INTRAVENOUS KETAMINE FOR PAINLESS VAGINAL DELIVERY

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SUMMARY

In the present study 50 cases were given low doses of Ketamine Hydrochloride during the course of labour to evaluate the degree of maternal pain relief, after excluding the absolute or even relative contra-indications. It was found that the induction delivery interval was within normal limit. Patient co-operation during 2nd. stage was good and bearing down reflex was not inhibited. 98% patients delivered spontaneously and in only 2% cases outlet forceps was required. No 3rd stage complication was observed.

INTRODUCTION

Child birth has always been regarded as a major source of pain and suffering since the beginning of civilization. In our country relief of pain during labour is still in its infancy. Simple and economical but safe methods will be more acceptable in our circumstances. Hence in the present study intravenous ketamine hydrochloride was evaluated in 50 parturients.

MATERIALS AND METHOD

The present study was conducted in 50 selected patients in the obstetric department of Pt. JNM Medical College, Raipur over a period from April 91 to March 92. Case selection for painless vaginal delivery by intra-venous ketamine was done in consultation with the anaesthetist. The patients of pre-eclampsia, eclampsia, hypertension, heart disease, epilepsy and phychiatric disorders were excluded. Further cases with cephalo-pelvic disproportion, abnormal lie of foetus, multiple pregnancy and existing fetal distress due to any cause were also excluded from the study.

A proper consent was taken after explaining the procedure in detail. Routine investigation e.g. Haemogram, urine analysis, blood grouping and Rh typing was done in all cases and vital parameters like pulse, temperature, blood pressure and respiratory rate were recorded. Weight of the patient

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was recorded to calculate the dose of ketamine. Presentation, position, foetal heart sound, degree of cervical dilatation, effacement, station of head, condition of membrane were recorded and pelvic assessment undertaken.

Well selected and investigated cases having 4 cm. cervical dilatation were made comfortable and an intravenous line established. Then the patient was premedicated with 0.6 mg. atropine sulphate.

Analgesia was induced by injecting 0.2 mg. of ketamine hydrochloride per Kilogram of body weight, slowly intravenously over a period of 30-60 seconds. For maintaining the analgesia a continuous infusion of ketamine 75 mg. in 500 cc of 5% Dextrose solution was used. Infusion rate was adjusted according to response of patient and it was done by observing the facial expression and by directly asking the patient.

Time taken for the onset of analgesia was noted according to the patient's subjective response and observers assessment. All resuscitative measures both for mother and baby were kept in readiness. Pulse, blood pressure, respiratory rate and foetal heart sounds were recorded before and just after induction and then every 15 minutes throughout the period of analgesia.

Assessment of progress of labour was done by observaing the frequency, duration, intensity of uterine contraction, cervical dilatation and descent of the fetal head. Assessment of fetal condition was done by recording fetal heart rate, colour of liquor and presence of moulding or caput if any.

Mode of delivery was noted and with the delivery of anterior shoulder 0.2 mg. methergin was given intravenously to all. Just after delivery each case received 10 mg. of diazepam slowly intravenously.

Placenta was delivered by Modified Brandt Andrews Technique and duration of 3rd. stage was recorded. All the patients were observed carefully for one hour after delivery and recovery time was noted. The emergency reading and complications occuring during the entire procedure were recorded. Duration of 1st. stage after 4 cm. dilatation, 2nd. stage and 3rd. stage of labour were recorded.

Induction delivery interval was calculated from the time between the injection of intravenous bolus dose of ketamine to the time of delivery of neonate. The assessment of new born was done with Apgar score at 1 minute and 5 minute after delivery. Complications, and side effects occuring during entire process were meticulously recorded.

Final assessment of analgesia was done and devided in 3 categories :

Excellent : There was no pain during the procedure.

Satisfactory : Patient had brief period of pain but it was bearable and patient remained co-operative.

Non-satisfactory : Little or no relief of pain and patient became un-cooperative.

All cases were followed during purperium till their stay in the hospital for any untoward effects.

Table I

Induction Dose of Ketamine

Ketamine in Mg.	No. of cases	Percentage
8 - 10	13	26
11 - 13	35	70
14 - 16	02	04
Total	50	100

OBSERVATIONS

The majority of patients were between 18-27 years, the mean age was 23.9 years. The youngest patient was 18 years and the oldest was 34 years.

Ninety six percent of the patients were from urban area, only 4% were from rural areas 80% were between income group of Rs. 301-600, 20% had an income of Rs. 601 and above per month.

Forty six percent of patients were uneducated, 24% were having primary education, 14% were educated upto middle school and 12% were educated upto higher secondary school. Only 4% of patients were graduates.

Sixty two percent of patients were unbooked and only 38% of patients were booked.

Eighty percent of patients were multiparae and 20% were primigravida.

The lowest weight of the mother was 40 kg. and the highest weight was found to be 70 kg. in the study.

An intravenous bolus of 0.2 mg/kg of ketamine was administered for induction of analgesia. The mean induction dose required was 11.3 mg. with a range of 8-16 mg.

The mean onset of analgesia was 56.2 seconds. Majority of patients (64%) had pain

Table II

Maintanance Dose of Ketamine

Ketamine in Mg.	No. of cases	Percentage
51 - 100	39	78
101 - 150	10	20
151 - 200	01	02
Total	50	100

Table III

Mode of Delivery

Mode of delivery	No. of cases	Percentage
Normal vaginal delivery	49	98
Vaginal delivery with outlet forceps	01	02
L. S. C. S.	—	—
Total	50	100

Table IV

Apgar Score

Apgar score	At 1 minute		At 5 minutes	
	No. of neonates	Percentage	No. of neonates	Percentage
10	45	90	50	100
6 - 9	05	10	—	—
Below 6	—	—	—	—
Total	50	100	50	100

relief in 40-60 seconds. The average requirement of ketamine for maintenance of analgesia was 80.7 mg. with a range of 50-170 mg. The total dose was between 91.9 mg. to 181 mg. In primigravidae the mean duration of first stage of labour, after 4 cm. dilatation of cervix was 140 minutes, while the duration of 2nd. stage was 52 minutes.

In multiparae the 1st stage of labour was of 73 minutes, and the 2nd stage was of 25 minutes.

The mean induction delivery interval in primi was 192 minutes whereas in multiparae it was 98 minutes.

In majority of patients (64%), placenta was delivered within 20 seconds and in 36% patients it delivered within 20-30 seconds.

Ninety eight percent of the patients delivered normally, only in 2% of cases an outlet forceps was applied.

There was marginal rise in maternal vital parameters like pulse, systolic and diastolic blood pressure and respiratory rate.

Fetal heart rate remained unaltered throughout the course of labour.

Mean Apgar score at 1 minute was 9.7 and at 5 minutes it was 10.

There was no complication but minor side effects were in the form of dryness of mouth (80%) and visual disturbances in 60% cases. Nausea and vomiting in 4% cases. The incidence of excessive salivation, unpleasant dreams and restlessness in 2% cases. In no case did we observe emergency reaction, tachycardia, hypertension, hypertonicity and PPH.

The mean recovery time time was 30.2 minutes with a range of 20-60 minutes. In about 90% cases there was complete recovery from ketamine within 40 minutes.

Table V

Complications

Complications	No. of cases	Percentage
Dryness of mouth	50	80
Visual disturbance	30	60
Pleasant dreams	6	12
Nausea	2	4
Vomiting	2	4
Excessive salivation	1	2
Unpleasant dreams	1	2
Restlessness	8	16
Emergence reaction	—	—
Tachycardia, hypertension increased muscle tone and PPH.	—	—

DISCUSSION

In present study ketamine hydrochloride was injected initially as intravenous bolus of 0.2 mg/kg. body weight to induce analgesia at 4 cm. dilatation of cervix. The 8-10 mg. ketamine was required in 26% cases, 11-13 mg. in 70% cases and 14-16 mg. in 4% cases. On average 11.3 mg. dose was required for induction.

Akamatsu and Bonica (1974) used 12.5-25 mg of ketamine intravenously in incremental doses. These small doses provided good analgesia and amnesia. Janeczlo et al (1974) used 0.6 mg/kg. of ketamine as intravenous bolus for induction of analgesia and good analgesia was found. A small dose (0.2 mg/kg) used for induction of analgesia, on the body weight basis was found sufficient to induce the analgesia in the present study.

Ayangade in (1979) used fixed dose of 50 mg. as intravenous bolus and excellent analgesia and amnesia was found, although doses used in the present study are still less. A priming dose of 2.2 mg/kg. and 1.5 mg/kg. was used by little and co-workers in 1972, however fetomaternal side effects were more

common but the induction of analgesia was rapid. The dose schedules used by these workers are much higher than in the present study.

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