Clandestine Laboratories, Dynamic Systems, and the Deep Social Impact of Methamphetamine Abuse in Oklahoma

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Abstract

Ranking third behind California and Missouri on the total number of clandestine laboratories seized by law enforcement officers, Oklahoma has the highest number of illegal methamphetamine laboratories per capita in the United States. This paper examines the deep social impact of the recent outbreak of clandestine laboratories in Oklahoma and the corresponding rise in methamphetamine abuse. Because methamphetamine genetically restructures the human brain, neurophysiological morbidity associated with chronic abuse reveals damage to the limbic system, which, in turn, is associated with correlative behavioral problems in abusers that has been characterized as clinically indistinguishable from paranoid-schizophrenia. A useful way of describing how these structural and functional changes in the brain (as a dynamic system) can have overarching effects, both in the individual and society, is the form of analysis known as 'chaos theory'. From this perspective, the behavioral changes are analogous to 'strange attractors' of a chaos theory model, which vividly illustrates the overall impact of methamphetamine abuse on both the individual's quality of life and the lasting effect on the social world.

Introduction

During the past five years there has been an exponential increase in the number of illegal methamphetamine laboratories seized by law enforcement officers in Oklahoma. In 1995, 34 labs were seized as compared with 781 in 1999. Over 700 illegal methamphetamine laboratories have been seized in the state the first nine months of 2000, with a projected year-end total of 1200 (OSBI, 2000). Only California and Missouri had more lab seizures, than Oklahoma who ranks third in the nation. Moreover, Oklahoma ranks highest per capita in the United States in the reported occurrences of clandestine methamphetamine laboratories. The problem of methamphetamine laboratories in Oklahoma provides an index to an array of deeper social and neurophysiological issues associated with chronic methamphetamine abuse. These problems transcend law enforcement concerns, impacting health care, substance abuse treatment, drug courts, education, and the correctional system.

This article overviews methamphetamine abuse in Oklahoma. This article also discusses chronic methamphetamine abuse causes actual damage to the limbic and meso-limbic areas of the brain –those parts associated with emotional stability— and other behavioral manifestations which spread to other dimensions of the social life-world. A demographic area undergoing increased methamphetamine abuse can expect a collateral increase in domestic violence and other crimes involving violence. This article finally suggests that a comprehensive multi-disciplinary approach is the only viable solution to this outbreak of chronic methamphetamine abuse in Oklahoma.

Background of Methamphetamine Laboratories

Methamphetamine was first discovered in 1913, yet the first documented case of illegal manufacture in the United States occurred in California in 1963. At that time, an individual wanting to synthesize the drug needed to understand complex chemical equations in order to successfully translate the technical literature into a process (Duncan, 1991). Hence, early clandestine laboratories tended to be operated

by advanced chemistry students. Within only a few short years, complex technical formulae were written into simple "recipes" that anyone could follow (Duncan, 1991). Initially, these recipes were closely guarded secrets and only passed on through apprenticeship.

It is speculated that historical connections between families in California and Oklahoma, as a result of great 'dust bowl' days, recipes for manufacturing methamphetamine emerged in Oklahoma in the late 1970's. Consequently, in the early 1980's, there was a severe outbreak of clandestine methamphetamine laboratories in Oklahoma which lasted until 1990 (Duncan, 1990). In fact, Oklahoma was fourth in the United States on law enforcement seizure of clandestine laboratories in the 1988-89 period.

These early laboratories were usually very large, with a minimum of one and often up to a dozen 22-liter reaction flasks operating at once. Each of these laboratories had an average production capacity of about 27 pounds of methamphetamine per week. The main precursor chemical used was phenylacetic acid, purchased in bulk quantities from chemical distributors. Since the recipe required about 36 hours to complete, and because phenylacetic acid was extremely odorous, these laboratories were usually found in rural areas of Oklahoma. Typically, the finished product, which was around 70 percent pure d,l-desoxyephedrine, was transported to the larger metropolitan areas of Tulsa and Oklahoma City where it was then 'cut' (i.e., adulterated to a purity level of approximately 12 percent for street level consumption) and sold at various levels to drug dealers. Clandestine laboratory operators were a primary source of illegal drugs and were at the top of a 'pyramid', the base of which was the user (Duncan, 1990).

The Oklahoma law enforcement strategy was to push for legislation that would control the availability of certain bulk chemicals (such as phenylacetic acid), increase the criminal penalty for illegal manufacturing from two to10 years to 20 years to life, and provide law enforcement training programs for local officers in the how-to's of recognition and investigation of clandestine laboratories. This strategy was passed in the legislative year 1989 and implemented in 1990. The results were immediate –clandestine laboratory activity in Oklahoma dropped from 73 labs in 1989 to only 15 in 1990 (Duncan, 1990). While it appeared that the methamphetamine laboratory problem in Oklahoma had passed, it was clear that the street availability of methamphetamine had not changed: a 1 gram bag of roughly 12 percent pure methamphetamine was still easily purchased for between $100 and $125 (OBNDD, 1990).

A 'new' recipe from California then emerged in Oklahoma, with a newer, simpler manufacturing method. It was now possible for a non-chemist to manufacture virtually pure methamphetamine (d-desoxyephedrine, which is stronger than the d,l variant), in only four hours using supplies available at local grocery and hardware stores, and without producing the tell-tale odors that were inherent in the older, more cumbersome method (Duncan, 1991). This new recipe, unlike previous ones, was readily available through publications and, more recently, over the Internet. There had been a paradigm shift within the world of clandestine laboratories –information was ubiquitous.

Consequently, law enforcement officers in Oklahoma witnessed a rapid increase in clandestine methamphetamine laboratory activity. Contrary to their ancestors, these laboratories were generally small, comprised of household appliances (hotplates, crock-pots, and pickle jars) and ordinary chemicals (ephedrine and pseudoephedrine –common sinus medications—were the main precursors). Since odors associated with operating these labs were virtually nonexistent, the bulk of clandestine laboratory activity appeared in cities, such as Tulsa and Oklahoma City.

Not only did the recipe and demographics of clandestine laboratory activity change in Oklahoma, there was a more telling change in the very nature of the methamphetamine distribution network. The old pyramid structure, although still

in place with drugs smuggled in from Mexico, became more of a 'rhizomatic' structure, characterized by the remarkable decrease in social distance between production and consumption. These small labs are easy to operate and can produce small quantities of nearly pure methamphetamine in a shorter period of time. Even though lab numbers dramtically increased, production capacities for each lab dropped from 27 pounds per week in 1989, to about one to six ounces per cook in the late 1990's.

In 1989 the average clandestine laboratory operator was a 34 year old white male, about with little or no college education. In the late 1990's the description of a laboratory operation was expanded to include females, Hispanic males, and college educated individuals (OBNDD, 1990), (OBNDD, 1999). Typically in Oklahoma, chronic methamphetamine users now produce their own product. The user and producer are often the same person, similar to the lower-level marijuana growers in Oklahoma.

Rise of Methamphetamine Abuse in Oklahoma

An increase in methamphetamine laboratories alone might not imply that there is a corresponding increase in chronic methamphetamine abuse in Oklahoma. There are, however, other indications that this is the case. A recent study conducted by the Oklahoma Department of Mental Health and Substance Abuse Services (DMHSAS) showed that "the rate of stimulant use in Oklahoma is 42% higher than the national rate (Dixon, 2000)." In comparing Oklahoma to the overall United States, an analysis of lifetime stimulant use shows significantly higher percentages, with the largest difference in ages in the 26 to 34year-old catergory. Accordingly, while the national average for stimulant use in this age group is 7.7 percent of the population, in Oklahoma that number is 13.7 percent. The next highest age group is between 18 to 25 year-olds, where the national average is 6.5 percent and the Oklahoma mean is 9.3 percent (Dixon, 2000).

The number of methamphetamine users in treatment in Oklahoma is also significantly higher than the national average. From slightly more than 500 patients in 1992, Oklahoma has seen an increase to roughly 3,400 patients receiving treatment for methamphetamine abuse currently (Dixon, 2000). This is significant, particularly since the national average is higher than the Oklahoma average in all other controlled drug categories (e.g., marihuana, cocaine, opiates, inhalants, hallucinogens, and sedatives) (Dixon, 2000). Furthermore, there is a significant treatment gap in Oklahoma - - about 76.7 percent of those in need do not receive treatment (Dixon, 2000).

These figures, coupled with the increases in methamphetamine laboratory seizures, indicate that there is an outbreak of chronic methamphetamine abuse in Oklahoma. Because of the nature of the drug itself, and the kinds of changes that it can bring about in the central nervous system of a chronic user, it is likely that other areas of social concern will be impacted by this outbreak. Moreover since neurological damage caused by chronic methamphetamine abuse is most often permanent, the overall social impact of this phenomenon will linger. For this reason, it is important to examine the effects of methamphetamine on the brain and its resultant adverse behavioral manifestations.

Basic Neurophysiological Effects of Methamphetamine Abuse

There are many reasons why a person may become a chronic drug abuser. Genetic propensity for addiction, pre-existing psychiatric problems (bipolar, depression, anxiety disorder), influences of the social life-world (economics, social values, peer pressure, etc.), and fundamental existential conditions (e.g., Heidegger's being-toward-death, forlornness, and angst) (Heidegger, 1996). These characteristics are often a feature of the human condition, thus every person who becomes a chronic drug abuser likely had one or more of these influences before using drugs. In fact, some medical professionals contend that up to 80 percent of chronic

drug abusers are really dually diagnosed patients seeking drugs due to an existing brain chemistry problem (Holloway, 1999). However, while there may be underlying brain chemistry problems prior to methamphetamine abuse, chronic use of the drug will certainly change some fundamental aspects of overall brain chemistry. Through understanding these changes and articulating the corresponding behavioral manifestations, the long-term impact of chronic methamphetamine abuse will become more apparent.

The action of methamphetamine upon the central nervous system can best be understood from the perspective of two fundamental processes: dopamine and norepinepherine neurotransmitters. The methamphetamine molecule is shaped very much like these two important neurotransmitters and has a serious effect upon the parts of the brain that are specific to these systems (Snyder, 1996). Methamphetamine molecules metabolize and cause the release and re-uptake of dopamine to speed up in an unnaturally vicious cycle that impairs the normal function of the neuron. This cycle peaks in only a few minutes, gradually diminishing over approximately 18 hours. During this cycle, the neuron is highly overworked, progressively diminishing the ability of the neuron to function properly, thus permanently damaging the dopamine and norepinepherine systems of the brain (NIDA, 2000). To understand the social impact of this change in brain chemistry, it is useful to look first at how this change most often leads to the aberrant behavioral patterns associated with chronic methamphetamine abuse.

Dopamine is a catecholamine neurotransmitter that acts on the limbic system of the brain, which has been associated with the initial appraisal of the safety or danger inherent within immediate spatial proximity (Snyder, 1996; Carpenter, 1991; Julien, 1998; Carter, 1998). Deficiencies in dopamine are usually accompanied by corresponding anxieties about personal safety and self-control. This can manifest itself in many ways, but usually does so as an intense paranoia about the world and personal relationships. Dopamine is also a critical component of the pleasure-reward systems of the brain. As a result, malfunctioning of the system frequently leads to emotional instability and to an alteration in incentive salience (Robinson and Berridge, 1998).

Norepinepherine, like dopamine, is associated with the limbic area of the brain. It is released in large quantities when immediate danger is perceived. Typically, norepinepherine causes an increase in blood pressure, heart rate, and bronchodialation. It is also associated with aggressive behavior resulting from an immediate emotional trigger (Snyder, 1996). The heightened effects of dopamine and norepinepherine produced by chronic methamphetamine abuse cause both permanent brain damage and specific behavioral changes that are manifested as paranoia, emotional instability, aggression, violent reactions, and inappropriate response to environmental stimuli.

The impact of methamphetamine abuse upon the dopaminergic and norepinepherine systems of the brain causes serious and permanent neurological damage. Consequently, a major characteristic of a serious outbreak of methamphetamine abuse is a corresponding increase in occurrences of problems resulting from neurological damage. Primarily, these cognitive-behavioral changes will affect mostly the immediate family, gradually reaching into other areas of the social world. It is useful to examine the manner in which a small change in brain functioning ability, particularly one that affects emotional stability can manifest large changes in the overall behavioral system of an individual suffering from methamphetamine damage.

Butterflies and Behavior: Chaotic Systems

Although the mind resists reduction to brain states, it is clear that there is at least some correlation between brain activity and cognitive life (Carter, 1998; Churchland, 1989). Furthermore, different parts of the brain when damaged show consistent behavioral changes in patients (Carter, 1998). Given these parameters, it is likely that the neurophysiological ef-

fects of chronic methamphetamine abuse have some corresponding impact upon behavior.

One innovative model of human behavior has been proposed by Ben Goertzel, a leading figure in the emerging realm of 'chaos theory' (Goertzel, 1995). Chaos theory examines the qualitative patterning of nonperiodic dynamic systems. Chaos theory offers a valuable way of illustrating the deeper impact of chronic methamphetamine abuse on the larger universes of individual behavior and social reality. First, it will be useful to examine some of the fundamental features of this modeling method.

For purposes of analysis, any deterministic, dynamic, nonperiodic system, such as the weather, can be reduced to a single point in a representative field known as 'phase space' (Williams, 1997). As the entire system changes, the phase space representation traces a series of non-intersecting curved orbits, which, in nonperiodic systems, have come to be known as 'strange attractors'. Sublime phase space portrayals of strange attractors are extremely aesthetically pleasing, leading many thinkers to believe that what on the surface appears as random and uncoordinated may actually reveal a deeper logic in some complex pattern. The overall shape of the strange attractor changes dramatically when a slight modification is made to any aspect of the initial condition, a phenomenon is known as 'sensitive dependence upon initial conditions', which demonstrates how, in these systems, a small change can have a large effect (Gleick, 1988). The well known example, stemming from Lorenz' experiments upon turbulent weather systems, is that a butterfly flapping its wings in one part of the world might have a huge effect upon the weather in a vastly different part of the world (Gleick, 1988). Goertzel applies this understanding of the overall dynamics of complex systems to human behavior (Goertzel, 1995).

People live in circles, and as such each one has certain behavioral responses that, although not fully deterministic, tend to resemble 'semi-regular' patterns. The butterfly effect observed by Lorenz in weather systems can be applied as a metaphorical model to the qualitative analysis of human behavior. This model reveals that slight changes in an underlying feature of the overall system can bring with it dramatic changes in the behavior of that system. In the case of methamphetamine abuse, neurophysiological damage to the limbic system can lead to larger changes in the behavioral patterns of the abuser.

It is well known by both law enforcement officers and neuro-psychologists that methamphetamine users exhibit very wild behavior (Yui, et al, 1999). Typically, a methamphetamine abuser lives within a sphere of intense paranoia –they think that they are being followed, tend to distrust those with whom they have relationships, and frequently collect and intensely ideate about weapons and violence. Furthermore, they often manifest inappropriate emotional responses to environmental stimuli. For example, methamphetamine abusers tend to become highly aggressive and violent without provocation. Cases abound of methamphetamine associated crimes against persons, including brutal murders. As 'strange attractors', these behavioral patterns are qualitatively dissimilar to the general shape of 'normal' behavior.

Behavioral patterns, when manifested as a part of ongoing daily existence, tend to reinforce and create corresponding belief systems. Not surprisingly, bonding frequently occurs between those living in and experiencing the same behavioral patterns. Methamphetamine abusers tend to associate with other abusers, and a cycle of reinforcement of behaviors within the matrix of a social life-world emerges. This cycle, far from stable, operates as a chaotic system iterating in a nonperiodic manner based upon progressive and varying feedback from the social landscape.

Iterations into the Dimensions of Social Reality

The dynamic system of individual behavior is itself a part of a larger social reality. There is a 'ripple effect' that tends to destabilize deeper areas of social dy-

namics. The destructive behavioral patterns associated with methamphetamine abuse affect family, friends, co-workers, and progressively impacts society. For example, Oklahoma Department of Human Services statistics reveal that in 1999, at least 21 percent of child abuse cases involved substance abuse by a caretaker and 4.2 percent of children removed from the mother at birth were born drug-exposed (DHS, 1999). It is not known how many domestic violence incidents in Oklahoma involved either methamphetamine abuse or resulted from emotional instability caused by methamphetamine-related brain damage.

Chronic methamphetamine abusers have a real need for the drug. They are addicted, both physiologically and psychologically, to the stimulant effects that bring their neurological system into a state where they can avoid the major depression and anxieties associated with low levels of dopamine and norepinepherine. The neurons producing these neurotransmitters have become exhausted and only function with added influence of strong stimulants. Burned out and desperate, methamphetamine addicts will do anything to obtain their 'lifeline' drug.

Prostitution, stealing, robbery, murder, drug dealing, and illegal drug manufacturing are only a few of the more common methods that chronic methamphetamine abusers use to fulfill their endless hunger for their drug of choice. Society responds by increasing criminal enforcement –more police officers, more prisons, and stiffer penalties; substance abuse providers are overwhelmed with unfulfilled treatment needs; and the educational system is charged with the responsibility of making sure that every child understands that drugs are dangerous. Drug courts are established as a way to link law enforcement, prosecution, and substance-abuse treatment in the hope of breaking the cycle of progressive iterations of increasingly menacing social catabolism. Yet, the solution is nowhere in sight. Social problems with deep neurobiological roots, manifested in the chaotic destabilization of acceptable behavioral patterns, that, in turn, change fundamental relationships such as family and friends, and spurring criminal activity resulting in long-term incarceration –coalesce into a problem with no simple solution.

Toward a Solution

Clearly, methamphetamine abuse in Oklahoma is a multidimensional problem. We are highest per capita in the law enforcement seizure of illegal methamphetamine laboratories; we exceed the national average in both treatment, unfulfilled need for treatment, and lifetime use of methamphetamine; and, we are groping with partial solutions such as increased law enforcement resources, longer jail sentences, and drug courts. Oklahoma is caught in a chaotic system that cannot return to a previous place where methamphetamine abuse had a lesser, more controllable, impact.

This article has demonstrated evidence of a significant outbreak of chronic methamphetamine abuse in Oklahoma. It has moreover shown that this outbreak can be seen as an 'index' to matters of deep social concern. Specifically, an often-overlooked aspect of this problem is its corollary long-term effect upon individuals suffering from methamphetamine brain damage. This functional impairment is frequently manifested as emotional instability, domestic violence, and child abuse.

These features of the methamphetamine problem in Oklahoma will require a commitment on the part of the citizens of this state to adopt a comprehensive strategy that addresses deeper social issues. Any solution to this problem must be comprehensive and multidisciplinary. It must involve law enforcement, treatment providers, domestic violence workers, health care professionals, child welfare workers, educators, and the community at large. Citizens of Oklahoma must realize that methamphetamine abuse is a nemesis that demands full attention. There is only one hope –a change in the mentality of our society --the reinvention of social practices that would give back more than they take. With such a change in the socio-aesthetic paradigm, the reinvention of shared un-

derstandings, and the honest recognition of a serious problem, methamphetamine abuse and its pernicious deep social impact may be ameliorated.

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