

Release

Drugs, The Law & Human Rights

Ketamine

Introduction

Ketamine is a 'dissociative anaesthetic' discovered in the 1960s; it belongs to the same class of drugs as phencyclidine (PCP), and is used as a general anaesthetic and painkiller in veterinary and human medical practice. It is an effective general anaesthetic, having the unusual effect for these drugs of stimulating rather than depressing breathing. However, it has strong psychotropic effects, with medical patients having awakened from operations to report meeting God. Ketamine produces the sensation that the mind is separated from the body.

The licit drug is sold as an injectable liquid, while the illicit product is more often a powder, a white crystalline substance reminiscent of cocaine. It may be taken orally (often mixed in drinks), injected into a muscle or (most commonly) snorted. When snorted the drug takes effect after about one minute and lasts for 20 to 40 minutes. At lower doses the effect is primarily one of euphoria, accompanied by numbness and loss of coordination.

Higher doses can produce full-blown 'out-of-body' experiences in which people report reaching parallel world and states of consciousness (the 'K hole'). Some people experience an involuntary paralysis, which can be very frightening. Other unpleasant side effects can include blackouts and loss of bladder control.

On the street the drug is known as 'K' or 'Special K'.

Chemistry

Ketamine, like PCP, is primarily a non-competitive antagonist of the NMDA receptor, which opens in response to binding of the neurotransmitter glutamate. This NMDA receptor mediates the analgesic effects of Ketamine at low doses. Evidence for this is reinforced by the fact that naloxone, an opioid antagonist, does not reverse the analgesia. Studies also seem to indicate that Ketamine is 'use dependent', meaning that it only initiates its blocking action once a glutamate binds to the NMDA receptor.

At high, fully anesthetic level doses, Ketamine has also been found to bind to opioid mu receptors and sigma receptors. Thus, loss of consciousness that occurs at high doses may

be partially due to binding at the opioid mu and sigma receptors.

The effects seem to take place mainly in the hippocampal formation and in the prefrontal cortex. This evidence, along with the NMDA receptor's connection with the memory formation process, explains Ketamine's profound effects on memory and thought. These effects inhibit the filtering function of the brain and may mirror the sensory overload associated with schizophrenia and near death experiences.

The local anesthetic effects are likely to be from the blocking action of Ketamine on sodium channels. Its *in vitro* blocking potency of sodium channels in the resting state is similar to that of lidocaine.

Ketamine has a well-documented neuroprotective effect against ischemic brain-injury and glutamate induced brain injury. One hypothesis of its working mechanism in cases of chronic pain management and depression is that it works as an antidote to an over activity in glutamergic brain circuits.

History

First synthesized in 1962, Ketamine (like its near relative PCP or 'Angel Dust') was marketed by US pharmaceutical company Parke Davis as an animal anaesthetic. It was also used as a battlefield anaesthetic amongst the militaries of developing countries. Its illicit use became popular on the dance club scene amongst gay men in the 1970s; the dissociative effect that seems to split the mind from the body made it attractive as a sexual adjunct, and it was rumoured to be especially effective in facilitating sexual frisson in encounters between strangers.

The seventies also saw Ketamine used by the famous explorer of unusual states of mind, John Lilly MD. Other researchers into these obscure experiential zones used Ketamine too, and not always with the happiest outcomes. Marcia Moore, a yoga teacher and partner of physician Sunny Althounian, with whom she shared regular and intense exploration of the K.experience, valorised the use the drug in the book *Journeys into the Bright World*. She disappeared on a icy cold night in January 1979, having injected large quantities of Ketamine; her skeleton was discovered in a nearby forest some two years later, apparently having frozen to death while on some out-of-body trip.

The action of Ketamine in producing both hallucination and delusionary states, in addition to social withdrawal and disintegrative effects on subjectivity, have led some researchers to propose it as a pharmacological model for schizophrenia. The theory is controversial, and says nothing about the social aetiology of the condition.

Use and culture

Ketamine is sold either in powder or liquid form, and may be snorted, swallowed in beverages or injected. It can also be smoked, usually mixed with tobacco and/or cannabis. Smoking causes the drug to onset much more rapidly than snorting or intra-muscular injection. Oral use requires a larger dose to produce the distinctive dissociative effects, as the drug is quickly metabolized to norketamine, which produces sedation. Though Ketamine can be injected into the vein, it is a hazardous method of use, since its effect is extremely rapid (10 to 15 seconds) and results in greater respiratory depression. The drug is quite shortacting, with effects lasting from 15 minutes to a couple of hours.

At low doses, the hallucinatory effects of the drug are usually only noticeable with the eyes closed or in a darkened room. At higher doses, the dissociative effect is marked, and users can enter into entirely alien worlds and dimensions (the K-hole). Users may experience sensations of flying or gliding and strange distortions of time and space, telepathic experiences and so forth. The sense of personal and social identity can be completely gone in these states of mind. Anyone contemplating exploring such zones should do so in the company of trusted and preferably experienced friends who know what is happening and can provide protection and reassurance if necessary.

Ketamine remains popular with certain groups of users following its advent on the UK dance scene in the late 1980s.

Health

Some unpleasant psychological effects of Ketamine have been observed; these often include an awareness of the body's inability to move, especially where the drug has been taken orally. Other bad experiences have resulted where people in clubs have been sold K as Ecstasy, and the club environment has provided an unsuitable context for the very 'altered' states of mind that Ketamine produces.

Nausea and vomiting are common side-effects, as are loss of balance and an inability to walk properly, or to do things in a coordinated fashion. At high doses blackouts and paralysis can occur, along with loss of bladder control. Certain longer term changes in brain chemistry have been observed in laboratory animals, but these do seem to reverse with time, and most are not seen in humans. Those effects that may occur in human neurological systems are treatable by various medical means. Damage to liver, kidney and bladder function that one study reported was, the researchers acknowledged, most likely attributable to substances with which the street drug had been cut.