Flunitrazepam (Rohypnol) Abuse in Combination with Alcohol Causes Premeditated, Grievous Violence in Male Juvenile Offenders

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This study focuses on 19 juvenile offenders who were frequently intoxicated by flunitrazepam (FZ), almost exclusively under the brand name Rohypnol. Street names for Rohypnol tablets are Rophies, Ropies, Roofies, Ropes, Roches, Rochas, Rochas Dos, Rophs, Ropers, Ribs, R-25, Roach-2s, Trip and Fall, Remember All, Mind Erasers, Forget Pills, and the Date Rape Drug. An overdose of FZ gives an increased feeling of power and self-esteem, reduces fear and insecurity, and provides the belief that everything is possible. FZ is also associated with loss of episodic memory and with impulsive violence, particularly when combined with alcohol. The subjects were taken from a subpopulation of 47 male juvenile offenders from Swedish national correctional institutions. Background information for subjects was obtained by in-depth interviewing and personality inventories including the Zuckerman Sensation-Seeking Scales, the Eysenck Personality Questionnaire, and the Karolinska Scales of Personality. Data concerning previous criminal offenses was obtained from the Swedish National Police Board. Almost all of the FZ abusers had been previously sentenced for serious violent offenses. Our data suggest that FZ abused by psychiatrically vulnerable subjects (i.e., with high scores on boredom susceptibility and verbal aggression) poses a serious hazard both to the abusers as well as the community. Our results support the finding that FZ should be classified as a Schedule I drug (i.e., a drug similar to heavy narcotics).

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A number of studies indicate that aggressive behavior in young males predicts substance abuse.[1–4] The relationship between aggression and alcohol intake is moderated by a complex group of variables, including personality, experience, expectations, provocation, and amount of alcohol.[5] Miczek[6] postulated that there are pharmacological and behavioral determinants in that subgroup of individuals in whom various types of alcohol intoxication increases aggressive and violent behavior. In alcoholic violent offenders, only the impulsive subgroup has a low concentration of 5-hydroxyindoleacetic acid (5-HIAA) in cerebrospinal fluid (CSF).[7] This finding may reflect decreased central serotonergic turnover, which in turn is associated with anxiety-related intolerance to delay and deficient impulse control,[8] as well as with disturbances of glucose metabolism.[9]

Overview

Paradoxical Reactions Unexpected and unpredictable reactions to benzodiazepines (BZs), particularly diazepam, have been reported in earlier research. Paradoxical reactions include depression,[10] suicidal thoughts,[11] gross behavioral disturbances ranging from agitation to psychosis, and paranoid reactions, confusional stages, hypomanic and manic activity, extreme garrulousness and states resembling alcoholic intoxication,[12] impaired recall (particularly delayed recall),[13] and hostility.[14] DiMascio and colleagues[15] hypothesized that such paradoxical reactions may be "expected" in patients with a history of poor impulse control and aggressiveness.

Flunitrazepam (FZ) This drug, a BZ with strong sedative properties, and diazepam are different from some other BZs such as oxazepam, because of their rapid absorption and rapid entry into the brain. FZ is reported to be 10 times more potent than diazepam, causing muscle relaxation and impaired judgment. In some cases it can lead to amnesia (particularly anterograde amnesia) for up to eight hours and can also induce excitability or aggressive behavior in some users.[16] The effect of the short-time amnesia causes those who are intoxicated by FZ to be easily influenced by suggestions. The amnesia also affects episodic memory, the ability to recall personal experience. The drug also slows psychomotor performance. Sedation occurs 20 to 30 minutes after administration of a two-milligram tablet and lasts for approximately eight hours.

FZ was originally developed by Hoffman LaRoche in the 1960s and early 1970s as a rapidly acting hypnotic. It was first launched under the trade name of Rohypnol in Switzerland in 1975. FZ has been legitimately used in 64 different countries, often prior to surgery and to treat insomnia. It is the most widely prescribed sedative/hypnotic in Europe. In 1983, FZ was placed into Schedule IV at the 1971 United Nations Convention on Psychotropic Substances. In March 1995, FZ was moved to Schedule III by the World Health Organization and was the first BZ to require more rigid control. The Drug Induced Rape Prevention and Punishment Act of 1996 (P. L. 104-305), recently signed by President Clinton, makes it a crime in the United States to give a

controlled substance to anyone without their knowledge with the intent of committing a violent crime. The U.S. federal government has recently classified Rohypnol as a Schedule I drug, which places it in the same category as cocaine, heroin, and lysergic acid diethylamide (LSD; i.e., drugs with no medical purpose). FZ is not currently legal in Canada, even with a prescription.[16] In Germany, a two-milligram dose of FZ has recently been removed from retail distribution and has been restricted to hospital use only. This has been necessary because of the increasing abuse of FZ.

Nonmedical Use of Flunitrazepam FZ is often used for purposes that are not consistent with legal or medical guidelines. It is also reported to be popular among drug addicts. Teo and colleagues[17] reported Rohypnol abuse in Singapore as early as 1979 and emphasized its potential danger (i.e., violent and suicidal behavior, confusion with disorientation, and inability to recall relevant events). FZ is the BZ most frequently abused in Malaysia and Australia.[18, 19]

Abuse of FZ has been reported in Western Europe and the Caribbean over the last 10 years. Drug addicts often use FZ for various reasons (e.g., as a remedy for the depression that follows a stimulant high, to allay withdrawal symptoms and gain a state of oblivion, and to enhance the effects of low quality heroin) in addition to using opiates and cocaine.[20] In a study conducted with nearly 1000 Spanish heroin addicts, it was discovered that two of three subjects were BZ abusers and that the most preferred benzodiazepine was FZ.[21]

The pattern of such mixed abuse and possible interactions in addicts has been reviewed by van der Laan.[22] He noted paradoxical reactions to Rohypnol, including induced hostility and memory disturbances ("black-outs") and proposed that "people with a hot-tempered character are especially at risk."

In Sweden, FZ is legally available on the market. Rohypnol has been reported widely used among school children as young as 12 years old, as well as in high school students, commonly to enhance the effects of alcohol. Recently, Druid and Holmgren[23] examined a total of 15,800 blood samples collected at medicolegal autopsies performed in Sweden. The results show that in 44 cases the pathologist had stated "intoxication including solely FZ" (i.e., in which influence of alcohol or other substances and other contributory factors could be ruled out) as the immediate cause of death. The combination of alcohol and FZ abuse were also often the cause of death. In 139 cases, the pathologist had stated "intoxication in which more substance than FZ and/or significant alcohol concentrations were found" as the immediate cause of death.

Violent Behavior in Response to Flunitrazepam Research on violence related to FZ abuse is sparse. Gaillard and Phelippeau[24] have, however, investigated the effect of FZ on dream content. Compared with subjects given placebo, FZ subjects reported more verbal and physical aggressiveness in dream content.

In the United States, Rohypnol has been reported to aid in the commission of rape and in many cases has been used as

a "date-rape" drug because of its ability to affect willpower.[25–27] The result is that the victim knows something is happening but is unable to do anything about it. Because of the amnesia-inducing properties of FZ, the victim often can not remember what happened.

There is only one report of aggressiveness as a side-effect of FZ in the Swedish Medical Products Agency record; this was a case of a change in personality that involved an attempted murder. This low incidence of reported violence is considered remarkable by the authors of the current report because of the fact that their first-hand observations among juvenile delinquents and among violent offenders indicates that hostile aggressive behavior is indeed a *well-known* side-effect of this compound.* It is also noteworthy, that there are only 18 case study reports by the World Health Organization (WHO) about such effects, most of them concerning aggressive reactions when patients were treated with FZ for sleep disorders.

The authors have noted in forensic psychiatric patients that many of the violent situations occurred while the offenders were acutely intoxicated by FZ. In several cases, a series of violent crimes had been committed. It is also noteworthy that the offenders in many of these cases had been intoxicated by *both* FZ and alcohol.

Käthe Elmgren, MD, who is a fellow of The Legal Aid Council at The National Board of Health and Welfare in Sweden, described several cases involving persons who had repeatedly committed murder and who had been admitted to forensic psychiatric investigation in 1993.[28] All of the offenders, at the time of the murders, had been intoxicated by both FZ and alcohol. The cases were subjected to forensic psychiatric reexamination, but the court was unable to agree on whether the offenders could be held responsible for their actions. The abuse of FZ in Sweden has been involved in a number of important legal decisions in which it has been necessary to inform the courts, using expert opinions, as to whether an offender was suffering from a severe mental disorder at the time of the crime and whether the conditions required for forensic psychiatry treatment have been fulfilled.

Purpose of the Present Study The primary aim of the present study was to find answers to the questions related to *why* some of male juvenile delinquents from Swedish national correctional institutions abuse FZ and what drives these subjects to abuse FZ when other juvenile offenders resist such a temptation.

Another aim was to compare prevalent background variables for the two subgroups of interest (i.e., FZ abusers and non-FZ abusers) such as, for example, family situation, housing area, previous treatment, childhood psychological contact, patterns of abuse, and previous criminal offenses. It is also intended to compare the personality profiles of the FZ abusers with those of a group of non-FZ user juvenile offenders, with the purpose of discovering possible vulnerability factors associated with FZ abuse.

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Materials and Methods

Study Subjects This study was performed as part of a larger personality study conducted on 47 male subjects recruited from four representative Swedish national correctional institutions for juvenile offenders sentenced for serious offenses.[29,30] Subjects ranged in age from 14 to 20 years and averaged 17 years (SD = 1.2) and fulfilled the DSM-IV[31] criteria for Conduct Disorder, implying criminal activity, among other things, before the age of 15 years. Subjects were informed about the purpose of the study, and the study was approved by the Uppsala University Ethics Committee. All of the residents of the participating institutions were invited to participate, and only two declined.

Some of the subjects were treated by doctors at the institutions (the most commonly prescribed drug was oxazepam). The aim of this treatment was to reduce the violent behavior of subjects, to reduce their dependency on other drugs (e.g., heroin, referred to by the subjects as "chasing the dragon"), and to treat abstinence from alcohol or BZs. Almost 70 percent of the subjects were reported to have been convicted of serious violent offenses two or more times. Three of four subjects reported early onset alcohol abuse combined with other drugs or combinations of drugs. Subjects who had started drinking heavily before the age of 25, and who had repeatedly lost their impulse control during their alcohol intake, were classified by some researchers as Type 2 alcoholics.[32]

Structured Interview The structured face-to-face interview lasted approximately 1.5 hours and covered background information, with a focus on sociological issues.

In-Depth Interview In the present study, qualitative data choice and inductive analysis were used to conduct an in-depth study of the subjects' abuse of FZ. The advantage of a qualitative approach is that it produces a wealth of detailed data about a small number of people and cases. Qualitative data provides depth and detail in the form of direct quotations and careful descriptions of situations, events, people, interactions, and observed behaviors.[32–35] Goldstein[36] used such methods to highlight the causes of juvenile delinquency and its prevention and remediation.

In the present study, semistructured in-depth interviews, based on the interpersonal communication theory,[37] were used to gather background information that focused on psychological issues, experiences of emotional states in criminal situations, and aggressive behaviors while acutely intoxicated by FZ. These interviews took between one-half to two hours depending on factors such as how articulate the subject was, the subject's age, and previous experience of intoxication with FZ.

Generally speaking, the in-depth interviews for each subject may be described as commencing in a topic-relevant but essentially nondirective, open-ended, and broadly structured manner. As the interview progressed, depending on richness or paucity of information obtained, the style became more specific, closed, and

narrowly structured.[†] Information evolving from the interviews was transcribed and specifically labeled systematically in the form of quotations. The main findings were typically comments relating to FZ.

The abuse of BZs was established by a criterion applied to the self-reported information. Subjects were specifically asked: "Are you a benzodiazepine abuser?" If a subject answered "Yes" to this question, he was then asked: "Are you a flunitrazepam abuser?" An overconsumption of FZ was defined as anything greater than a two-milligram dose. The BZ abusers were asked to give their reasons for a greater preference for FZ. Acute intoxication by FZ was also investigated to gather information concerning how the violence manifested itself. The intention of the interviews was to gain an insight into the FZ abusers' thoughts and feelings, the nature of the experiences occurring during abuse, and the behavior patterns occurring before, during, and about two weeks after intoxication.

The Swedish National Police Board Additional information about offenses committed by subjects after they had reached the age of 15 was supplied by the Swedish National Police Board. This data covered all offenses leading to public prosecution and conviction, and was obtained for all subjects 18 months after the interviews. It was hoped that this information would supplement the interview data regarding previous criminal offenses. Only information concerning offenses committed before the interviews are considered in the present study.

Personality Inventories The following three personality inventories were administered to measure traits assumed to reflect the biological basis of personality.

The Karolinska Scales of Personality (KSP)[38] This group of scales includes a socialization scale based on items from the Gough Delinquency Scale.[39] The KSP consists of 135 questions grouped into 15 scales: impulsiveness, monotony avoidance, detachment, socialization, social desirability, somatic anxiety, muscular tension, psychic anxiety, psychasthenia, inhibition of aggression, and the aggressivness-related scales: indirect aggression, verbal aggression, irritability, suspicion, and guilt. Of particular importance with regard to the present study are: (1) the monotony avoidance scale (measuring sensation-seeking using more general items correlated with the General Sensation Seeking scale (G) at $r = .50$ and the Boredom Susceptibility (BS) at $r = .51$,[40] the correlations for the subjects in this study were earlier found to be $r = .46$ for G and $r = .29$ for BS[29, 30]); and (2) aggressiveness-related scales adapted from the Buss-Durkee Hostility Inventory,[41] which concern indirect aggression (reflecting undirected anger), verbal aggression (including arguing, shouting, and being overly critical), irritability, suspicion (including projection of ill will onto others), and guilt (reflecting aggressiveness with or without guilt feelings).

The Eysenck Personality Questionnaire (EPQ-I)[42] This questionnaire includes an impulsivity scale from the Impulsiveness-Venturesomeness-Empathy

[†] All of the interviews were carried out by A.M.D., who has been trained in in-depth interview techniques at the Department of Psychology, Stockholm University, Stockholm, Sweden.

inventory.[43] The EPQ-I consists of 114 true/false questions and is classified into an extraversion scale, a neuroticism scale, a psychoticism scale, and a lie scale.

The Zuckerman Sensation-Seeking Scales-Form V (SSS-V)[44] The SSS-V consists of 40 forced-choice items (10 items for each scale) classified into the following factors: Thrill and Adventure Seeking (TAS), Experience Seeking (ES), Disinhibition (Dis), Boredom Susceptibility (BS). Of particular importance to the present study are the ES scale reflecting the pursuit of new sensory experiences in music, art, drugs, and spontaneous lifestyle, and the BS scale describing aversion to routine activities, work, and people regarded as boring. The sensation-seeking scales are presumed to reflect levels of catecholamines and their respective enzymes and are based on the concept of an optimal level of arousal, assuming that individual differences in optimal levels of stimulation are basic personality dimensions.[40]

Treatment of Data The qualitative data are presented in combination with the quantitative data. The data from the in-depth open-ended interviews consist of direct quotations from FZ abusers about their experiences, opinions, feelings, and knowledge in relation to the frequent overconsumption of FZ. The first step in gaining theoretical sensitivity was to analyze the interview notes with as few predetermined ideas as possible. Grounded Theory[33] assumes that part of the method is the writing of theory (data must be coded, ideas noted, and the resulting memoranda sorted in a particular way). Conceptual ideas become the essence of theory. When good ideas were generated in thoughts, they were immediately transcribed in the form of a memo. By comparing the data as they were collected, they could be formulated into core categories, and modifications could then be made to help explain surprising or new variations. This procedure aided in the creation of theoretical connections at a more abstract level and transcended preceding theories by placing all relevancies in a multivariate schema possessing both greater scope and a higher conceptual level.

The aims of the present study were also to investigate the subjects' backgrounds and the nature and frequency of criminal offenses committed by them while under the influence FZ. Typescripts of 47 structured interviews and information from the National Police Board constituted the raw data of the study with regard to the main demographic characteristics (e.g., family situation, drug abuse, criminal offenses committed by the subjects). Nonparametric statistical analyses (Kendall's *W*) were applied to investigate groups differences.

The use of the personality scale scores was also intended to enable a comparison between juvenile offenders who were frequent FZ abusers and juvenile offenders who were not FZ abusers. An examination of the group differences was carried out by applying one-way analyses of variance (ANOVAs). *Post hoc* tests (Scheffé) were also carried out to highlight the differences between groups. To adjust for the effect of age, the mean personality scores for subjects were transformed into age-related and sex-related T scores for the Zuckerman SSS. These calculations

were based on the means and standard deviations from a group of introductory male psychology students (n = 686) at the University of Delaware.[44] For the KSP and EPQ-I scales, a similar transformation was performed based on a randomly selected group of healthy male subjects (n = 196; range 20 to 65 years) from within the greater Stockholm area.[45]

Results

All of the BZ abusers (n = 19) were abusing FZ and were frequent intoxicated by it. The most preferred FZ compound was Rohypnol (at the time of this writing, there are four compounds legalized for medical use in Sweden that include FZ).

Grounded Theory: Why Just Flunitrazepam? The main reason given by our study subjects for frequently being in an advanced state of intoxication with FZ was to obtain an increased feeling of power and self-esteem and to feel that everything was possible (typified by the comments: "This drug does just what I want to change. It is so much stronger, I am able to do everything"; and "My brain is asleep, and my body does as it wants"). All of the FZ abusers had experienced changes in reality, which could vary from person to person and from one occasion to another.

The FZ abusers have no conscience or guilt about serious violent offenses ("When I stabbed him it felt like putting a knife into butter"). Another reported effect was that of being able to achieve a generally calm, "antianxious," and methodical state, which was desirable before committing crimes. Similarly, FZ could be used to achieve a severe disturbance in perceptual and cognitive processes (i.e., 'a black-out'), lasting sometimes up to two weeks and highly practical in conjunction with police inquiries. In contrast to FZ, other BZs were reported to be "dangerous" in combination with alcohol; for example, subjects could experience breathless and palpitations. FZ was also reported to have a lot of "practical" properties; it was possible to take five to six milligrams of this drug still be capable of driving. The majority of abusers also reported that FZ reduced their level of anxiety, whereas other BZs did not exhibit the same anxiolytic effect. The drug was also used to reduce anxiety, often in relation to previous adjustment/punishment, and to avoid having to face up to social norms. Under the influence of the drug it was possible, for example, to rush into an unknown apartment and totally destroy it, wreck cars, or break a shop window. The ability to commit such violent acts was reported desirable when taking the role of "torpedo" (a person who kills or assaults others for money).

In conclusion, it can be construed that all FZ abusers considered the dysfunction of fundamental innate emotional reactions, such as anger, fear, disgust, and sadness as a desirable effect. The following quotations exemplify this attitude: "I didn't feel any emotion, when I stabbed him five times stabs"; "My friend had taken an overdose and died, and I didn't even notice." Such dysfunction, which has been experienced by all FZ abusers, is described as both frightening and highly exciting and is accompanied by a heightened sense of power and self-esteem.

The Extent of Flunitrazepam Abuse The subjects did not describe themselves as "hooked" on FZ. They used FZ for its many "good" effects, which included the practical side in relation to criminal acts. They defined two to six milligrams as a desirable dose of FZ. Alcohol strengthens the effect of FZ. Most of the FZ abusers used FZ only occasionally or when "necessary." Only one of the subjects reported heavy, long term FZ abuse and dependence (20–30 mg of FZ every day during the previous two- to three-year period).

Ways to Obtain FZ The FZ abusers were in the habit of having a lot of FZ on hand (1,000 milligrams was not rare). FZ was obtained in a number of specific ways: the illegal drug market (the reported price was low at 10 to 15 Swedish crowns per milligram, corresponding to $1–2 U.S.); stealing from a pharmacy or from senior citizen apartments; stealing from other drug addicts; and obtaining it from a supplier at parties (reported as frequently available). Only two subjects had been prescribed FZ by their doctors.

Flunitrazepam Abusers and Their Backgrounds The FZ abusers ranged in age from 16 to 20 years and averaged 17.3 years (SD = 1.1 years). The subjects who were non-FZ abusers (n = 28) were used as a comparison group for the purposes of this study and ranged in age from 14 to 20 years (M = 17 ± 1.3 SD). There were no significant differences between subgroups with regard to age.

The results showed that all of the FZ abusers except one had a history of violent behavior. In these cases, the subjects reported using violence in their daily life as a means of communication (typified by the comment: "I say nothing, I just hit"). Almost all FZ abusers also reported having been convicted of *serious* violent offenses including homicide, attempted murder, assault of a serious nature, arson, and armed robbery. In some cases such crimes had been committed several times, and there were also occasions where the crimes had been committed but the subjects had not been caught. Almost all of the FZ abusers had been caught more then three times for their crimes before the age of 15, and approximately 75 percent reported selling drugs as a main source of income.

No significant differences were found between the two subgroups in demographic data or on any of the other background factors (Table 1).

The number of criminal sentences for FZ abusers and non-FZ abusers are shown in Table 2 in relation to the type of crime committed. There were no significant differences between the two subgroups in this respect. Among the FZ abusers, there were also subjects who were alcohol abusers (n = 14). Similarly, there were 16 alcohol abusers among the non-FZ abusers. It was notable, however, that there were no significant differences between the subgroups regarding the type and number of criminal offenses. Also, there were no significant differences as to the type and number of criminal offenses between those subjects who were FZ abusers (n = 19) and those who were only alcohol abusers (n = 16).

Table 1
Comparison of Background Factors (data from structured interviews) for a Group of Juvenile Offenders from Four Swedish Correctional Institutions (n = 47) at age 17 (SD = 1.2)[a]

Background Factors	FZ (n = 19) No. of Subjects	Non-FZ (n = 28) No. of Subjects
Sentenced to violent crimes two or more times[b]	17	16
Family situation		
Biological parents both born in Sweden	6	16
One parent is immigrant	6	2
Swedish-born mother	5	0
Swedish-born father	1	2
Parents both immigrants	6	10
Mother Swedish-born, father unknown	1	0
Sibling(s) criminal	5	4
Sibling(s) unknown, father criminal	2	0
Father addicted to alcohol or drugs	3	4
Mother addicted to alcohol or drugs	1	3
Father criminal	5	2
Father unknown	3	2
Father deceased	1	2
Mother deceased	0	2
Housing Area		
Metropolitan area[c]	10	6
Previously sentenced to be treated in a correctional institution		
One to two times	5	11
Three times or more	13	5
Childhood psychological/psychiatric contact	8	1

[a]The subjects are divided into two subgroups: flunitrazepam abuse (FZ, n = 19) and non-flunitrazepam abuse (non-FZ, n = 28). All BZ abusers were also FZ abusers.
[b]Violent crimes against officials are not included.
[c]Stockholm, Gothenburg, and Malmoe and surrounding counties.

Personality Scale Scores in Flunitrazepam Abusers and Non-Flunitrazepam abusers Mean personality scale scores are presented in Figure 1 in the form of T scores for the KSP sensation-seeking-related monotony avoidance scale and aggression scale. The FZ abusers differed significantly from the non-FZ abusers, displaying higher scores on the verbal aggression scale ($F(1,45) = 8.00$, $p < .01$). In addition, the FZ abusers also showed a tendency toward higher scores on the sensation-seeking-related monotony avoidance scale ($F(1,45) = 2.84$, $p < .10$). The FZ abusers also displayed higher scores on the BS subscale from the SSS-V ($F(1,45) = 5.36$, $p < .05$), as well as tendencies toward higher scores on the ES subscale ($F(1,45) = 3.57$, $p < .10$) and the G scale ($F(1,45) = 3.18$, $p < .10$) in comparison with the non-FZ abusers (see Fig. 2).

There were no significant differences between the two subgroups on the other

Table 2
Number of Offenses[a] (data from official records) for a Group of Juvenile Offenders from Four Swedish Correctional Institutions (n = 47) at age 17 (SD = 1.2)

Type of Offenses	FZ (n = 19) (No. of Subjects)	Non-FZ (n = 28) (No. of Subjects)
Violent offenses[b]	88 (17)	60 (19)
Robbery	11 (7)	6 (4)
Severe violent offenses[c]	4 (3)	4 (3)
Weapons offenses	15 (9)	6 (4)
Theft offenses	110 (15)	250 (22)
Inflicting damage and arson	13 (10)	20 (8)
Narcotic offenses	29 (11)	3 (2)
Traffic violations	27 (7)	37 (7)
Other crimes	22 (13)	20 (12)

[a]Only crimes committed up to the date of interview are reported. The subjects are divided into two subgroups: flunitrazepam abuse (FZ, n = 19) and non-flunitrazepam abuse (non-FZ, n = 28), shown in relation to type of offense.
[b]Severe violent offenses are not included.
[c]Murder, manslaughter, and severe cases of assault.

KSP or SSS-V scales. Both groups, however, showed extremely low levels of socialization as measured by the KSP, each scoring about three SD below the standard population mean. No differences were found for any of the Eysenck scales between the two subgroups. Interestingly, this was true also with regard to the psychoticism scale; in fact, the scores revealed slight tendencies in the expected direction (i.e., the FZ abusers displayed

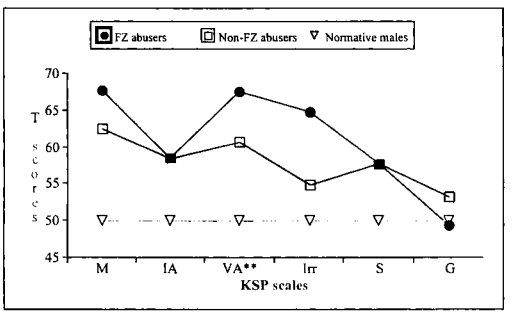

Figure 1. Comparison of mean personality scale scores, presented as T scores for a group of juvenile offenders from four Swedish correctional institutions (n = 47) at age 17 years (SD = 1.2). The subjects are divided into two subgroups: flunitrazepam abuse (FZ, n = 19), and non-flunitrazepam abuse (non-FZ, n = 28). Results from one-way ANOVAs are reported (significance level **, p <.01), along with significant t (5% level) for subgroup comparisons (Scheffé); *M*, Monotony Avoidance; *IA*, Indirect Aggression; *VA*, Verbal Aggression; *IrR*, Irritability; *S*, Suspicion; *G*, Guilt.

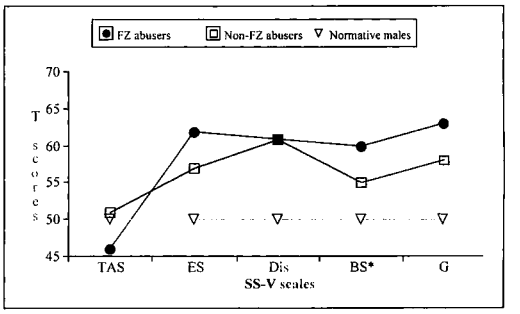

Figure 2. Comparison of mean personality scale scores presented as T scores for a group of juvenile offenders from four Swedish correctional institutions (n = 47) at age 17 (SD = 1.2) The subjects are divided into two subgroups; flunitrazepam abuse (FZ, n = 19), and non-flunitrazepam abuse (non-FZ, n = 28). Results from one-way ANOVAs are reported (significance level *, p < .05), along with significant t (5% level) for subgroup comparisons (Scheffé); *TAS*, Thrill and Adventure Seeking; *ES*, Experience Seeking; *Dis*, Disinhibition; *BS*, Boredom Susceptibility; *G*, General Sensation Seeking Scale.

Table 3
Comparison of Type and Extent of Drug Abuse for Specific Drugs (data from structured interviews) for a Group of Juvenile Offenders from Four Swedish Correctional Institutions (n = 47) at age 17 (SD = 1.2)[a]

Type of Drug	Frequency of Abuse	FZ (n = 19) No. of Subjects	Non-FZ (n = 28) No. of Subjects
Alcohol	Often (and involved in almost all of their own crimes)	14	16
Amphetamine and cocaine (also crack)	Occasionally (parties; maximum 1–2 times per month)	4	3
	Often (1–2 times per week)	3	1
	Every day	7	5
Anabolic steroids	Often; sometimes every day	1	4
Cannabis (hashish and marijuana)	Occasionally (maximum 1–2 times per month)	1	2
	Often (1–2 times per week)	2	1
	Every day	15	6
LSD and ecstacy	Occasionally ("rave" parties; maximum 1–2 times per month)	3	2
	Often (1–2 times per week)	8	3
Opiates (mainly inhaling heroin, referred to as "chasing the dragon")	Every day	10	2

[a]The subjects are divided into two subgroups: flunitrazepam abuse (FZ, n = 19) and non-flunitrazepam abuse (non-FZ, n = 28).

higher scores in comparison with the non-FZ abusers).

The Substance Abuse Pattern in Flunitrazepam Abusers All of the BZ abusers used FZ, and about 30 percent of the FZ abusers (six subjects) used only Rohypnol; the remaining 13 subjects used FZ compounds other than Rohypnol (under the brand names Fluscanol, Flunitrazepam, and Flupam) as well as other BZs such as Diazepam, Oxazepam, or Nitrazepam. Most of the subjects in this subgroup combined FZ with other drugs and alcohol as shown in Table 3. There were, however, no significant differences between the FZ abusers and those who were not FZ abusers and showed a preference for other drugs. About 40 percent of those who abused FZ and amphetamine and/or cocaine were daily amphetamine addicts. About 80 percent of those who abused FZ and were addicted to cannabis and/or marijuana (foremost hashish) were daily cannabis addicts. And about half of those who abused FZ and hallucinogenic drugs, such as LSD and ecstasy, used these drugs regularly, especially in connection with "rave" parties. Some theoretical concepts, together with results regarding the FZ abusers' personality traits and the results from the application of Grounded Theory are presented in Figure 3.

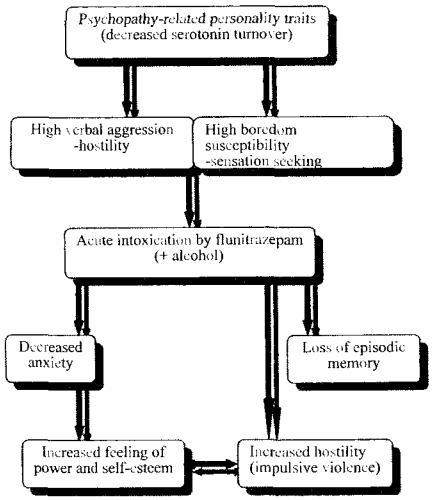

Figure 3. Illustration of a theoretical psycho-pharmaco-biological model, which is supported by present study. Paradoxical rage reactions because of acute intoxication by flunitrazepam would result from a disinhibition phenomenon in the serotonergic mechanism and personality traits, assumed to reflect the biological basis of personality (psychiatric/psychological vulnerability).

Discussion

This study is the first to use in-depth interviews to obtain a greater understanding of the effects of acute intoxication by FZ, particularly when used in combination with alcohol, with regard to outcomes in the form of criminal behavior and enhanced violence.

This study has focused on 19 extreme FZ abusers also known to have severe conduct disorders. All were young male juvenile offenders admitted to Swedish correctional institutions for violent offenses. The comparison group was also recruited from the same institutions. The FZ abusers provided a great deal of in-depth information concerning the effects of FZ that may be highly useful for the staff at correctional institutions, doctors, and other decision-makers (e.g., politicians and judges) to help them understand how the drug functions and the ways in which FZ is obtained.

In Sweden, about 80 percent of BZs are prescribed not by specialist but by primary care physicians who are often unaware of the adverse effects that occur when this drug is abused.[46] One of the major findings of this study was that subjects reported using FZ in an attempt to reduce insecurity and anxiety. The FZ abusers also reported a loss of episodic memory, which has also been found in earlier research. George and Dundee[47] found that FZ dose-related amnesia lasted slightly longer than that associated with diazepam. The amnestic effects produced by FZ may be desirable in the clinical setting but not in offenders. When FZ is used as a presurgical medication, the amnestic effects tend to diminish the unpleasant memory related to surgical procedure. The present study showed that memory loss allowed FZ abusers to forget experiences of earlier violent acts, consequently influencing their behavior. The drug could be used effectively by violent offenders to avoid having a guilty conscience and to provide a useful loss of episodic memory when faced with inquiries.

The findings of this study suggest that three of four FZ-abusing subjects suffered from Type 2 alcoholism. A biochemical basis of alcoholism and impulsivity in Type 2 alcoholics may be attributable to a low turn-over of CSF monoamine transmitters. FZ has also been noted to reduce serotonin turn-over.[48,49] Used together with alcohol or other drugs, FZ is reported to have devastating consequences

leading to behavior that is more consistent with wild animals. FZ abuse can be directly linked to violent assaults and acts of murder. This association may be especially strong in impulsive subjects.

No subgroup differences were found between the FZ abusers and the non-FZ abusers regarding the type and number of offenses committed, which may be due to the fact that almost 75 percent of the BZ abusers had previously been retained within correctional institutions more than three times. Obviously, the subjects were unable to commit further offenses during their confinement. Only about 20 percent of the subjects from the comparison group had been previously sentenced to be treated in correctional institutions three times. Furthermore, a close inspection of the information given by the subjects regarding violence, in conjunction with the data obtained from official sources, indicated that many of the violent crimes remained undiscovered by official authorities; this explains why it was not possible to adequately investigate the effect of FZ on the severity of criminal offenses in terms of the sentences in each subgroup.

As stated previously, there are few case reports to date relating specifically to FZ abuse that describe patterns of behavior and evidence of criminality. The experience of power and overwhelming self-esteem in FZ abusers appears to be a pharmacological effect but appears also to depend on the predisposing personality. Tiihonen and coworkers[50] found that the probability for committing a violent offense was enhanced 80 times when there was a coexisting personality disorder in conjunction with substance abuse. The subjects in Tiihonen and coworkers'[50] study were diagnosed with organic psychosis, had criminal records, and were abusers of alcohol.

The FZ abusers in the current study belonged to a group of severely conduct-disturbed young male juvenile offenders. They scored very high on core psychopathy-related traits, such as impulsivity and sensation seeking and somatic anxiety, and scored low on conformity (i.e., socialization).[29, 30] Based on these facts, it seems possible that FZ acts as a tranquilizer by increasing hostility in vulnerable subjects, leading to a calmer state and reducing the level of anxiety. It is interesting that subjects displayed higher scores on sensation-seeking scales, especially the boredom susceptibility scale, which reflects a dislike of routine activity, of dull/boring people, and of an environment that does not change. Furthermore, the FZ abusers also scored high on the verbal aggression scale, reflecting a readiness to enter into arguments following minor provocations, a tendency to berate people when annoyed, and the frequent use of swear words.

The violence of FZ abusers was both severe and commonplace. All of the studied FZ abusers except one were recidivists, and all had committed serious crimes of violence. All except one of the subjects had been treated on psychiatric wards or in correctional institutions several times, 75 percent of the subjects on three or more occasions. This frequency implies that the subjects had been within the correctional system for many years. Most subjects had been subjected to

environmental therapy, but only one of the institutions used in the study had the possibility to offer cognitive behavior therapy.

A number of WHO case reports based on both male and female subjects have indicated that FZ causes a state of hostility in men, and memory loss in both men and women. Those case reports did not, however, include information about whether the subjects were also abusing alcohol in addition to FZ. The abuse of FZ together with alcohol use is reported to be commonplace among Swedish juveniles. At the time of this writing, FZ is the most popular compound among Swedish drug abusers.[51] This may have something to do with the fact that juveniles read the pharmacy compendium.[52] The pharmacy compendium, openly available at pharmacies in Sweden, describes the adverse effects of FZ and the fact that FZ strengthens the effect of alcohol. Recently, there have been reports in Swedish newspapers describing some very severe cases of murder, assault, robbery, and kidnapping that were "calmly" carried out by both juvenile delinquents and adults while under the influence of the FZ drug.

Our study indicates that FZ is the drug of choice among Swedish juvenile delinquents, and there are reports to suggest that it can cause violence. Presently, it is easy for youths and older abusers to obtain FZ on the illegal drug market. Aggressive behavior resulting from the use of FZ is becoming more widely recognized in Sweden. This fact alone would suggest that the prescription of FZ in Sweden should be restricted. The Swedish government should reclassify all FZ compounds as drugs similar to heavy narcotics. Although the effect of long term FZ abuse has not been systematically studied, the results of the present study provide some suggestions about the short term effects of FZ abuse in a violent population. Once the positive effects of FZ have been experienced by young male offenders, they usually wish to reexperience these effects and often take FZ purposefully before committing violent offenses.

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