

KETAMINE ABREACTION A NEW APPROACH TO NARCOANALYSIS

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SUMMARY

Ketamine is a parenterally administered non barbiturate anaesthetic agent, in use for more than a decade. It is a safer than Na Pentothal. Administered intramuscularly, in dose of 6 to 15 mgm/Kg body wt. it produces dissociative anaesthesia. But, in smaller sub anaesthetic doses it may act as an abreactant. We report in this study the abreaction effect of Ketamine in dose of .5 to 1.5 mgm/kg body wt. given intramuscularly in 30 selected psychiatric cases requiring narcoanalysis for diagnostic or therapeutic purpose. The results are compared with another ten cases subjected to pentothal interview and five cases subjected to narcoanalysis with intravenous Na Amytal and methidine. Our findings suggest that Ketamine has property of an efficacious abreactant in doses of 1 to 1.5 mgm/kg body wt. administered intramuscularly and can successfully be used for narcoanalysis in properly selected cases as a good substitute for intravenous pentothal or sodium amytal with methidine. The relative cardio respiratory safety and ease of administration are its two added advantages.

Introduction⁶

Narcoanalysis is an important diagnostic and therapeutic procedure for promoting abreaction and has considerable value as a vehicle of suggestion in neurotics (Handerson & Gillispie 1969, Slater & Roth 1969). Amongst the available drugs, at present, Sodium Pentothal is used mostly for this purpose (Sargent & Slater 1963, Sharoff 1967). The safety gap between its fatal dose and hypnotic dose is quite narrow and mostly depends on the rate of administration (Ludwig & Surawicz 1975). A more safer non barbiturate anaesthetic agent Ketamine has come in use for the last one decade, which can be administered intramuscularly also. It has been safely used for anaesthesia even in aged and critically ill patients (Lorhan & Lippman 1971, Barson & Arens 1974). In the anaesthetic doses Ketamine produces a post anaesthetic emergence reaction with certain psychic symptoms viz., transient alterations in mood state, dissociative experiences and occasional frank delirium (Knox et al

1970, White et al 1980) in < 5 to > 30% of cases as reported in different series (Paul et al 1982). These can be effectively controlled with benzodiazepines or Chlorpromazine (Peter et al 1972, Dundee & Lilburn 1977, Lilburn et al 1978). Ketamine is also safer in sub anaesthetic doses and has been used to produce analgesia in obstetrics (Janeczko et al 1974). The increasing popularity of Ketamine amongst surgeons and anaesthetists is evident by the number of publications and review on the subject (Paul et al 1982). Golechha et al (1985) in their study of two cases found Ketamine, when used intramuscularly in smaller subanaesthetic dose, produced a satisfactory abreaction. To assess further about the abreaction achieved with Ketamine for narcoanalysis, we undertook the present study with a view to know the optimum dose and its side effects and compared it with other methods available.

Material and Methods

Forty five patients with different psy-

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chiatric presentations and diagnosis in whom after detailed initial psychiatric work-up, narcoanalysis was indicated either for diagnostic or therapeutic purpose were taken for this study. The study was spread over seven months. All the patients were willing. Their consent for abreactive procedure/narcoanalysis was taken after explaining the nature, purpose and necessity of the procedure. This also helped in gaining their co-operation and establishing better rapport so essential for such procedures. In case of minors and ladies consent of parents/next of kin was also obtained. Detailed physical examination was done in all cases and routine investigations of blood and urine done to rule out physical contradictions for the use of drugs employed. To compare the efficacy of Ketamine abreaction with pentothal interview and others, the sample was divided into two groups. One was called test group. It was subjected to Ketamine abreaction. It had 30 cases. The other was control group which had 15 cases. They were subjected to narcoanalysis by sodium pentothal and sodium amytal with methidrine the drugs already in vogue for narcoanalysis. Both the groups were subdivided into further sub-groups. To know the most effective abreactant dose of Ketamine, the test group was subdivided into sub groups A, B & C and dose of Ketamine per Kg. body wt. was fixed as .5 mgm, 1 mgm & 1.5 mg respectively. Route of administration remained intramuscular in all the cases in the test group. Ketamine of Ketlar brand in concentration of 10 mgm per ml was used and injected slowly but deep intramuscularly in gluteal region over 2 minutes. The control group consisted of two sub groups D & E. Sub group D had 10 cases. Sodium pentothal 2.5% freshly prepared solution was administered drop by drop intravenously over 30 to 40 minutes monitoring the required hypnotic state of the patient and vital parameters while simultaneously interviewing the patient

(Arieti 1975). Sub group E had 5 cases. They were given sodium amytal 2.5% solution prepared by dissolving 500 mgm into 20 ml distilled water and administered slow intravenously over 5 to 7 minutes. It was combined with methidrine 30 mgm which was given with the same needle but by different syringe after Sodium Amytal. As far as possible every third narcoanalysis done belonged to control group. Normal precautions as followed for pentothal interview were followed in all cases. All patients were instructed to be empty stomach for at least 5 hours preceding the administration of drugs for narcoanalysis to avoid possible occurrence of vomiting and risk of aspiration. The procedures were performed in forenoon and patients remained under close observation for another 3 hours. The abreactive procedure/narcoanalysis was performed by the consultant incharge of the case with whom patient carried his rapport. The results of abreactive behaviour and revelation of conflicts were recorded on a score sheet, specially designed for the purpose (Appendix). The scoring was done independently by two observers one of whom was the consultant incharge who performed the narcoanalysis. Average of two scoring was taken for the study. The inter score reliability was also worked out. Repeated recording of pulse, respiration and blood pressures were made at the interval of 15 minutes after drug administration. Side effects and untoward symptoms reported by patient were recorded separately in each case. Followup of each case was done after 24 hours and then weekly for 3 weeks. Summary of verbatim was recorded by observers in all cases at the end of procedure.

Results

Age, sex and number of cases subjected to narcoanalysis by different drugs and route of administration is shown in Table 1.

Table 1
Age and Sex of cases subjected to Narcoanalysis by different drugs

I Test Ketamine	Route	Sex		Total	Mean age in years	Sd
		M	F			
A) 0.5 mgm/Kg body wt	IM	8	2	10	25.3	± 1.8
B) 1 mgm/Kg body wt	IM	7	3	10	22.3	± 5.3
C) 1.5 mgm/Kg body wt	IM	8	2	10	23.5	± 4.9
II Control						
D) Thiopentone sodium 0.5 gm in 2.5% solution	IV	7	3	10	24.7	± 5.1
E) Sodium Amytal .5 gm in 2.5% solution with inj. methidrine 30 mg	IV	3	2	5	23.2	± 3.7

Table 2
Presenting symptoms/diagnosis and type of abreactive procedure

Presenting symptom/ diagnosis	No. of cases	Ketamine			Thiopentone Sodium	Na. Amytal and Methidrine
		0.5 gm/ Kg. A	1mg/kg B	1.5 mg/Kg C	D	E
1. Sexual Weakness	7	1	2	2	1	1
2. Hysterical Fits	9	2	2	2	2	1
3. Hysterical Paralysis	5	1	1	1	1	1
4. Hysterical Aphonia	3	-	1	1	1	-
5. Psychogenic Headache	4	2	1	-	1	-
6. Chest Pain (Functional)	3	1	-	1	1	-
7. Pain Abdomen (-do-)	3	-	-	1	1	-
8. Neurotic Depression	5	1	1	1	1	1
9. Anxiety State	6	2	1	1	1	1
Total	45	10	10	10	10	5

Number of cases with their presenting symptoms and diagnosis and type of abreactive procedure used are tabulated in Table 2.

For observation purpose 3 stages of narcoanalysis were identified. The first stage was the stage of induction of hypnosis, second was stage of abreaction and third being recovery stage. Induction of hypnosis was a smooth process with Ketamine. On an average it took about 12 minutes before the

hypnotic stage was fully induced. With sodium thiopentone it was fraction of minute and with Sodium Amytal it varied from one to two minutes. Observation during abreaction were made for level of altered state of consciousness, motor activity, state of excitement, Communicability, emotional out burst, revelation of conflicts and expression of guilts. They were scored depending on their intensity as mild, moderate or severe as shown in Table 3

Table 4
Number of cases showing moderate and severe response
(Factor wise abreaction response by different methods)

Responding Factor	Hypnotic State		Motor Activity		Verbal Commun		Excite ment		Emotional out burst		Conflicts & guilts		Total score	Mean score
	M	S	M	S	M	S	M	S	M	S	M	S		
Intensity														
Moderate - M	M	S	M	S	M	S	M	S	M	S	M	S	M = 1	
Severe - S													S = 2	
TEST :														
KETAMINE :														
A. .5 mg/Kg. (N-10)	4	-	4	-	5	-	2	-	4	-	3	1	24	2.4
B. 1 mg/Kg (N-10)	5	2	3	2	4	3	4	3	4	2	4	3	54	5.4
C. 1.5 mg/Kg. (N-10)	4	5	5	3	4	5	4	4	4	4	3	5	76	7.6
Control :														
D. Na Pentothal	4	6	3	-	5	1	3	-	5	1	4	2	44	4.4
E. Na Amytal Methidrine (N-5)	3	2	2	2	1	4	2	3	2	3	2	3	46	9.2
* Total No. of patients showing moderate & severe response	20	15	17	7	19	13	15	10	19	10	16	14		

* Excludes patients showing mild response they were scored - 0.

(Appendix). This scoring was done for the maximum response achieved during the second stage of abreaction. The various abreaction responses shown by the patients with different methods of narcoanalysis are shown in Table 4.

For simplicity of comparison the intensity of response was expressed in numericals. Mild response was of no significance hence scored - 0. The response under the six factors were scored one each if it was moderate and 2 each if it was severe. The means for group A, B, C, D & E were 2.4, 5.4, 7.6, 4.4 & 9.2 respectively. The inter rater score reliability was found to be .75

It was observed that mean abreaction score of Ketamine was dose dependent being highest with 1.5 mgm/kg body wt. and

lowest with .5 mgm/kg body wt. Abreaction with Ketamine 1 mgm/kg was better comparable to that with Na pentothal and abreaction with Ketamine 1.5 mgm/kg body wt. was nearer to that achieved with Na Amytal & Methidrine group.

The untoward symptoms observed are shown in Table 5. Floating sensation, diplopia, nystagmus, feeling of loss of sensation were observed with Ketamine in some cases; But they were transient and subsided as the patient made recovery from narcoanalysis within next four hours. In five cases nausea and giddiness persisted for 12 to 16 hours. Four cases belonged to Ketamine 1.5 mgm/kg body wt. group and one belonged to Na Amytal methidrine group. No one in the Ketamine group had shown the post anaesthetic psychic emergence

Table 5
Untoward Symptoms

Sl.No. Symptoms	.5 mgm/kg (N-10) A	Ketamine 1 mgm/kg (N-10) B	1.5 mgm/kg (N-10) C	Thiopentone (N-10) (N-10) D	Na Amytal Methidrine (N-05) E
	1. Headache	-	1	-	1
2. Nausea	1	2	2	2	1
3. Giddiness	-	1	1	2	2
4. Vomiting	-	-	1	-	1
5. Floating Sensation	1	1	-	-	-
6. Diplopia	-	-	1	-	-
7. Nystagmus	-	1	2	-	-
8. Loss of sensation in limbs	-	-	1	-	-
9. Hallucinatory Experiences	-	-	-	-	-
10. Dream State	1	2	2	1	1
11. Prolonged Recovery > 3 Hrs	-	-	1	2	1
12. Significant rise in BP Systolic > 20 mm Diastolic > 10 mm	3	5	6	-	5

reaction as described in the literature. Except for the induction stage patients were responsive to verbal communication although abreacting. No one required any sedatives during the recovery stage. The verbal expression and expression of conflicts and guilts during narcoanalysis was of the nature of detailed elaborations of what they had expressed during face to face interview before the narcoanalysis. Certain conflicts revealed first under narcoanalysis were found related to their factual past life experiences as confirmed during subsequent interview.

Subsequent weekly followup did not reveal any significant physical/somatic after-effects or deterioration in mental functioning of the patients in any subgroup. But, the accentuation of their presenting symptoms with enhanced feeling of apprehension were seen in varying proportion in about 60% of cases in both test and control groups. This was

accepted as the normal outcome after narcoanalysis and reflected the dynamics of underneath psychopathology understanding of which guided the further line of therapy with gratifying results.

Discussion

Ketamine in high doses produces dissociative anaesthetic state in which functional and electrophysiological dissociation between thalamo-cortical and limbic system occurs (Corssen et al 1968). It has excitatory effects over limbic system without any evidence of seizure activity (Kayama & Iwama 1972). During recovery from anaesthesia an emergence phenomenon has been observed in about 31% (Peter et al 1972) in which psychic symptoms viz., alteration of mood, pleasant and unpleasant dreams, excitement with vocalisation, purposeless movements along with dizziness,

floating sensation and various types of illusions have been reported. These can be efficaciously reduced by giving benzodiazepines (Dundee & Lilburn 1971, Lilburn et al 1978). In a controlled study, Garfield et al (1972) concluded that Ketamine when used in anaesthetic doses has the property of producing auditory, visual, proprioceptive and confusional illusions, common with other general anaesthetics, however the incidence was significantly higher with Ketamine. In our study we did not find this effect of Ketamine in the abreactive doses employed by us. Khorramzadeh and Lofty (1976) believe that the psychic symptoms of excitement and vocalisation during Ketamine emergence reaction are partly attributed to the personality problem of the individual. Harris et al (1975) in their study of Ketamine in subanaesthetic doses on attention, learning and personality during Ketamine emergence, concluded that it could perhaps be used for analysing psychological processes. Yet, there appears no study in the literature where Ketamine has been used to understand and analyse psychological problems. Golechha et al (1985) had reported the abreactant effect when Ketamine is used in much smaller doses.

In the present study, in an attempt to study the subject matter in a systematic manner, we selected the six responding factors as shown in Table 3. Although, all these factors do not reveal the efficacy of an abreactant in equal term yet, they do qualify the desired qualities of the successful abreaction procedure/narcoanalysis and form simple tools to compare the different methods available for narcoanalysis. Exhaustive questionnaire or scale could not be used in the procedures like narcoanalysis, as each patient differed from other in their life situation, conflicts and complaints for which they came for psychiatric help. Emphasis was more on the free flow of thoughts and conflicts from the patient

than the interference from the interviewer. For a reliable comparison common broad guidelines were followed by the interviewer to probe the areas of conflicts ascertained during the psychiatric interview before the narcoanalysis procedure. Our samples both test and control did not include any psychotic. From the verbal expressions during abreaction it did not seem that ketamine in the doses used has led to expression of fantasies, as the material expressed was found to be related to their conflicts and facts of life. The responses observed and scoring results indicate that Ketamine in doses of 1 to 1.5 mgm/kg body wt. administered intramuscularly acts as an effective abreactant. Abreaction score is superior with 1.5 mgm/kg body wt. dose and is comparable to excitatory abreaction achieved with Na Amytal and Methadrine. The untoward side effects as shown in Table 5 are less with Ketamine 1 mgm/kg body wt which is comparable to abreaction achieved with Na Pentothal. The intensity of untoward symptoms/side effects observed was mild and being very transient and reversible, did not alarm the patient or the psychiatrist. Rise in blood pressure necessitated screening of patients for hypertension before being subjected to Ketamine abreaction. The ease of administration and absence of cardio respiratory depressant effect were the two added advantages with Ketamine.

Conclusion

Although in the sample studied Ketamine appears to be an abreactant of choice for narcoanalysis as compared to Na Pentothal, it needs further studies with bigger samples at different centres to establish this.

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APPENDIX

Table 3
Abreaction Score Sheet

No.	Responding Factor	Mild	Moderate	Severe
1.	Hypnotic State	Fully awake to mild sedation	Sedated and Drowsy	Highly drowsy needs arousing
2.	Motor Activity	Nil to mild restlessness	Moving limbs, rolling side to side	Lifting and throwing body parts
3.	Verbal Communication	Nil to answering to queries only	Talking fluently by himself may require encouragement	Continuously talking without inhibition
4.	Excitement	Nil to mild. Pitch of voice not raised	Excited. Pitch of voice raised	Highly excited and shouting
5.	Emotional outburst	Nil to mild apprehensive	Highly apprehensive, feeling depressed, crying, smiling and laughing, expresses anger and annoyance	Weeping with tears rolling down or expresses aggression or laughing loudly or panic state
6.	Revelation of conflicts and guilts	Nil to casual mention of non-significant conflicts and problems; evading and guarding	Conflicts and guilts elaborated and repeated freely	Significant revelation of conflicts and guilt feelings in detail with attached emotions and seeking measures to resolve them