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CHAPTER V

TOBACCO USE COMPARED TO OTHER DRUG DEPENDENCIES

CONTENTS

Introduction

The present Chapter compares cigarette smoking and nicotine with other forms of drug dependence and addicting drugs. Other chapters in this Report describe the behavior of cigarette smoking, the known biobehavioral mechanisms and modulators of nicotine's actions, and techniques for achieving abstinence from smoking. As is evident from this Report, cigarette smoking is most usefully explained and characterized as a drug dependence process in which nicotine is the identified drug of dependence. It is also evident that by either the World Health Organization (WHO) definition of "drug addiction" that was issued in the 1950s (WHO 1952) or by the definitions of "drug dependence" issued since the 1960s (WHO 1964, 1969, 1981), nicotine is appropriately categorized as an addicting or dependence-producing drug. Its designation as a drug is also consistent with the definitions provided by the WHO (1981) and the Food and Drug Administration (FDA) (1987). Nicotine-delivering tobacco preparations (which include all currently marketed tobacco preparations) could, therefore, be appropriately categorized as addicting or dependence-producing drugs. In addition to evaluating nicotine with respect to definitions of dependence-producing drugs, it is also useful to compare features of tobacco dependence and the pharmacologic properties of nicotine to other drug addictions and addicting drugs, respectively. This comparison is the purpose of the present Chapter.

Two of the most widely studied drug addictions provide standards to which other addictions may be compared. They are the addictions to the opium-derived or related substances ("opioids," e.g., morphine, heroin, methadone, codeine) and to alcohol. For nearly a century, it has been widely accepted that use of these substances could lead to addictive behavior and to adverse effects. Moreover, such consequences of use develop in a sufficient number of persons that there have been recurrent regulatory efforts to restrict access and conditions of use. Cocaine and related psychomotor stimulants (e.g., amphetamine) provide an additional important standard by which to judge suspected and known addicting chemicals. These stimulants have been accepted as standards by which to evaluate the addicting potential of other stimulants since the 1950s.

It is beyond the scope of the present Chapter to review all aspects of drug dependence in detail. Rather, this Chapter summarizes primarily the pharmacologic aspects of drug dependence. In particular, the Chapter provides information that permits a comparison of the pharmacologic basis of tobacco dependence, as described in the other Chapters, with the pharmacologic basis of other forms of drug dependence. More extensive reviews of the topics to be discussed have emerged from various review panels sponsored by the National Institute on Drug Abuse (NIDA) (Krasnegor 1978, 1979a,b,c; Thompson and Johanson 1981; Grabowski, Stitzer, Henningfield 1984;

Sharp 1984) and the National Academy of Sciences (Levison, Gerstein, Maloff 1983); other reviews have been held under the auspices of professional scientific societies (Goldberg and Hoffmeister 1973; Thompson and Unna 1977; Balster and Harris 1982; Taylor and Taylor 1984; Seiden and Balster 1985). Other important determinants and consequences of drug dependence are more thoroughly described elsewhere (Blaine and Julius 1977; Manatt 1983; Tims and Ludford 1984; Petersen 1978; Bell and Battjes 1985; Richards and Blevens 1977; Dupont, Goldstein, O'Donnell, Brown 1979; Lettieri, Sayers, Pearson 1980; Crowley and Rhine 1985).

Clinical Characteristics of Drug Dependence

Drug Dependence Defined

Before the 1960s it was fairly common to invoke factors such as "criminality," "character deficit," "immorality," and "weakness of will" in the clinical diagnosis of "drug addiction." In addition, these factors often included various social connotations. In part, it was because these attributes were not objective or scientifically based that the WHO in 1964 recommended that the term "addiction" be replaced with "drug dependence" in an effort to be more precise and descriptive in definition (WHO 1964, 1981).

According to current conceptualizations, the central and common element across all forms of drug dependence is that a psychoactive drug has come to control behavior to an extent that is considered detrimental to the individual or society (WHO 1981; APA 1987). Although the precise wording varies, the central concept of drug-dependence definitions refers to the behavior of the individual who has come under the control of a psychoactive drug, and this concept has provided the cornerstone of most definitions of dependence/addiction for at least a century (Berridge 1985) and arguably for several centuries (Murray et al. 1933; Austin 1979; Levine 1978). The involvement of a psychoactive drug is the critical feature that distinguishes drug addictions from other habitual behaviors.

In principle, the term "drug dependence" might be used to characterize any form of drug ingestion; however, the term is generally reserved for use when the chemical meets criteria as a "psychoactive" drug. These criteria are based on drug-induced changes in brain function; such changes may involve alterations in mood, feeling, thinking, perception, and other behavior. In this Chapter the term "drug dependence" or "drug addiction" refers to self-administration of a psychoactive drug in a manner that demonstrates that the drug controls or strongly influences behavior. In other words, the individual is no longer entirely free to use or not use the substance. Often times, this reduction in the degree to which use

TABLE 1.—Diagnostic criteria for psychoactive substance dependence

A. At least three of the following:

(1) Substance often taken in larger amounts or over a longer period than the person intended

(2) Persistent desire or one or more unsuccessful efforts to cut down or control substance use

(3) A great deal of time spent in activities necessary to get the substance (e.g., theft), to take the substance (e.g., chain smoking), or to recover from its effects

(4) Frequent intoxication or withdrawal symptoms when expected to fulfill major role obligations at work, school, or home (e.g., does not go to work because of hangover, goes to school or work "high," intoxicated while taking care of own children), or when substance use is physically hazardous (e.g., drives when intoxicated)

(5) Important social, occupational, or recreational activities given up or reduced because of substance use

(6) Continued substance use despite knowledge of having a persistent or recurrent social, psychological, or physical problem that is caused or exacerbated by the use of the substance (e.g., continuing heroin use despite family arguments about it, cocaine-induced depression, or ulcer made worse by drinking

(7) Marked tolerance: need for markedly increased amounts of the substance (i.e., at least a 50 percent increase) to achieve intoxication or desired effect, or markedly diminished effect with continued use of the same amount

(Note: The following items may not apply to cannabis, hallucinogens, or PCP)

(8) Characteristic withdrawal symptoms (see specific withdrawal syndromes under Psychoactive Substance-Induced Organic Mental Disorders)

(9) Substance often taken to relieve or avoid withdrawal symptoms

B. Some symptoms of the disturbance persistent for at least 1 month, or occurrent repeatedly over longer period of time

SOURCE: American Psychiatric Association (1987).

is considered "voluntary" is described as "habitual" or "compulsive" drug use.

Diagnostic Criteria for Drug Dependence

The Diagnostic and Statistical Manual (DSM-III-R) of the American Psychiatric Association (APA 1987) provides a useful example of the objective criteria currently used to define drug dependence. As stated in DSM III-Revised: "The essential feature of this disorder is a cluster of cognitive, behavioral, and physiological symptoms that indicate that the person has impaired control of psychoactive substance use and continues use of the substance despite adverse consequences." Specific diagnostic criteria for psychoactive substance dependence are shown in Table 1.

The APA designated 10 classes of psychoactive substance for which use may lead to dependence: alcohol; amphetamine or similarly acting sympathomimetics; cannabis; cocaine; hallucino-

gens; inhalants; nicotine; opioids; phencyclidine (PCP) or similarly acting arylcyclohexylamines; and sedatives, hypnotics, or anxiolytics. The fact that dependence criteria are the same for all classes of drug use highlights the assumption that dependence processes are functionally similar across substances with different pharmacologic profiles.

Features of Drug Dependence

Behavior that leads to drug ingestion, as well as the various behavioral and physiological sequelae resulting from the ingestion, are determined by both drug (pharmacologic or agent) and nondrug (behavioral or environmental) factors which will be discussed in this Chapter. The nondrug determinants include characteristics of the individual ("host" characteristics) such as age, genotype, and personality.

Highly Controlled or Compulsive Drug Use

Highly controlled or compulsive drug use indicates that drug-seeking and drug-taking behavior is driven by strong, often irresistible urges. It can persist despite a desire to quit or even repeated attempts to quit. Compulsive drug use may take precedence over other important priorities.

The extent to which compulsive behavior is apparent varies across individuals and is most easily detected in extreme cases. For example, to maintain daily drug intake laryngectomized patients may smoke cigarettes through their tracheostomy hole, cocaine users may take cocaine at the risk of loss of family and job, and prostitution has been observed to occur in exchange for a variety of drugs for which availability was low or price was high.

The drug-seeking behavior itself ranges from the routine and licit procurement of cigarettes or alcohol, to the possibly more extensive behavioral repertoire necessary to obtain prescriptions for certain drugs, to the highly intricate chains of behavior required to procure many illicit drugs. Drug-seeking behavior is not determined entirely by the specific pharmacologic properties of a particular drug, however. For instance, when alcohol or tobacco has been prohibited, procurement has at times involved as much risk and involvement as the procurement of illicit drugs in the 1980s (Austin 1979; Brecher 1972).

A drug may be taken to avoid withdrawal symptoms and other undesirable sequelae of drug abstinence. This factor may contribute to the level of compulsivity which develops. Addicting drugs often provide some therapeutic benefit or otherwise useful effect (Chapter VI); these effects may also contribute to the compulsive nature of drug use. Whether or not such benefits are considered to be more