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Although there has been some organized illicit manufacturing of amphetamines in the United States since World War II, almost all of the amphetamines found in the street market a decade ago were manufactured by legitimate commercial drug houses and then illegally diverted into street distribution. Although these products were of several different colors, sizes, and physical shapes, each was recognizable and of uniform content of active ingredient since each had a uniform content of active ingredient since each was recognizable and a relatively safe and predictable product. In 1972, practically all bulk diversions from legitimate commercial drug houses were stopped. In 1972, practically all bulk diversions from "ethical" procedures were rarely followed, because such procedures require experts and cost money. Obviously the FDA had no part in guaranteeing these products even indirectly. The production manager was often an amateur. The manufacturer tried hard to remain completely anonymous, yet move his product as rapidly as possible.

In a recent issue of the Pacific Information Service On Street-Drugs (1), it was reported that only 60% of 300 samples alleged to be amphetamines contained any amphetamine. Two percent were amphetamine-barbiturate mixtures—a combination whereby the barbiturate tends to cancel out the desired amphetamine euphoria. Five percent contained non-euphoriant amphetamine-like agents or mixtures, and 28% contained no "speed" component at all. Only 4% of the amphetamine samples were of uniform strength and also one amphetamine-saliclylate mixture (about 5%. active ingredient per tablet). These samples were assayed by our laboratory, PharmChem Laboratories (Palo Alto, Calif.), Los Angeles County-USC Medical Center, and Metro Drug Awareness (Minneapolis, Minn.). Table I restates this data, and compares it with the quality of street amphetamines. The tablets are quite recognizable (two scorings on one of the flat surfaces intersect to form a cross), and since they appear quite uniform to the naked eye, it is a widely held street belief that they are uniform in regard to the amount of active constituent per tablet. A brief 1972 report in the Los Angeles Free Press indicated that this might not be the case (2). The data presented in Table II were abstracted from our findings presented recently before the Western Pharmacology Society (3) and represent the quality of street amphetamines sold during the last four months of 1973. Only "white cross" formulations were assayed. These tablets in Table II are formulations that would have been judged "good amphetamines" by the standards applied in Table I. The tablets ranged in weight between 30 - 62 milligrams per tablet and were quite recognizable. Two percent of the samples actually contained no amphetamine. Two percent of the samples were amphetamine-barbiturate mixtures. Five percent contained non-euphoriant amphetamine-like agents or mixtures, and 28% contained no "speed" component at all. These samples were assayed by our laboratory, PharmChem Laboratories (Palo Alto, Calif.), Los Angeles County-USC Medical Center, and Metro Drug Awareness (Minneapolis, Minn.). Table I restates this data, and compares it with the quality of street amphetamines. They are becoming one of the most profitable of the street drug rip-offs.

However, the data in Table I really only indicate the obvious part of the street amphetamine problem. Using data collected in our lab during the last quarter of 1973 and some data borrowed from the Los Angeles County-USC Medical Center, this bulletin will try to define a more subtle problem associated with consumption of those street amphetamines that really contain amphetamine and only amphetamine -- these are the amphetamines in Table I that appear to be "good amphetamines" and, therefore, appear to be "safe" to use.

The most common forms of street amphetamine are called "white crosses" or sometimes "mini-bennies." Since these small round white tablets are quite recognizable (two scorings on one of the flat surfaces intersect to form a cross), and since they appear quite uniform to the naked eye, it is a widely held street belief that they are also uniform in regard to the amount of active constituent per tablet. A brief 1972 report in the Los Angeles Free Press indicated that this might not be the case (2). The data presented in Table II were abstracted from our findings presented recently before the Western Pharmacology Society (3) and represent the quality of street amphetamines sold during the last four months of 1973. Only "white cross" formulations were assayed. These tablets in Table II are formulations that would have been judged "good amphetamines" by the standards applied in Table I. The tablets ranged in weight between 30 - 62 milligrams per tablet and were quite recognizable. Two percent of the samples actually contained no amphetamine. Two percent of the samples were amphetamine-barbiturate mixtures. Five percent contained non-euphoriant amphetamine-like agents or mixtures, and 28% contained no "speed" component at all. These samples were assayed by our laboratory, PharmChem Laboratories (Palo Alto, Calif.), Los Angeles County-USC Medical Center, and Metro Drug Awareness (Minneapolis, Minn.). Table I restates this data, and compares it with the quality of street amphetamines. They are becoming one of the most profitable of the street drug rip-offs.

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TABLE II. -- AMPHETAMINE CONTENT OF LEGITIMATE AND "WHITE CROSS"

STREET FORMULATIONS USING ULTRAVIOLET SPECTROPHOTOMETRIC ANALYSIS (3)

<table>
<thead>
<tr>
<th>Identification/Source</th>
<th>Number of Samples Tested</th>
<th>Average Tablet Weight (Observed Range)</th>
<th>Average Amphetamine Content Per Tablet (Observed Range)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Legitimate Dexedrine/ SKF 5-mg. Tablet</td>
<td>12</td>
<td>28 mg. (26 - 30)</td>
<td>5.2 mg. (4.8 - 5.7)</td>
</tr>
<tr>
<td>Crosses/Stockton, Calif. Area</td>
<td>32</td>
<td>51 mg. (44 - 62)</td>
<td>5.3 mg. (2.6 - 8.0)</td>
</tr>
<tr>
<td>Crosses/Los Angeles, Calif. Area</td>
<td>11a</td>
<td>49 mg. (30 - 61)</td>
<td>4.3 mg. (2.7 - 7.1)</td>
</tr>
<tr>
<td>Crosses/Santa Cruz, Calif. Area</td>
<td>10</td>
<td>49 mg. (44 - 58)</td>
<td>3.6 mg. (2.0 - 5.0)</td>
</tr>
<tr>
<td>Crosses/Bellingham, Washington Area</td>
<td>9</td>
<td>50 mg. (43 - 57)</td>
<td>3.0 mg. (1.0 - 5.1)</td>
</tr>
<tr>
<td>Crosses/San Francisco, Calif. Area</td>
<td>3</td>
<td>41 mg. (40 - 43)</td>
<td>1.8 mg. (1.7 - 2.0)</td>
</tr>
<tr>
<td>Crosses/All Areas Above</td>
<td>65</td>
<td>50 mg. (30 - 62)</td>
<td>4.4 mg. (1.0 - 8.0)</td>
</tr>
</tbody>
</table>

a Data courtesy of Los Angeles County-USC Medical Center (June-November, 1973).

milligrams per tablet with the amphetamine content ranging from 1 - 8 milligrams per tablet. There was no statistically significant correlation between tablet weight and tablet amphetamine content (i.e., the heavier tablets did not contain more amphetamine just as the lighter tablets did not contain less amphetamine). However, there were distinct real differences in potency associated with the locality of distribution -- tablets from Santa Cruz, Bellingham, and San Francisco being statistically less potent than tablets collected in the Stockton area. In addition (not shown in Table II), three samples from Santa Cruz, two from Los Angeles, and one from Western Washington contained no measureable amphetamine. These six samples ranged in weight from 44 - 50 milligrams per tablet and each was positive for caffeine. Los Angeles County-USC Medical Center has reported on two samples that were negative for amphetamine and positive for caffeine -- the caffeine content ranged between 22 - 51 milligrams per tablet (tablet weight ranging between 42 - 59 milligrams per tablet). One "white cross" sample from the Stockton area weighing 54 milligrams contained no active ingredient whatsoever.

The legitimate drug manufacturer selected for this study produced amphetamine tablets with a very narrow range between low and high values in regard to tablet weight (only 4 milligrams) and in regard to amphetamine content (0.9 milligrams). This is an indication of good quality control in manufacturing and produces a uniform product worthy of being used as a prescription item by medical people. While all of the "crosses" in Table II appeared grossly identical, they had a wide range between the low and high values in regard to tablet weight (32 milligrams) and amphetamine content (7.0 milligrams). On top of that, certain "crosses" contained only caffeine and one "cross" formulation contained no active ingredient whatsoever. Such data indicate a complete lack of quality control.

As was pointed out in Vol. 2, no. 2 of Pacific Information Service on Street Drugs (4), three tablets of a low potency tablet may just be the right amount to produce the euphoria and feelings of confidence the user desires. However, if this consumer gets a high potency tablet and again consumes his usual three tablets, a toxic reaction may be precipitated -- a reaction difficult to manage without medical help. Such an excess would not be fatal (5), and might not be noticeably toxic if the individual was accustomed to taking amphetamines regularly. However, even in a chronic user the potential for a severe emotional crisis would be increased drastically if the individual were placed in a stressful situation. This crisis would generally take the form of an aggressive paranoiac reaction.

One can illustrate easily this subtle amphetamine toxicity using common laboratory animals (6-12). After selecting 20 healthy white mice, each one is injected with a single dose of amphetamine and then each is placed in an individual cage away from the others and away from stressful noises, bright lights, etc. Nothing much happens to these mice except a lack of appetite and an inability to take their usual round of naps. They look alert, bright-eyed, and grossly normal. The drug wears off. To a second group of 20 healthy white mice (using animals of the same stock, the same age, the same sex, the same weight, the same means of injection, etc.), each one is injected with the same dose of amphetamine used for the first group. However, the second group of mice are all housed together in a single, well illuminated cage. The mice soon become restless and agitated. Fine body tremors appear. Aggressive outbursts are made toward others and fight sprout. Coarse body tremors are seen. Eyes bug out! Beserk reactions! Spontaneous convulsions begin to break out and eventually all die. No survivors.

The stress in this experiment is very slight -- just the proximity of others. Greater stress situations produce similar reactions. While humans don't die acutely when taking a larger than usual dose of amphetamine, some pretty weird behavior can result when such a human is placed under stress. Apparently, amphetamine sets up the psyche in such a way that even a modestly stressful situation can trigger a reaction very akin to that seen in "mass hysteria" where a lot of "normal" people react emotionally and without their usual deliberate logic. Predictably, the people in the Pentagon are presently interested in these incapacitating potentials of the amphetamines and their chemical relatives. The second group of mice and
humans can be protected from this subtle form of amphetamine toxicity by small doses of chlorpromazine — a tranquilizer. This very predictable manifestation of moderate amphetamine overdosage during stress is not generally appreciated by street people, indiscriminate drugtasters, and Mr./Mrs./Ms. Citizen (with legitimate prescriptions). This effect explains the high accident rate documented by the insurance companies for truckers who insist on taking amphetamines to stay awake on long hauls. It is difficult to drive a heavy truck through modern traffic without some degree of stress.

Most street people into drugs, however, do know that regular heavy amphetamine use (especially when mainlining) eventually will result in a true schizophrenic-like "break out." Anyone wanting an easily read, reasonably honest discussion of the schizophrenia-producing capacity of the amphetamines can read Snyder's article in the January, 1972 issue of Psychology Today — available in most public libraries (13).

In conclusion, "amphetamine" frequently may not contain amphetamine. Even when they do contain it, they rarely have the correct milligram dosage. The amount per tablet presently cannot be predicted by its appearance or by its weight — only chemical analysis can give this information. Street amphetamine is not guaranteed by the FDA. Formulations such as the popular "white crosses" are manufactured only for profit to take advantage of the demand. Any two- to three-fold overdosage can cause an emotional "break out" if the individual is placed in a stressful life situation. Continued regular dosage with amphetamine will eventually produce schizophrenic-like reactions — higher than normal daily dosage merely will hasten the onset of this state.

Although now quite out-of-date, Margaret Kreig's book Black Market Medicine is still worth reading as it gives one a reasonably honest look at the early formative years of the street drug manufacturers specializing in amphetamines (14).

-- John A. Byrne and Marvin H. Malone

March 1, 1974

REFERENCES:


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If any of our readers would like a complete reprint of the paper presented at the 30th International Congress on Alcoholism and Drug Dependence (Section B-3, The Analysis of Illicit Drugs) September 6, 1972 in Amsterdam, please drop us a card.


Dr. J. K. Brown is currently in Europe and will be there through July 17th, 1974. Correspondence can be addressed to him directly at: Gerrit van der Veen Straat 75 111, Amsterdam, The Netherlands.

Requests for reprints (such as above), back issues, subscriptions, letters to the editor, general correspondence, etc. should be directed to Dr. M. H. Malone, Department of Physiology-Pharmacology, School of Pharmacy, 751 Brookside Road, Stockton, Calif. 95211, U.S.A. The only back issues presently available are Vol. 2 No. 4 (the "cocaíne" issue) and Vol. 3 No. 3 and Vol. 3 No. 4 (the Amsterdam conference papers on the analysis of controlled substances): plus Vol. 3 No. 1 (the survey issue on street drug quality). Only a very limited number of these back issues are available.

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