

Title : CARDIOVASCULAR EFFECTS OF DRIP KETAMINE

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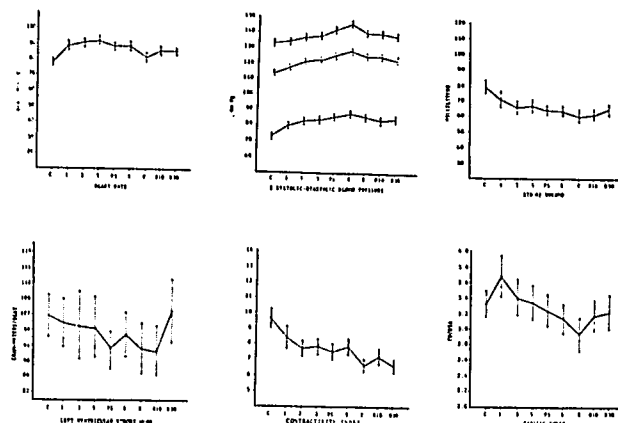
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Introduction. Many attempts have been made to overcome the disadvantages of ketamine, specifically its psychotomimetic effect and the cardiovascular stimulatory effects. In 1967, Chodoff first suggested utilizing ketamine as a continuous drip infusion for this purpose.¹ The concomitant use of large doses of diazepam as a preloading medication has been suggested by others.² Favorable clinical reports from several investigators has prompted a multi-phase, multi-center study of the use of ketamine by constant infusion, complemented with preloading with intravenous diazepam. Five medical center groups participated in the study, and this report will deal with the cardiovascular effects observed under the multi-center protocol study.

Methods. 52 consenting adults, all ASA I, II or III, scheduled for elective non-cavitary surgery were the subjects of this study. As a part of the multi-center study, standard biometrically designed data was recovered on patient profiles, responses, doses, times and psychological reactions, both intraoperatively and postoperatively. This institution chose to study in detail the cardiovascular effects on these patients. Patients were premedicated with diazepam 0.1 mg per kg and scopolamine 0.3 mg IM, one hour prior to anesthesia. Continuous recording and display of systolic, diastolic and mean arterial blood pressure and pulse rate were obtained with hard copy also available. On line computer processing of the data was obtained. During the 15 minutes of quiescence obtained after application of electrodes and transducers, control data was taken and three consecutive control values were found to provide a homogeneous control for each patient. An anesthetic mask was placed on the patient's face and he was given 100% oxygen to breathe using a high-flow semi-closed circle absorption system. At this point an IV dose of 0.2-0.3 mg/kg of diazepam was given, followed within 1 minute by an induction dose of 1 mg/kg of IV ketamine. One minute after the completion of the injection of the ketamine, the baseline studies were taken and a continuous infusion of ketamine was begun through a micro-drip apparatus. The dose was adjusted to the anticipated and manifest needs of the patient. Immediately after the bolus ketamine injection was begun, nitrous oxide, 4 liters, and oxygen, 2 liters/minute was begun. In addition to the aforementioned 1 minute post-ketamine injection, recordings were made at 3 and 5 minute intervals following the ketamine. During the surgical prep, continuous recordings were made,

but hard copy was not made nor were the recordings analyzed because of the variability of the preparation time. Immediately prior to the skin incision and at the 1 minute time after surgery began and at the end of anesthesia, additional recordings were made, as well as in the recovery room 10 minutes after arrival.

Results. All 52 patients in the study received satisfactory anesthesia for the surgical procedure required and the anesthetic procedure was found to be acceptable to all 52 of the patients in the postoperative interview. The total dose of ketamine, expressed in mcg/kg/minute was 64 mcg/kg/minute. It should be noted that this is a smaller dose of ketamine than has previously been reported to be required for anesthesia. The average dose for anesthetics lasting less than 1 hour was higher than those lasting more than 1 hour. A portion of the cardiovascular results of the data obtained are shown in figures 1-6, along with the standard deviations of the data obtained.



Discussion. All of the cardiovascular findings reported in this study are much less drastic than those seen in other reports where the intermittent bolus technique is used. The psychological effects of these patients were considerably less severe than those seen who did not receive the large diazepam supplementation.

References.

1. Chodoff P, Stella JG: The use of CI-581 a phencyclidine derivative for obstetric anesthesia. *Anesth Analg* 45:526, 1966.
2. Kothary SP, Zsigmond EK: Prevention of ketamine induced psychic sequelae by diazepam. *Clin Pharmacol Ther* 17:238, 1975.