ORIGINAL PROF-778

PROPOFOL ALFENTANIL INTUBATION;
WITHOUT MUSCLE RELAXANT IN YOUNG ADULT MALES

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ABSTRACT... hameedchohedri@yahoo.com **Objectives:** To assess the efficacy of propofol & alfentanil without muscle relaxant in young adults. Design: Prospective double-blind study. **Setting:** Shiraz University of Medical Sciences, (Khalili teaching hospital Shiraz Iran), **Period:** Aug 2002 to Apr 2003 **Material and Methods:** 75 non-athlete adult males scheduled for elective surgery were randomly divided to receive either succinylcholine 1.5mg/kg (group S), alfentanil 40μg/kg (A-40) or alfentanil 30μg/kg (A-30) in combination with propofol 2.5mg/kg to induce anesthesia. **Results:** Hemodynamic responses and intubating conditions were compared between the three groups. In group S marked increase in MAP and HR occurred after intubation but A-40 and A-30 patients had subtle changes ($p<0.001$). Intubating condition was acceptable in all patients of group S and A-40, but 7 of A-30 group had significant limb movement after intubation. **Conclusions:** Alfentanil 40 μg/kg & propofol 2.5mg/kg could provide favourable intubating condition in young adult males.

Keywords: Intratracheal Intubation, Propofol, Alfentanil, Adult male.

INTRODUCTION

Tracheal intubation during induction of anesthesia is facilitated by the use of depolarizing or nondepolarizing muscle relaxants[1]. Succinylcholine usage can be associated with hyperkalemia, arrhythmias, increase in IOP and ICP, malignant hyperthermia and so on. On the other hand nondepolarizing muscle relaxants may cause prolonged paralysis and inability to restore muscle power in the event of difficult ventilation[1,2]. For these reasons a method of providing good intubating conditions rapidly without using muscle relaxant has been sought and recently alfentanil- propofol combination had been evaluated for this purpose. This combination provide adequate jaw relaxation,

vocal cord visualization and tracheal intubation toleration[1,3].

Having the above mentioned knowledge in mind, we evaluate this issue in young adult non-athlete males. In recent years it has become clear that gender difference exist both in the pharmacokinetics and the pharmacodynamics of drugs related to the practice of anesthesia[4]. Males need more nondepolarizing muscle relaxant than females, the mechanism of which is explained by difference in the volume of distribution[5-7]. For propofol, males are more sensitive to drug effects[8,9], but alfentanil showed no gender difference on dosage requirement[10].

Accordingly we evaluate the recommended dosage of alfentanil-propofol combination, for no-muscle relaxant intubation of young adult males.

MATERIALS & METHODS

After approval of the study in the research-ethic committee of Shiraz Medical School, the study was performed in the Khalili teaching hospital on 75 non-athlete males scheduled for elective ENT operation with ASA:I, malampatti class I and normal BMI (table I). All patients were informed about the study and accepted participation.

Table-I. Demographic characteristics of the studied patients

Group	S	A-30	A-40	*p-value
Age (yr)	25±7.52	26±5.81	25±6.91	0.915
Weight (kg)	64±12.1	60±13.6	63±11.5	0.266

** One-way Anova test*

Table-II. Intubation condition scoring rates

Score Condition	**1**	**2**	**3**	**4**
Laryngoscopy	Easy	Fair	Difficult	Impossible
Vocal cord	Open	Moving	Closing	Closed
Coughing	None	Slight	Moderate	Severe
Jaw relaxation	Complete	Slight	Stiff	Rigid
Limb movement	None	Slight	Moderate	severe

Kruskal-Wallis test was used for analyzing intubation condition datas and one way ANOVA test for hemodynamic parameters.

In the operating room after 10cc/kg infusion of Dextrose Saline, midazolam 0.05mg/kg and lidocaine 1.5mg/kg were injected as premeditation. Then patients were randomly divided into three group of 25 each:

1. Succinylcholine group (S): Succinylcholine 1.5mg/kg, 90 seconds after propofol (2.5mg/kg).
2. Alfentanil-40 group (A-40): 40mg/kg alfentanil 30 seconds after propofol (2.5mg/kg).
3. Alfentanil-30 group (A-30): 30mg/kg alfentanil 30 seconds after propofol

(2.5mg/kg).

Intubations were performed 60 seconds after succinylcholine and 90 seconds after alfentanil in respective groups all by an attending anesthesiologist blinded to induction regimen, by macintosh blade # 4 and high volume/low pressure ETTs. The cuff was inflated till no leak was detected at a pressure of 15-20 mmHg (Cuff Pressure Gauge,VBM, Germany).

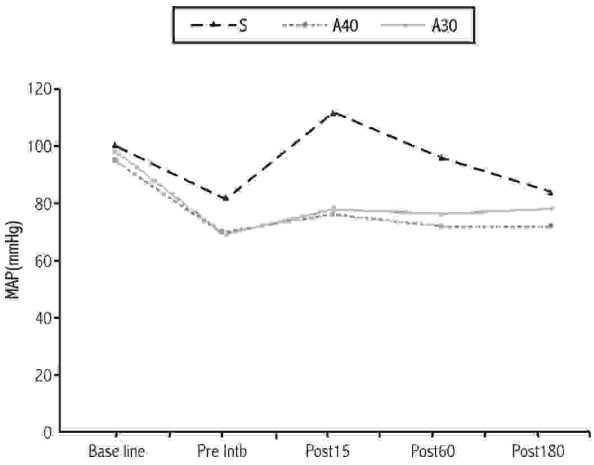

Fig 1: MAP changes in the various stages of measurement

The hemodynamic parameters including mean arterial pressure (MAP) and heart rate (HR) were recorded and intubation conditions were scored according to the Helbo Hanson/Ravlo and Tramp-Andersone scoring system (table II)[11].

RESULTS

Fig 1 & 2 respectively show MAP & HR during various stages of measurement in the 3 groups of studied patients. MAP decreased significantly ($p<0.001$) after induction in all groups, the level being more significant in group A-40 ($p=0.048$) and A-30 ($p=0.013$) as compared with group S.

Fifteen seconds after intubation, MAP was significantly increased (in group S) to a level even above the preinduciton time ($p<0.001$). The level decreased below baseline but still above the preintubation time at 60 and 180 seconds after intubation in this group ($p<0.001$ & $p<0.027$ respectively). Although data in group A-40 and A-30 signify an increase in MAP at 15 seconds after intubation but the increase was less significant than group S ($p<0.001$ for both groups) and below the baseline value. HR showed about the same pattern of changes as MAP in the 3 groups of patients.

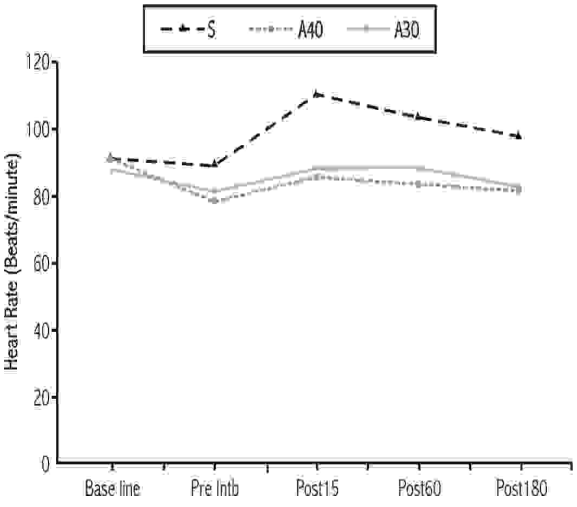

Fig 2: Heart rate changes during various stages of measurement

Intubation was successful in all patients except one of A-30 group who needed succinylcholine for intubation.

Ease of laryngoscopy (score 1 or 2), vocal cord positions, coughing during insertion of the tube and jaw relaxation were acceptable and comparable between all three group of patients. (p-value>0.05).

However limb movement was unacceptable in group A-30 (p=0.011) as compared with the other two groups. (Fig 3)

DISCUSSION

Alfentanil-propofol combination has been used successfully for tracheal intubation without the use of muscle relaxant by many investigators [1,12,13]. In most of these studies a combination of 30-40 mg/kg alfentanil and 2-2.5mg/kg propofol were used and compared with other regimens. But the possible effect of sex on this issue was ignored.

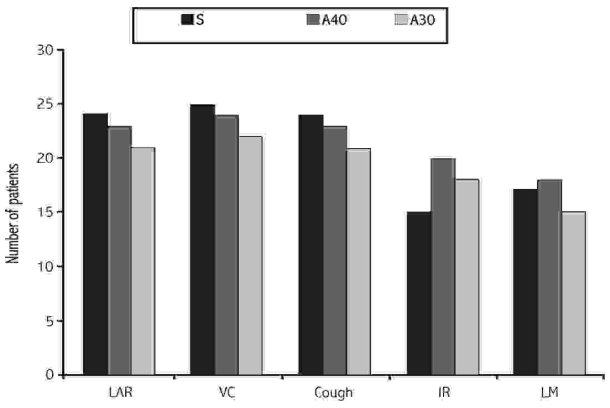

Fig 3: Intubation condition as scored for laryngoscopy (LAR), Vocal Cord Position (VC), Coughing (Cough), Jaw Relaxation (JR) and Limb Movement (LM) in the three groups of patients. (S: Group-Scholine; A40:Group Alfentanil-40; A30: Group Alfentanil-30)

Knowing that males have more muscle mass as compared with females (the ultimate target for any drug used to provide muscle relaxation) and remembering that gender difference do exist in pharmacokinetics and pharmacodynamics of different anesthetic drugs[4-10], we used different dosages of alfentanil in combination with propofol and compared with succinylcholine.

According to results there was significant decrease in MAP and HR in A-40 and A-30 groups as compared with group S. This could be due to additive effects of alfentanil and propofol [14]. But these decreases (27% in MAP and 8% in HR for A-30 group and 28% in MAP and 14% in HR for A-40 group) could be well tolerated by young healthy adults. As a desirable effect, alfentanil/propofol combination blunt significantly the hemodynamic response to intubation (Fig 1,2).

Also the study clearly indicated that laryngoscopy was acceptable and suitable conditions were achieved in all groups. This is superior to the results obtained by Scheller and Erhan who showed that alfentanil 40mg/kg but not 30mg/kg in combination with propofol provide satisfactory intubating conditions [1,14]. We attribute this to the increase in the dose of propofol from 2 to 2.5mg/kg in our study.

However A-30 dosage was associated with unacceptable limb movements after intubation. This finding was previously reported by Steyn in children[15].

CONCLUSIONS

Laryngoscopy and intubation could be performed without muscle relaxant in young adult males using a combination of 2.5mg/kg propofol and either 30 or 40 μg/kg alfentanil.

But we recommend 40μg/kg alfentanil for this purpose because of the better post intubation response.

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