TITLE: COMPARATIVE EVALUATION OF FENTANYL VS. KETAMINE INFUSIONS FOR OBSTETRICAL ANESTHESIA

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Introduction: Pregnant patients undergoing midtrimester abortions are frequently anesthetized with intravenous (IV) anesthetics to minimize uterine blood loss. The conventional technique for administering adjunctive IV drugs is repeated, small drug doses. This technique is time consuming and results in oscillating plasma levels that are higher than required or subtherapeutic. The use of continuous infusion would allow anesthetists to titrate these drugs more closely to meet patient needs at any particular time during the procedure. Furthermore, minimizing the "peaks and valley" would probably reduce the amount of drug administered and thereby might decrease side effects and shorten recovery. This study was designed to compare intraoperative and postoperative effects of two commonly used IV anesthetics, fentanyl (F) and ketamine (K), when administered by continuous infusion techniques as adjuvants to nitrous oxide.

Methods: Fifty healthy, unpremedicated young women undergoing midtrimester abortions (16±1 wk gestation) were randomly assigned to receive a continuous infusion of either F (2 µg/ml) or K (1 mg/ml) for maintenance of anesthesia in combination with 70% nitrous oxide in oxygen after a standardized induction with thiopental 4 mg/kg IV. Adjustments in the IV infusion rates were dependent upon clinical signs. Approval was obtained from the Committee on Human Research and informed consent from patients. Baseline mood assessment and Trieger tests were obtained before surgery. Cardiovascular changes were recorded at 1-min intervals using a Dinamap™ monitor/recorder. The amount of drug administered, estimated blood loss, and time to awakening (responding to simple commands) were recorded. Adequacy of anesthesia was assessed by the surgeon and anesthesiologist. Postoperatively, patients completed repeat Trieger tests at 30 min intervals. Side effects and recovery (discharge) time were noted. A follow-up questionnaire was completed 24 hr after surgery. Data were analyzed using SPSS one-way analysis of variance and chi-square analysis.

Results: The F and K groups were comparable with respect to demographic data (age 22±1 yr, weight 57±1 kg) and duration of anesthesia (20±1 min). Blood loss was significantly decreased and the times to awakening and discharge were more rapid in the fentanyl group (Table 1). Spontaneous movements and hypoventilation occurred less frequently in the K group, resulting in more optimal anesthetic conditions (Table 2). However, K produced significantly higher incidences of postoperative confusion, visual disturbances and dreams (Table 3). Patients in the K group had higher sedation scores (Table 3) and Trieger test scores (Table 4). Patient assessments of the anesthesia and their future preference did not differ for these two drugs.

Discussion: A continuous infusion of K produced somewhat better intraoperative anesthetic conditions than F when used as an adjuvant to nitrous oxide. However, the use of K was associated with a greater blood loss, a higher incidence of postoperative side effects, and a more prolonged recovery. Because midtrimester abortions are routinely performed on an outpatient basis, F would seem to offer significant advantages over K when administered as a continuous infusion in combination with nitrous oxide for outpatient surgical procedures.

Table 1: DEMOGRAPHIC AND ANESTHETIC DATA+

Group	Total Dose (µg or mg)	Estimated Blood Loss(ml)	Awakening Time(min)	Discharge Time(hr)
F	204 ± 13	98 ± 19	2.1 ± 0.3	1.1 ± 0.1
K	90 ± 7	179 ± 26*	3.5 ± 0.5*	1.5 ± 0.1*

+ Mean values + SEM
* Significant difference (P<0.05) between the two groups

Table 2: INTRAOPERATIVE SIDE-EFFECTS AND CONDITIONS

Group	Motor Activity	Assisted Ventilation	↓HR	↑BP	Optimal Conditions Surgeon	Optimal Conditions Anesthetist
F	12%	36%	4%	0	80%	84%
K	4%	4%*	0	8%	96%	96%

* Significant difference (P<0.05) between the two groups

Table 3: POSTOPERATIVE SIDE-EFFECTS AND PATIENT ASSESSMENT

Group	Nausea	Blurry Vision	Dreams	Dizzy	Confused	Sedation Score+	Overall Adequacy#
F	56%	12%	16%	32%	0	4.1 ± 0.2	3.0 ± 0.
K	40%	56%*	60%*	44%	52%*	6.0 ± 0.3*	2.9 ± 0.

+ Scaled score: minimal (3) to excessive (9)
# Scaled score: poor (1) to good (3)
* Significant difference (P<0.05) between the two groups

Table 4: PRE- AND POSTOPERATIVE TRIEGER SCORES+

Group	Baseline	30 min	60 min	90 min
F	4 ± 1	10 ± 2	7 ± 1	5 ± 1
K	4 ± 1	20 ± 3*	12 ± 2*	8 ± 1

+ Number of dots missed (mean + SEM)
* Significant difference (P<0.05) between groups