Narcosynthesis Effects of Sodium Amytal, Methedrine and L. S. D-25

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L.S.D-25, a derivative of ergot, is a d-lysergic-acid-diethylamide, a synthetically manufactured amide of the organic d-lysergic acid with a secondary amine, diethylamine. As it is difficult to dissolve in water, it is used in the form of soluble tartrate. In the original publication by W. A. Stoll, the drug was termed "A phantasticum of the ergot group." The reason for this somewhat eccentric name, may be found in the effects which accidental inhalation of the drug had on the chemist, Dr. Hoffman. This is his description: "In the middle of the afternoon, I had to interrupt my work in the laboratory and return home as I had been overcome by a slight dizziness. At home, I went to bed and sank into a not unpleasant state of intoxication which manifested itself in an extremely stimulated phantasy activity. In this twilight state, with my eyes closed (I perceived the daylight as unpleasantly glaring), fantastic images with a marked relief quality and with an intensive kaleidoscopic play of colors, acted upon me. After approximately two hours, this state passed." (W. A. Stoll: Lysergsäure-diäthylamid, ein Phantastikum aus der Mutterkorngruppe. Schweizer Archiv für Neurologie und Psychiatrie, Band LX, 1947.) Having some doubt that he could have inhaled a sufficient amount to cause those reactions, Dr. Hoffman took 250 of d-L.S.D. in a watery solution. This self-experiment produced effects similar to those just described. On the basis of this report, the drug appeared promising as a possible aid in narcosynthesis.

Methedrine, commonly known as Pervitin, is a d-n-dimethyl phenethylamine hydrochloride. As a potent stimulant of the central nervous system, according to studies in different places, including our own, this drug, too, seemed likely to contribute to methods of narcosynthesis.

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The well known narcosynthesis effects of Sodium Amytal were tested on our patients for the purpose of obtaining data under conditions as similar as possible and therefore reasonably valid for comparison.

The three drugs were used in the same 20 cases with the following diagnoses: Manic Depressive Reaction, Manic Type, 1; Schizophrenic Reaction, Catatonic Type, 8; Schizophrenic Reaction, Catatonic and Paranoid Tyes, 2; Schizophrenic Reaction, Paranoid Type, 1; Schizophrenic Reaction, Hebephrenic Type, 3; Schizophrenic Reaction, Catatonic and Hebephrenic Types, 1; Schizophrenic Reaction, Chronic Undifferentiated Type, 1; Involutional Psychotic Reaction, 1; Psychoneurotic Reaction, Mixed Type, 2. Out of fifteen schizophrenic patients, 8 were completely mute; 7 would not talk spontaneously and would answer questions only with "yes" or "no," "I don't know," "I forgot."

Procedure:

Any significant abnormalities in the physical or laboratory examinations were regarded as contraindications. Immediately before the administration of any of the drugs, the following physiological and psychological reactions were noted: Color of the skin, pupils, reflexes, spontaneous personality reactions and those evoked in short interviews.

Dosage: Methedrine was administered intravenously, from 5 to 20 mgm; 10 to 15 mgm seemed to be most effective. The drug was administered 2 or 3 times, at intervals of 3-5 days or longer. In order to facilitate the intravenous administration of the drug in the appropriate dosage, we diluted the 1 cc ampule, containing 20 mgm of the drug, with 3 cc of distilled sterilized water, used for i.v. injections.

The physiological and personality reactions, spontaneous reactions and those obtained in interviews, were noted for one hour following the injection.

Sodium Amytal, in accordance with the usual procedure, was given intravenously from 0.3 to 0.5 gm. in each patient once. The patient's reactions, both physiological and psychological, were observed during and one hour after the injection.

L.S.D-25 is furnished in 1 cc ampules, each ampule containing 0.1 mgm (0.0001 gm) of the active substance. The contents of the ampule was diluted with 9 cc of distilled water to comprise an oral solution, 1 cc of which contains 0.01 mgm (0.00001 gm. or 10 gamma). The oral solution should be made and stored in a dark glass bottle; it should not be used beyond the third day after preparation. The dosage, given orally varied from 1 cc to 5 cc (10 to 50 gamma); 2.5 to 4.5 cc (25 to 45 gamma) appeared to be most effective. The patient's physiological and personality reactions, again spontaneous ones, and those elicited in interviews, were noted within two or three hours after administration of the drug.

TABLE 1:

Physiological Reactions in 20 Schizophrenic Patients

	Color of Skin	*Pupils*	*Knee Reflexes*	*Pulse*	*Respiration*	*Blood Pressure*
METHEDRINE:	Flushing or Mildly cyanotic	Dilated	More active	Increased up to 28	Normal or increased	Raised 20-50 mm
SODIUM AMYTAL:	normal or flushing or mildly cyanotic	normal or contracted or slightly dilated	less active	usually decreased; increased with strong emotional reactions	no change	lowered 12-40 mm
L.S.D-25:	flushing pale in 2 patients	dilated	more active	increased 8-32	usually increased	raised 22-50 mm

TABLE 2:

Emotional Reactions Following Administration of the Drugs to the Same 20 Patients

	Methedrine	*Sodium Amytal*	*L.S.D-25*
1—Inappropriate giggling, laughing or euphoria:	5	4	9
2—Negativistic, hostile or threatening:	2	3	1
3—Relaxed, pleased, or friendly:	7	5	3
4—Depressed, tearful, sighing or weeping:	4	2	6
5—Dazed, preoccupied, or drowsy:	2	6	1
Total	20	20.	20

TABLE 3:

Talking Spontaneously or in Answering Questions Following Administration of the Drugs to Same 20 Patients

	Mute Patients—9	*Relatively Mute Patients—6*	*Average or Above—4 Average Talking:*	*Reticent to Talk—1*
SODIUM AMYTAL:	Adequate 7 Mild 1	Adequate 5	No significant change 2 Increase 1	
	Remained mute 1	Remained mute 1	Decrease 1 (Hypertalkative before drug)	Increase
METHEDRINE:	Adequate 5 Mild 1	Adequate 6	No significant change 3	
	Remained mute 3		Increase 1	Increase
L.S.D-25:	Adequate 4 Mild 1	Adequate 3	No significant change 2 Increase 1 Decrease 1	
	Remained mute 4	Remained mute 3	(Hypertalkative before drug)	Increase

Discussion

TABLE 1 summarizes the physiological reactions.

These reactions indicate that the three drugs affect both the autonomic and the cerebrospinal nervous system. Methedrine and L.S.D. provoke predominantly sympathetico-tonic reactions. The sedative effect of Sodium Amytal appears to manifest itself on the physiological level in a relative parasympatheticotonia and in diminution of the reactivity of the cerebrospinal nervous system.

The psychological reactions, subdivided into emotional reactions, spontaneous verbal production and that obtained in interviews, are as follows: Emotional ventilation (Table 2) was provoked by either of the three drugs; it was most marked with L.S.D.; less with Methedrine, and still less with Sodium Amytal. Verbal production, (Table 3) spontaneous and in response to questions, increased in 14 cases and did not change in 6 cases with Methedrine; it increased in 15 cases, decreased in 1 and did not change in 4 with Sodium Amytal; it increased in 10 cases, decreased in 1 and did not change in 9 with L.S.D.

The three drugs failed to provoke verbalization in one and the same mute patient who showed intense ventilation of emotions (laughing, giggling, gesturing).

We found a consistent relationship between verbal production and changes in the blood pressure; with Methedrine and L.S.D., increased verbalization was associated with increased systolic blood pressure, from 20 to 50 mgm of mercury; with Sodium Amytal, increased verbal production was associated with fall in the systolic blood pressure, from 20 to 40 mgm of mercury.

The general content of the patients conversations consisted of: delusions or auditory hallucinations of being accused and, therefore, feeling guilty, deserving punishment or being punished; successes and disappointments in love affairs; sexual experiences and fantasies; domestic difficulties; experiences in the military service; general information to a considerable extent. The experiences included more or less remote happenings,

genuine, or more or less distorted or entirely delusional happenings. The content varied in different patients and in the same patients at different times of testing, but, apparently it did not depend significantly on the kind of the drug administered.

Advantages and Disadvantages of the Drugs Sodium Amytal:

Advantages: 1—Because of its sedative effect, it is the drug of choice in uncooperative or excited patients. 2—Since it reduces blood pressure, it is most appropriate in patients with high blood pressure. 3—Like the other two drugs, it provokes marked ventilation of emotions.

Disadvantages: 1—Not infrequently the twilight state cannot be maintained: the patient may fall asleep too rapidly. Its effect may, therefore, be of too short a duration for obtaining sufficient material. 3—The patient may recall relatively little of the elicited material.

Methedrine:

Advantages: 1—The effect of the drug lasts for several hours and the patient remains awake. 2—There is, therefore, greater opportunity for the patient to ventilate his emotions and to bring forward material, either spontaneously or in the interviews. 3—The patient usually feels better. The performance, therefore, is apt to contribute favorably to doctor-patient relationship.

Disadvantages: 1—Because of its effect on the blood pressure, it is preferable not to use it in patients with hypertension. 2—A minor disadvantage is that its administration should be limited to the forenoon hours; otherwise, it may disturb the patient's night sleep.

Possible Untoward Effects: Headaches 2 cases; precordial discomfort 1 case; dizziness 1.

L.S.D-25:

Advantages: 1—The drug has no odor and no taste; its oral administration is, of course, the easiest. 2—The stimulating effect of the drug makes the patient feel better. 3—The effects of the drug are of longer duration than with Sodium Amytal. 4—When the effects of the drug wear off, the patient recalls what he said while he was under its influence.

Disadvantages: 1—If the patient is uncooperative, it is impossible to administer the drug, as it is given orally. 2—It is contraindicated in hypertension. 3—The test has to be repeated several times because the individual sensitivity towards the drug varies. One, therefore, begins with a small dose; according to the patient's reactions the dose is increased at successive tests until the optimum dose is reached, without provoking severe physiological reactions.

Possible Untoward Effects: Abdominal discomfort in 3 cases; tremor in 2 cases; ataxia in 1 case.

Summary and Comment:

Sodium Amytal, Methedrine and L.S.D-25, studied in the same 20 patients and under the same conditions, have proven their effectiveness in narcosynthesis.

The physiological reactions of Methedrine and L.S.D-25 are similar and preponderately sympatheticotonic. Those of Sodium Amytal are predominantly parasympathicotonic.

Ventilation of emotions appears to be more marked with L.S.D. than with either Methedrine or Sodium Amytal. Since the effects of Methedrine and L.S.D-25 last considerably longer than those of Sodium Amytal, there is greater opportunity for the patient's ventilation of emotions and for verbal production.

Because of the hypertensive effects of Methedrine and L.S.D-25, and the rather hypotensive effect of Sodium Amytal, the latter drug is to be preferred in patients with high blood pressure.

The method of administering L.S.D-25, namely, by mouth, makes this drug eminently valuable in most patients who would rather not subject themselves to intravenous injections.

Each of the drugs offers advantages and has disadvantages sufficiently marked to determine the preference of drug to be used on a given patient under specific conditions.