Multisubstance Intoxication Among Schizophrenic Inpatients:
Reply to Hyde

by Andrzej B. Koczapski, Barry Ledwidge, Jaime Parades, Claudio Kogan, and John Higenbottam

Abstract

The authors describe intoxication-related behavior patterns observed among 89 chronic schizophrenic inpatients over a 5-year period. These include caffeine intoxication, water intoxication, antihistamine intoxication, nicotine withdrawal, voluntary hyperventilation, and ingestion of deodorants and aerosols. Affected patients tended to abuse multiple substances in the hospital, to have generalized polydipsia, and to have histories of drug or alcohol abuse before hospitalization. Periodic intoxication in this population may be an important contributor to the refractoriness of their psychotic symptoms.

We had initially surveyed the coffee-drinking habits of 100 schizophrenic men on four chronic wards and identified the 18 highest caffeine consumers and the 15 lowest caffeine consumers (Koczapski et al. 1989b). Five years later, 89 of these patients remain in hospital. During this time we have become increasingly aware of individual patterns of intoxication involving both caffeine and other substances.

Clear-cut caffeine intoxication occurred in 3 of the 89 patients. It was most common every second Friday afternoon, which was payday from their hospital work placements. After work, they rapidly drank four to six cups of coffee at the hospital coffee shop, and then drank a 50:50 mixture of powdered coffee and lukewarm tapwater on the wards. They also sometimes made a thick "coffee paste" with small amounts of tapwater directly in the palms of their hands, or ate handfuls of freeze-dried coffee granules which they carried around in their pockets. Symptoms were worst between 5 and 9 p.m. and included restlessness, irritability, suspiciousness, and agitation. When not intoxicated, these patients consumed "moderate" amounts of coffee, and were not members of the highest or lowest caffeine consumption subgroup. Interestingly, each of the three patients had a history of alcohol abuse before hospitalization. Each also subsequently developed periodic water intoxication, with serum sodium levels of 128-122 meq/l.

We thank Dr. Hyde for his clinical descriptions of caffeine intoxication (Hyde 1990, this issue), and for his supportive comments about our study (Koczapski 1989b). We agree that caffeine intoxication is an important cause of disturbed behavior in some chronic schizophrenic inpatients.

We suggest, however, that caffeine is only one of several causes of periodic intoxication in this population. In addition to the clinical subgroups described by Dr. Hyde, there are probably several other subgroups of chronic schizophrenic inpatients who vary in their response to caffeine and in their use of other intoxicants. Differences in the proportions of these subgroups may be one reason for differences in the outcome of caffeine-restriction studies. We welcome the opportunity to describe the prevalence, clinical appearance, and possible interrelation of the intoxication-susceptible subgroups we have observed among our patients.

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Four other patients showed coffee-eating behavior, but did not develop intoxication symptoms.

Another subgroup may have worsened with decaffeinated coffee, although this evidence is indirect. At the end of the caffeine study, we received a phone call from the manager of the hospital coffee shop expressing relief that the study was over. She reported that several patients had complained loudly about the "taste" of the coffee during the two decaffeinated periods and had become increasingly intrusive, belligerent, and disruptive during these periods.

Episodic water intoxication developed in 18 patients. They showed generalized polydipsia with periodic behavior changes associated with drops in serum sodium levels to between 131 and 102 meq/l. Symptoms ranged from euphoria, restlessness, and social disinhibition to property damage (four patients), staff assaults (three patients), falls and fractures (two patients), seizures (seven patients), and coma (two patients). Frequency ranged from yearly (six patients) to almost daily (five patients). Fifteen of these patients reported that they drank water to "feel good" or to "get high" (Millson et al. 1989).

Eight of these patients were from the original group of highest caffeine consumers, and none were from the group of lowest caffeine consumers. This distribution was highly significant ($\chi^2 = 12.24$, df = 2, $p < 0.01$). It suggests that high coffee intake may be related to the subsequent development of water intoxication. A relationship with prior alcohol abuse has also been reported (Ripley et al. 1989).

Compared to caffeine intoxication, water intoxication affected more patients, occurred more frequently, and produced more severe symptoms. This is ironic in view of the recommended treatment for caffeineism: "...substitution of decaffeinated beverages and the encouragement to consume water when thirsty improves outcome" (Greden 1985). Clearly, this advice should be applied cautiously, if at all, to chronic schizophrenic inpatients.

Intoxication with antihistamines occurred in five patients. They swallowed 10 to 20 tablets at a time, which they obtained by purchase or shoplifting. The choice of antihistamine was very consistent—tripelennamine (Pyrizbenzamine) in four patients and dimenhydrinate (Gravol) in one patient. Symptoms ranged from euphoria, irritability, and drowsiness to stupor and delirium. These patients seemed to be a distinct subgroup which did not overlap with either the high caffeine consumption or water intoxication group. They were younger (late twenties vs. thirties and forties), and three had histories of street drug use before hospitalization.

Four patients showed periodic voluntary hyperventilation. They typically took 8-20 deep, rhythmic, loud, forced inspirations and expirations at a rate of about one per second, followed by forced expiration and a period of apnea lasting 5-10 seconds. This occurred in clusters of up to several times an hour, interspersed with periods of abstinence of up to several weeks. It was more frequent during periods of restless and increased psychosis, but the cause-and-effect relationship was unclear. One patient lost consciousness during one of these episodes. Two became briefly dizzy and ataxic. The stated reason for this behavior was "to relax." Each of the four patients had histories of both drug and alcohol abuse before hospitalization. All had polydipsia, and two were from the high caffeine group. None had respiratory dyskinesia.

We are not aware that this phenomenon has been previously reported. Although we hesitate to go quite so far as to label it "air intoxication," we suspect that it may well be associated with hypocarbia, respiratory alkalosis, and a subjective change in mental state. It would be informative, but impractical, to obtain arterial blood gases before and after a hyperventilation episode.

Eighty-seven of the 89 patients met criteria (Greden 1985; American Psychiatric Association 1987) for nicotine dependence and withdrawal. This was particularly noticeable in a subgroup of about 25, who spent much of their day searching for extra tobacco. Techniques used included the following: smoking each cigarette right down to the end, without regard to burned lips or fingers; smoking two or more cigarettes at once; collecting discarded butts; trading clothing or personal articles for cigarettes; theft; and intimidation of weaker patients. Temporary drops in the cigarette supply were followed by restlessness, irritability, outbursts of violence, or the smoking of alternate substances such as leaves and paper towels. In some patients, we found prescribing cigarettes in certain situations to be safer and more effective in preventing disturbed behavior than prescribing neuroleptics.

Fourteen patients showed other potentially intoxicating behaviors. These were usually well developed at the time of discovery, suggesting they had probably been occurring for some time without staff knowledge. Twelve patients drank inappropriate fluids, including shaving...
lotion, shampoo, deodorant, disinfectants, lighter fluids, fire extinguisher fluids, and paint supplies. Five patients squirted aerosol room deodorizer into paper cups and drank the residue. One patient attempted to melt down his under-arm stick deodorant and drink it from a spoon. One patient became belligerent after inhaling gasoline fumes. Two patients ate mushrooms they found on the hospital grounds, in the hope they might be “magic.” Most of these patients also had polydipsia, high coffee consumption, and past histories of alcohol abuse.

We suggest that intoxication among chronic schizophrenic inpatients occurs much more commonly than is generally realized. It may explain why some patients do so poorly out of the hospital, or why their symptoms seem so refractory to neuroleptics. A history of drug and alcohol use or the presence of concurrent polydipsia may help identify some patients at risk. A method for indirect measurement of polydipsia has recently been described (Koczapski et al. 1989a). Water intoxication as a cause of acutely disturbed behavior can be ruled in or out by measuring changes in body weight (Koczapski et al. 1989b).

Chronic schizophrenic patients probably become intoxicated for several reasons. Some may ingest inappropriate substances through poor judgment associated with their illness. Others may deliberately “self-medicate” in an attempt to escape from subjectively unpleasant aspects of their illness or from medication side effects such as akathisia. Some subgroups may be biologically predisposed to certain types of intoxication. Caffeine supersensitivity has been suggested by Dr. Hyde. Other authors have postulated supersensitivity to antidiuretic hormone (Goldman et al. 1988) or to the antidiuretic hormone-stimulating effect of nicotine (Blum 1984).

We agree wholeheartedly with Dr. Hyde’s comment that this is an “important but confusing” area. Further studies are needed to clarify the prevalence and clinical significance of intoxication-susceptible subgroups among chronic schizophrenic patients.

References


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