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Title : ALFENTANYL: A NEW NARCOTIC ANESTHETIC INDUCTION AGENT.

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Introduction. Alfentanyl, a new, ultra-short acting (duration of activity = 1/3 of fentanyl) potent (potency = 1/3 of fentanyl) synthetic narcotic is being used as an analgesic supplement with a variety of intravenous hypnotics and/or nitrous oxide for "balanced anesthesia" in a number of European countries. Alfentanyl's rapid onset of action (one circulation time if given as a bolus), short duration of activity (less than five minutes following a single dose) and apparent benignity on circulatory dynamics suggests that it might be useful as an anesthetic induction agent.

The objective of this investigation was to evaluate alfentanyl as an anesthetic induction agent in 20 unsedated patients without history of cardiac or pulmonary disease about to undergo general surgical operation (group I) and 20 well sedated patients with severe coronary artery disease (CAD) about to undergo coronary artery bypass grafting (group II).

Methods. Institutional approval was obtained and all patients gave informed consent at the preoperative visit. Patients in group I were premedicated with atropine (0.1 mg/15 kg, IM) while those in group II were given lorazepam (0.08 mg/ kg, subling.) and atropine (0.1 mg/15 kg, IM). In group I patients heart rate, (HR), systolic (SBP) and diastolic blood pressures (DBP) as well as the presence of arrhythmias (on a lead II EKG), pain (during or after alfentanyl injection), muscle movements, chest wall rigidity (evaluated as 0 = no change in pulmonary compliance during manual positive pressure ventilation; + = can ventilate but decreased compliance; ++ = impossible to ventilate) and the time to unconsciousness were measured during induction. Group I patients also had all the above variables plus respiratory rate, need for analgesics and the incidence of vomiting evaluated in the recovery room. Patients in group II had a similar evaluation as group I during anesthetic induction but also had thermodilution cardiac output (CO) and mean right atrial (RAP) and pulmonary arterial (PAP) pressures measured. Both groups of patients had anesthesia induced in a similar fashion. First they were given pancuronium (1.25 mg/50 kg, IV) and allowed to breathe oxygen for 3 minutes. Then alfentanyl was administered at (1 mg/15 seconds) until the patients were non-responsive to verbal command. Following this, they were given succinylcholine (1.5 mg/kg, IV) and had their tracheas intubated. Patients in group I then received halothane (0.5%) and nitrous oxide (60%) in oxygen and those in group II additional alfentanyl intravenously (a dose equal to their intubating dose). During alfentanyl administration respiration was at first spontaneous, then assisted and finally controlled. Observations and cardiovascular dynamics were recorded before and three minutes after pancuronium administration, at the point of unconsciousness, one minute after succinylcholine and one and four minutes after intubation. Group I patients were also evaluated upon enterance to the recovery room and 5, 15, 30, 45, 60, 90 and 120 minutes later.

Results. The two groups were similar in age and weight. Group I patients required an average of 8.6 mg of alfentanyl and took 134 seconds to become unconscious. Group II patients needed 4.0 mg of alfentanyl and 74 seconds for unconsciousness. No patient experienced pain,only one (group I) had an arrhythmia and four muscle movements of any kind (all in group I and all during laryngoscopy). A mild decrease in compliance was noted in 10 and 30% of group II and I patients, respectively. Severe chest wall rigidity, which was, however, immediately broken with succinylcholine, occurred in 5 and 20% of group II and I. With the exception of SBP, which was slightly increased with pancuronium and slightly decreased with alfentanyl induced unconsciousness, no cardiovascular variable was significantly altered at any time during the study in group II. However, group I patients experienced significant increases of SBP and HR with pancuronium which were maintained until four minutes after intubation. All group I patients were: extubated in the operating room (operations lasted from 30-240 minutes) without need of a narcotic antagonist; breathing normaly, alert and conversant within 15 minutes in the recovery room; and able to be discharged from the recovery room in two hours. Six of this group required analgesics in the recovery room and four experienced nausea or vomited. When questioned post-operatively none of the patients in either group remembered laryngoscopy, intubation or any aspect of the operative procedure.

Discussion and conclusion. The results of this study demonstrate that alfentanyl is a rapid acting, pain-free, narcotic anesthetic induction agent which produces hypnosis, little alteration in cardiovascular dynamics and a minimum, if any, muscle movements.

The data also suggest that alfentanyl's duration of respiratory depression is short and that while chest wall rigidity can be a problem, it can be reduced with a lorazepam premedication (as can cardiovascular stimulation from pancuronium and intubation) and eliminated with succinylcholine paralysis. Our findings suggest that alfentanyl and perhaps other potent, short acting narcotics, may have advantages and deserve further evaluation as anesthetic induction agents.