STASH Vol. 3(1) – The transition from drug use to drug dependence: The bridge to more troubled waters

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At some point in life, most of us have used, perhaps even repeatedly, substances with the potential for dependence. Many people at least try drugs such as alcohol, marijuana, or cocaine. However, few people progress from being users to becoming abusers or drug dependent.

This issue of STASH presents a series of related reports investigating the transition from drug use to drug dependence for alcohol, marijuana, and cocaine. The reports provide probabilities for drug use and drug dependence (Anthony, Warner, & Kessler, 1994), compare the time lag between initiation of use and development of drug dependence across the different drugs (Wagner & Anthony, 2002), and examine whether there are gender differences in these transition patterns (Wagner & Anthony, 2007).

Each of these reports used data from the National Comorbidity Survey (NCS) 1990-1992, a large-scale study designed to estimate prevalence and comorbidity of psychiatric disorders in the United States general population. Researchers used the total sample of 8,098 participants between the ages of 15 and 54 in the analyses of probabilities for drug use and drug dependence. For analyzing gender differences, researchers referred to a subsample of 6,792 participants between the ages of 15 and 45 years (Chen, Wagner, & Anthony, 2002; Wagner & Anthony, 2007). In the NCS, each participant completed a face-to-face structured interview yielding DSM-III-R diagnostic criteria for dependence on alcohol, marijuana, and cocaine (American Psychiatric Association, 1987). For each drug, age at drug use initiation and age at onset of drug dependence were assessed by standardized questions. Analyses estimated the probabilities of initiation of use and calculated risks of transitions from first use to dependence.

Among the 8,098 participants in the total sample, there were 7,485 alcohol users, 3,940 marijuana users, and 1,337 cocaine users. Of the persons who tried

alcoholic beverages at least once, 15-16% eventually developed alcohol dependence. The rate was similar for cocaine users, 16%-17%, and lower, 9%, for marijuana users.

The probabilities of initiation of drug use peaked at age 18 for alcohol and marijuana, and at age 20 for cocaine (Figure 1). The risks of developing drug dependence among drug users showed a peak during the teen years for alcohol and marijuana, and at age 23 to 25 for cocaine (Figure 2). A closer look at the shapes of the risk curves revealed additional differences across types of drugs: the risk of cocaine dependence occurred early and explosively after first cocaine use and continued to be high for about a decade after first cocaine use. Alcohol and marijuana dependence emerged somewhat slower. While the risk of developing marijuana dependence leveled off, the risk of developing alcohol dependence persisted for decades. The researchers found gender differences among the risks of drug dependence for marijuana but not for alcohol or cocaine. Male marijuana users were roughly twice as likely as female marijuana users to become dependent in the 2 to 5 years after first use.

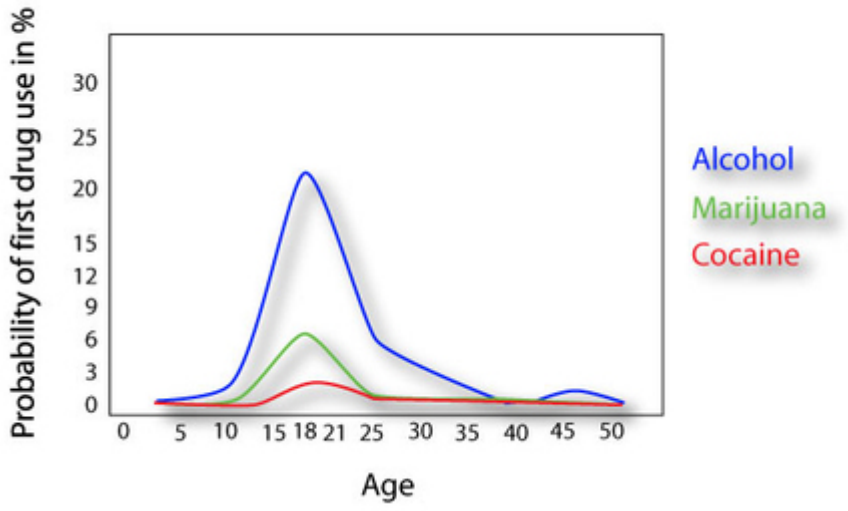

Figure 2:

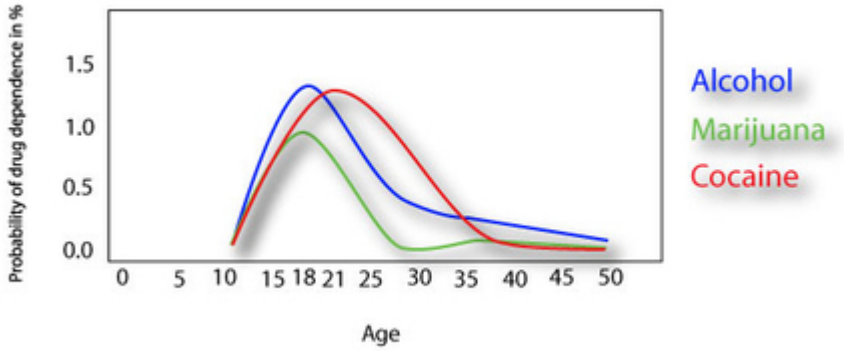

Figure. Probabilities of drug use initiation, by age (adapted from Wagner & Anthony, 2002) and probabilities of drug dependence among drug users, by age (adapted from Wagner & Anthony, 2002). Click image to enlarge.

Limitations of the analyses include the use of a cross-sectional data set, which precludes obtaining longitudinal observations, and the use of slightly different samples between the studies, which limits direct comparisons. A focal issue that needs to be considered when interpreting the findings is that all analyses are based mainly on two variables, namely age of onset of first drug use and age of onset of drug dependence. These two measures rely on accurate participant recall for the times and dates of past events, a challenging cognitive task for both younger and older adults. The measures potentially are subject to underreporting regarding the use of illicit substances or alcohol drinking as minors because participants might minimize their reports of illegal activities in the past. Also, these two measures represent composite indices that do not differentiate factors that might moderate the risk of drug dependence (e.g., distinguishing occasional use from regular use, quantities and frequencies of use, dosage forms such as beer vs. liquors, or means of drug administration such as oral, nasal, or inhaling).

Confirming previous research, these studies found the highest probabilities for first use of alcohol, marijuana, or cocaine before the age of 25 years. Extending previous findings, the studies revealed that the peak risks for developing dependence on alcohol, marijuana, or cocaine also occurred before the age of 25 years. Thus, drug dependence is a psychiatric disorder that typically begins to evolve during adolescence and young adulthood regardless of the target drug. These findings suggest that public health interventions to prevent drug dependence should target individuals under the age of 25.

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