

The Use of Ketamine in Psychiatry

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INTRODUCTION

Ketamine hydrochloride has been used as a short acting anesthetic agent.^{1,2,3} The present report is, to the best of our knowledge, the first investigation into the use of this chemical as an abreactive agent. Additional investigations have related to the Ketamine's mind expanding effects.

MATERIALS AND METHODS

Subjects were chosen from the inpatient population of a psychiatric unit of a university hospital in southern Iran. Description of the area and hospitals are presented elsewhere.⁴ Patients with organic brain syndrome and psychoses were excluded. A total of 100 patients were investigated. Each patient was told an overview of the technique and a written permission for the treatment was obtained.

Patients who entered the study were kept NPO for 4 hours. They were then put to bed on a supine position and received 0.5 mg of atropine intravenously. Subsequently, Ketamine was administered, also intravenously. To determine the optimal Ketamine dose, the drug was administered in 3 dose ranges.

The first group (25 patients) received 0.2 to 0.3mg/kg body weight. The second group (96) which included 24 from the first group, received 0.4 to 0.6 mg/kg body weight of the drug. The third group of 4 patients were given 0.7 to 1.0 mg/kg body weight of Ketamine.

To determine the anesthetic effect of the drug, subjects were asked to count backward and errors in counting or speech disorders were considered significant.

The abreactive effect of the drug was evaluated by observation on part of a psychiatrist

(E.K.) present during the drug administration. The abreactive effect was considered present when patients demonstrated 1) excitement, 2) emotional discharge, 3) verbalization of conflict, and 4) emergence phenomenon. Whenever there was no spontaneous response, the abreactive effect was induced by verbal stimulation. Mind expanding effects of the drug were determined through patient interviews. Patients were then evaluated in terms of facilitation of psychotherapy and symptom relief. The period of observation extended from immediate to up to a year.

RESULTS

The sex distribution of the 100 subjects as well as their psychiatric diagnosis is presented in Table I. The youngest was 16 and the oldest 66.

The first group received 0.2-0.3 mg of Ketamine/kg body weight. Of the 25 subjects in this group, only 1 had the minimal anesthetic response, i.e. speech disorder. This was the only patient who also responded with abreaction and the psychotherapy was facilitated. In fact, the patient left the hospital 1 week later. The diagnosis was dissociative reaction and she has been observed for a year with complete relief of symptoms. In all, 24 out of the 25 in this first group showed neither the mini-

TABLE I

Diagnoses	Number of Patients	
	Male	Female
Anxiety reaction	8	2
Dissociative reaction	5	1
Phobic reaction	6	1
Obsessive compulsive reaction	3	0
Conversion reaction	2	9
Hysterical convulsions	0	13
Hypochondriasis	19	4
Depressive reaction	3	4
Tension headache	10	5
Ulcerative colitis	5	0
Total	61	39

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mal anesthetic effect nor the abreaction response. These 24 were then given a higher dose of Ketamine (0.4-0.6 mg/kg body weight) along with 72 others, a total of 96 had the minimal anesthetic response while 95 demonstrated the abreactive response. Of the latter, all had facilitation of their psychotherapy and symptom relief. The one who did not respond had severe tension headaches.

Group 3 included only 1 failure from the group 2 as well as 3 new patients. They received 0.7-1.0 mg Ketamine/mg of body weight. All of these patients showed the anesthetic as well as the abreactive response and they all had facilitation of their psychotherapy and symptom relief.

It should be noted that all patients had "a loss of contact" ranging from 25 seconds to up to 4 minutes in which they had the typical schizo-anesthetic appearance (a peculiar look described as an absent minded individual detached from the present and fixed on infinity).³

To sum, all patients responded in every parameter if a sufficiently high enough dose of Ketamine was administered.

The mind expanding effects of Ketamine correlated with abreactive response. Interviews and observations revealed patient reactions such as: "I always wished to scream", "I always desired to make nasty remarks but dared not", "The injection took away the discomfort in my chest", "Heavy burden of sin is gone now", "I now feel carefree with no worries", and "As a child I always wanted to shout but they did not let me." Other statements categorized as psychic changes included: "I was in a different world and with flash backs I was seeing vividly events which led to my illness", "Colors disappeared and I saw only in black and white", "I was talking to the Holy Family", "I was walking everywhere and seeing everything", "I was walking on an infinite piece of land and my life was marching in front of my eyes", "The blue sky was squeezing my chest", "I was flying and chasing my own life", and "I was facing the forgotten memories and was ashamed of them." Two patients felt that their extremities were no longer attached to their trunk. One other experienced the floating of

his hands and his inability to catch them.

All patients who responded also exhibited disorientation in all 3 spheres. Seventy-four subjects also had hallucinatory experiences in the form of a 2 way discussion, together with excitement which reached a peak and was followed by a sudden silence lasting thirty seconds. This rise and fall of excitement occurred a minimum of 3 and a maximum of 14 times. As the effect of the drug was wearing off, silences became briefer and there was an adequate verbal response.

Fifty-one patients recalled vividly painful childhood events regarding the key figures in that period. In 4 cases the abreactive and/or the mind exploration lasted more than 2 hours. And, while 6 patients had 45 minutes of abreaction or mind exploration, in the remaining patients this period was about 75 minutes.

Acceptability

Patients reaction: The first patient, with anxiety reaction, did well during the procedure and only complained of mild dizzy spells which lasted 2 hours. The second patient was a male with a long-standing conversion reaction which was resistant to conventional psychotherapy. He manifested severe excitement, loud screaming and foul language all of which were contrary to his well controlled and composed behavior on the ward. This produced a commotion among the other patients who were eavesdropping in an adjacent corridor, but the following day when this patient (after a night of sound sleep) told his room-mates of how relaxed and great he felt after the injection, many patients volunteered for the same injection.

Complications noted after Ketamine treatment included 2 patients with vomiting and 3 with nausea. In 2 patients with severe depersonalization which had caused severe apprehension, the experiment was ended with Perphenazine (5 mg. i.m.). Perphenazine was also used in those with nausea and vomiting with a favorable response.

Once the ordeal was over, the patients were asked "What had happened" and "How they felt" in order to make the experience accessible to their consciousness for a later interview or interpretation. They vividly recalled all events,

at times with encouragement. Finally, 78 patients felt so tired that they wished to be left alone in order so that they could sleep.

All of the subjects were seen 6 months after the injection. Only 9 patients were not doing well at this time. Two of these had latent homo-sexuality and obsessive compulsive neuroses. The others had hypochondriasis with paucity of intellectual functioning and a poor adjustment to their work and family life. Ninety-one of the patients were doing quite well.

After one year, 88 patients were still being observed and all except two were doing well (one had ulcerative colitis, the other tension headaches). Interestingly they both requested another injection which was given and led to relief of symptoms for the brief period of follow up just prior to completion of this manuscript.

DISCUSSION

In 1959 Phencyclidine was found to be a useful anesthetic agent.⁵ Simultaneously, its schizophrenomimetic properties were also observed.⁶ Because of its many side effects, Phencyclidine was abandoned though attempts at discovery of its less hazardous derivatives continued.⁵

One such compound was found to be 2-(4-chlorophenyl) 2-(methylamino) cyclo hexanone hydrochloride or Ketamine. As an anesthetic agent, Ketamine was found to induce a profound analgesia combined with an unconsciousness in which the patient appears disconnected rather than asleep.¹ Thus, pharmacologically, Ketamine is categorized as a dissociative anesthetic agent. Its side effects have included an unpleasant emergence phenomenon. In our investigation this same emergence phenomenon was fully exploited for exploring the mind and noting its abreactive effects.

One hundred patients with a variety of psychiatric diagnosis have been part of our study. Three different dose schedules of Ketamine were used and it was noted that a minimal anes-

thetic response was required for the expected abreactive effect. In all, Ketamine at 0.4-0.6 mg/kg body weight led to minimal anesthetic effect and the abreactive response in nearly all of the subjects. The abreactive effect correlated well with the Ketamine's mind expanding effects.

Ketamine was found to be a fast acting drug with a short duration of action. It induced regression, introversion, lability of mood and perceptual disturbances. Moreover, it led to a loss of time sense and detachment from the environment. It activated the unconscious and repressed memories, while it temporarily transported the patient back into childhood with frightening reality, reviving traumatic events with intense emotional reaction. Some had recall of events leading to their illness. Interestingly, patients showed a good degree of verbosity and inhibitions were gone.

Within one year of follow up, nearly all patients had remained well, though 2 required a second injection. The complications were very minimal and included apprehension (2 subjects), nausea (3 subjects), and vomiting (2 subjects). In conclusion, Ketamine was found to be a safe psychotomimetic agent.

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