common underlying genetic basis, notes Dr. Lynskey.

The associations identified in this study are complex, but point to a simple policy implication, observes Dr. Lynskey. "It is important to see that prevention efforts aimed at one disorder may well have the additional benefit of preventing or reducing the other," he says.

"Drug abuse and depression co-occur at rates much greater than chance and constitute a serious public health concern," says Dr. Naimah Weinberg of NIDA's Division of Epidemiology, Services and Prevention Research. "Understanding how each disorder may contribute to the development and course of the other, and what factors may underlie their co-occurrence, has important implications for prevention and treatment of these disabling conditions. Genetic epidemiologic approaches, such as those applied by Dr. Lynskey and his colleagues, are very powerful tools to help parse out the etiologic relationships between co-occurring disorders."

Source

- Lynskey, M.T., et al. Major depressive disorder, suicidal ideation, and suicide attempt in twins discordant for cannabis dependence and earlyonset cannabis use. *Archives of General Psychiatry* 61(10):1026-1032, 2004. [[Abstract](#)]

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Director's Column
Vol. 20, No. 1 (August 2005)

NIDA Intensifies Focus on Marijuana Abuse

By NIDA Director Nora D. Volkow, M.D.



More than 96 million Americans have smoked marijuana at least once. Marijuana abuse is particularly prevalent among adolescents: Of the more than 2 million people who abuse the drug for the first time every year, two-thirds are between 12 and 17 years of age.

The damaging effects of marijuana fall heavily on adolescents and young adults. Half of all patients admitted to treatment for marijuana abuse are younger than 21. Cognitive impairments caused by marijuana linger a month or more after an individual's last exposure, and the damage is dose dependent—the more a person smoked prior to abstinence, the more marked are the deleterious effects on visual perception, verbal and visual memory, executive function, and manual dexterity, among other mental capabilities (see "[Cognitive Deficits in Marijuana Smokers Persist After Use Stops](#)," NIDA NOTES, Vol. 18, No. 5).

Loss of social and intellectual growth because of these impairments may have a lifelong impact on a person's experience and achievement. As well, compared with teens who never smoke marijuana, a boy or girl who smokes marijuana before age 17 is more than twice as likely to abuse opioids, three times as likely to abuse cocaine or other stimulants, and nearly four times as likely to abuse hallucinogens later in life (see "[Twins Study Links Early Marijuana Use to Increased Risk of Abuse or Dependence](#)," NIDA NOTES, Vol. 18, No. 4).

NIDA is intensifying efforts to fully understand the effects of marijuana exposure from the earliest ages through adolescence and young adulthood. This research (see RFA DA-04-016, "Consequences of Marijuana Use on the Developing Brain," at <http://grants2.nih.gov/grants/guide/rfa-files/RFA-DA-04-016.html>) will provide new insight into the mechanisms by which marijuana affects brain development, a continuum that begins before birth and lasts into early adulthood. We are encouraging research projects that focus on the effect of marijuana during all phases of neurological development, from the neurogenesis and cell differentiation that takes place in the womb to the refinement of connections among cells that continues past adolescence. Our research initiative will produce a fuller understanding of normative brain development. It also will illuminate the importance of family and social contexts in adolescence as well as the differing biological and environmental factors that precede marijuana use or nonuse.

NIDA also is expanding support of research to develop treatments for marijuana abuse (see RFA DA-04-014, "Medications Development for Cannabis-Related Disorder," at <http://grants2.nih.gov/grants/guide/rfa-files/RFA-DA-04-014.html>). There is a clear public health need for interventions to alleviate withdrawal symptoms and to help chronic abusers deal with social and other factors that make stopping marijuana abuse difficult. NIDA's expanded research agenda will encourage development of medications to counter marijuana dependence through animal studies

as well as Phase I and Phase II clinical trials with humans. Some medications will be aimed at marijuana-associated disorders such as intoxication, delirium, psychosis, and anxiety. Other medications may address specific aspects of addiction recovery, such as withdrawal, craving, relapse, and complications such as cognitive impairment, sleep disorders, and depression and other mood disorders that often accompany marijuana abuse.

Successful comprehensive treatment of marijuana-related disorders will require a multidisciplinary approach. Therefore, NIDA's marijuana medications development initiative will encourage investigation of treatments that include behavioral intervention. This broad focus, building on the insights to be gained through increased understanding of marijuana's developmental impact, will help reduce the health costs and alleviate the damage inflicted by widespread abuse of this dangerous drug.

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Marijuana-Related Disorders, but Not Prevalence Of Use, Rise Over Past Decade

Research Findings
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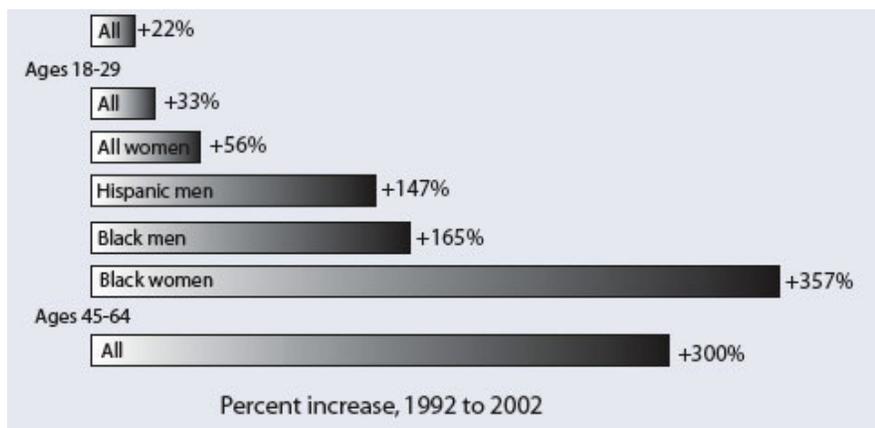
By Patrick Zickler, *NIDA NOTES* Staff Writer

More Americans suffer from marijuana-related disorders now than a decade ago, even though the prevalence of marijuana smoking has not increased. Survey results from 2002, compared with data from a decade earlier, showed that overall, rates of marijuana consumption in adults 18 and older held relatively steady at 4 percent of respondents. However, rates of marijuana-related disorders—discrete conditions defined according to criteria established by the American Psychiatric Association—increased from 1.2 percent to 1.5 percent of respondents, or from 30.2 percent overall to 35.6 percent among marijuana smokers. The increase was particularly sharp among young adult black men and women aged 18-29, among whom marijuana consumption rose only modestly while the prevalence of disorders tripled. Rates of marijuana-related disorders among Hispanic men in the same age span also increased sharply despite only a moderate increase in their rate of marijuana smoking.

"The rise in marijuana-related disorders means that there were approximately 800,000 more adults in the United States with marijuana abuse or dependence in 2002 than a decade earlier," says Dr. Wilson Compton of NIDA's Division of Epidemiology, Services and Prevention Research. "In the 1992 survey, these problems were more common among Whites than among minorities, but in 2002 the differences in rates among the different ethnic groups had narrowed, in large part because of a rate that more than tripled among young African American men and women and more than doubled among young Hispanic men."

Dr. Compton and colleagues at NIDA, and Dr. Bridget Grant and colleagues at the National Institute on Alcohol Abuse and Alcoholism (NIAAA), evaluated data from two large, national epidemiologic surveys—the National Longitudinal Alcohol Epidemiologic Survey (NLAES), conducted in 1991-1992, and the National Epidemiological Survey on Alcohol and Related Conditions (NESARC), conducted in 2001-2002. Both studies define abuse and dependence using criteria that match the diagnostic standards found in the *Diagnostic and Statistical Manual of Mental Disorders, 4th Edition* (DSM-IV); see "[Defining Marijuana-Related Disorders](#)."

Older Americans, Young Blacks, and Hispanic Men Show Largest Increases in Rates of Marijuana-Related Disorders



Survey data collected 1991-1992 and 2001-2002 show little increase over the decade in rates of marijuana smoking, but overall prevalence of marijuana-related disorders increased by 22 percent. Increases in a few demographic groups accounted for most of this increase.

The study also reveals a shift in marijuana use and its associated problems among older adults, Dr. Compton says. "Marijuana smoking increased by 167 percent and the prevalence of marijuana-related disorders quadrupled among men and women aged 45 to 64," he observes. "Given this shift, the possibility that marijuana may contribute to health problems among the aging population deserves research attention."

The surveys do not explain why disorders increased in some groups and not in others. However, increased potency of marijuana in the last decade may be partly responsible for the overall upward trend of marijuana-related disorders, the researchers speculate. Regardless of the causes, the sharp increases among minority groups merit further investigation, Dr. Compton says. "We see what could be described as a possible epidemic of marijuana-related disorders among young adult minorities. It probably has been going on undetected for years, and points to the need for specifically targeted prevention and intervention efforts."

Source:

- Compton, W.M., et al. Prevalence of marijuana use disorders in the United States: 1991-1992 and 2001-2002. *JAMA* 291(17):2114-2121, 2004.
[[Abstract](#)]

Defining Marijuana-Related Disorders

"Although the American Psychiatric Association's DSM-IV was not published until 1994, proposed diagnostic criteria for marijuana abuse and dependence had been circulated earlier," says Dr. Bridget Grant of NIAAA, who was the principal investigator of the National Longitudinal Alcohol Epidemiologic Survey fieldwork and, a decade later, in the National Epidemiologic Survey on Alcohol and Related Conditions. "These criteria were incorporated in their entirety into the structured interview used in both surveys." Survey respondents were considered to be suffering a marijuana-related disorder if they met DSM-IV diagnostic criteria for either abuse or dependence.

Marijuana abuse

A respondent had to report experiencing at least 1 of the following 4 criteria in the 12 months preceding the survey:

- Recurrent marijuana use resulting in failure to fulfill major role obligations;
- Recurrent marijuana use in physically hazardous situations;
- Recurrent marijuana-related legal problems; and

- Continued use despite recurrent or persistent social or interpersonal problems caused or exacerbated by marijuana use.

Marijuana dependence

This disorder's diagnosis required respondents to report past-year experience of at least 3 of the following 6 criteria:

- Need for increased amounts of marijuana to achieve desired effect;
- Use of marijuana in larger amounts or over longer periods than intended;
- Persistent desire or unsuccessful efforts to cut down marijuana use;
- A great deal of time spent obtaining, using, or recovering from the effects of marijuana;
- Giving up important social, occupational, or recreational activities in favor of using marijuana; and
- Continued use despite persistent or recurrent physical or psychological problems caused or exacerbated by use.

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