Inward the Mind's I: Description, Diagnosis, and Treatment of Acute and Delayed LSD Hallucinations

In staccato fashion, internally generated sensory perceptions occur at a rate of up to 20 hallucinations/distortions per minute.

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LSD is a drug capable of unique and complex effects. It creates multiple distortions and hallucinatory experiences encompassing all senses. These experiences may be altered independently or they may cross, so that the user can "hear" colors or "feel" sounds. These distortions are augmented by increased color intensity and infinitely repeating geometrical figures. In staccato fashion, all of these internally generated sensory perceptions occur at a rate of up to 20 hallucinations/distortions per minute.[1]

DESCRIPTION

LSD is an extremely potent drug that is taken orally. It produces a "rush" or "high" at a single dosage of 0.5 μg. Sensory distortions and hallucinations occur at dosages of 10 to 20 μg.[1] Dosages in excess of 30 μg produce unique cross-sensory experiences—synesthesia. LSD effects were achieved in pre-Colombian Aztecs who chewed seeds of the morning glory family, *Rivea corymbosa* and *Impomoea versicolor*.[2] Contemporary LSD was first synthesized by Hoffman in 1943.[3]

Most LSD now used is of the synthetic variety. To increase the potency of its hallucinatory experiences, it is adulterated ("spiked") with phencyclidine, strychnine, or methamphetamine. Although the effects of LSD are usually instantaneous, delayed reactions may occur. These include depression, hallucinatory flashbacks, frank psychoses, and personality changes. Flashbacks may occur up to a year after the last ingestion. These flashbacks are independent of frequency and dosage size. Other effects are dose dependent.[4]

Although the hallucinatory distortion is intense, the user can usually distinguish between internal and external reality experiences.[5] Unlike the schizophrenic and like Alice in her adventures through the looking glass, LSD users can easily skip across the twin experiential planes or coexist within them simultaneously.[6] At the cinema, a viewer may observe the film on the screen as well as the decor within the theater. The LSD user experiences a similar phenomenon except that the screen now exists solely within the theater of the mind. Projected on this screen are idiosyncratic images that users find difficult to describe in the language of external reality.

The images, while internally derived, can be influenced by the external environment

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much like the sleeper whose dreams may be shaped by a coeval television set. These images usually appear flattened like a cubist fantasy or caricatured like a cartoon figure. They exist, statically or dynamically, against a backlit background in which a fixed white light seems to bleach the center so that objects are best viewed on the periphery. The background scenery is often imprinted with a reticular "netting," spiral tunnel, or receding walls. Both figures and the scenery are drenched with intense colors. A common feature is the apparent movement of the visual field so that figures seem to rush or explode toward the subjective viewer.[5]

Complementing these visual changes are other sensory distortions. Users report unique haptic hallucinations (eg, "My hand turned into a turtle, grew wings, and flew away"). There may be sensations of floating in a void, between planets, above the clouds, or within the ocean. Sounds seem to well up within the viewer and travel within his body. Simple tactile sensations such as heat, cold, or stabbing pain may coexist with more complex sensations such as sexual arousal or anticipatory excitement. At higher doses, these sensations may cross (synesthesia), so that one may interpret a particular sensory experience through an alternative sensory organ. In this manner, one can "hear green" or report a "cold cinnamon sound."

It is hypothesized that many specific distortions are manifestations of physically determined correlates in the eye.[4] The bright central light may be a function of tear and mucus droplets on the cornea. The reticulation could be due to the retinal arteries creating a shadow on the retinal surface. The irregular surface of the retina itself may create the illusion of tunnels and receding walls. The "breathing" and "pulsing" of figures might be due to retinal arterial pulsations.[7]

DIAGNOSIS

Most LSD experiences, however, have no objective construct. Diagnosis is made by subjective report of the psychedelic experience and laboratory analysis. Nonspecific physical changes may include diaphoresis, dizziness with Romberg's sign, emesis, hypothermia, mydriasis, pilomotor erection, and resting tremor. Phencyclidine adulteration may bring about a variety of changes best remembered by the acronym RED DANES (Red skin, Enlarged pupils, Delusions, Dissociation from reality, Amnesia, Nystagmus, Excitation, Skin dry).

Strychnine can cause anxiety, convulsions, diaphoresis, hyperactivity, hyperreflexia, hypersalivation, hypertonicity, hypoxia, lactic acidosis, mydriasis, opisthotonos, spasm and tremors in all three spheres. It may be accompanied by lactic acidosis, rhabdomyolysis, and myoglobinuria.

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TREATMENT

Strychnine competitively antagonizes postsynaptic motor and inhibitory receptors. This produces an excitatory motor effect. Tonic convulsions result from actions at the Renshaw cell synapse. At dosages in excess of 30 mg, death can result from respiratory depression at the level of the medulla. Gastrointestinal absorption is rapid, with body-wide diffusion occurring in under five minutes. Twenty percent of the dosage is metabolized via hepatic routes. The nonmetabolized portion is excreted renally. Convulsions are treated with IV diazepam 2 g to 10 g as needed. Ammonium chloride 2 g every six hours in 0.6 NaCl drip at a rate of 100-120 cc/hr to maintain 3-6 cc/kg urinary output can be lifesaving in most acute situations. If available, dialysis should be considered. If the patient is seen soon after ingestion, lavage with activated charcoal 60 gm to 100 gm.[8]

Phencyclidine (PCP) is usually not life threatening. Acute PCP ingestion is lavaged with ammonium chloride 0. 3 gm/kg (charcoal is not useful). Since excretion is 96% to 98% renal, acidification by ascorbic acid 1000 mg IM every six hours will speed elimination. In addition, ascorbic acid has a synergistic antipsychotic effect with haloperidol. Since PCP is a DA_2 agonist, use of a DA_2 antagonist such as haloperidol 5 mg IM or pimozide 2 mg IM will generally block most psychoses.[6] Injection of furosemide 40 mg IM combined with forced fluids or IV drip will ensure elimination.[9]

LSD treatment is generally nonpharmacological. Since LSD's major action is serotonergic, neuroleptics are generally ineffective for acute distortions or synesthesia. They are, however, efficacious for acute psychoses. LSD overdose occurs rarely. Treatment consists of verbal support in a sensorially minimalist environment. Reassurance, quiet, and monotony are important elements in "talking down" the acutely hallucinating or psychotic patient. Neuroleptics are not usually required in these circumstances. If agitation does not respond to environmental intervention, inject lorazepam 1 mg to 2 mg intramuscularly.

Prolonged or chronic psychosis requires inpatient treatment and use of neuroleptics. The psychosis is usually responsive to haloperidol 2 mg to 5 mg. Initial dosages can be given IM or PO depending upon resistance. Later dosages should be oral, with frequency of administration a function of psychotic severity. Similar treatment is also useful for personality disorganization and flashbacks.[10] Depression appears responsive to serotonin reuptake inhibitors. Fluoxetine 20 mg QD PO for three to eight months has been reported effective in one trial.[11]

LSD psychoses and dissociation may or may not be uncomfortable according to the patient's subjective perception. They are, however, never toxic or life threatening. Environmental or pharmacological therapy should, therefore, follow the form of minimalist architecture: less is more.

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