| | ISSN(online): 2589-8698 | | ISSN(print): 2589-868X | | International Journal of Medical and Biomedical Studies

Available Online at www.ijmbs.info

NLM (National Library of Medicine ID: 101738825)

Index Copernicus Value 2018: 75.71

Volume 4, Issue 5; May: 2020; Page No. 181-184



Original Research Article

INTUBATING CONDITIONS: PROPOFOL WITH MUSCLE RELAXSANT AND PROFOFOL WITHOUT MUSCLE RELAXANT A STUDY IN TERTIARY CARE CENTRE

Dr. Anita Chikara

Assistant Professor, Dept. of Anesthesiology Venkateshwara Institute of Medical Sciences, Gajraula, U.P. India.

Article Info: Received 22 April 2020; Accepted 28 May 2020

DOI: https://doi.org/10.32553/ijmbs.v4i5.1438 Corresponding author: Dr. Anita Chikara Conflict of interest: No conflict of interest.

Abstract

Introduction: Neuromuscular blocking drugs, particularly Succinylcholine, may cause serious side effects, but remain in clinical use to facilitate tracheal intubation due to a lack of suitable alternatives. Recent studies have suggested that propofol provides good intubating conditions without muscle relaxants, due to its relaxing action on upper air way. A search for better and ideal intravenous induction agent has led to propofol, a 2, 6, di-isopropyl phenol which was developed following a series of investigations. Propofol reduces hypertension and tachycardia during intubation. The changes in blood pressure observed are due to both decrease in cardiac output and decrease in systemic vascular resistance. Increasing the depth of anaesthesia by administering supplementary increments of induction agent, opioids or lignocaine may improve conditions. These techniques also protect against the potentially adverse effects of tracheal intubation namely systemic, intra-cranial and intra-ocular hypertensions and tachycardia.

Material and Methods: The study comprised of 100 adult patients of ASA grade I & II of either sex belonging to the age group of 18-60 years, drawn from various surgical specialties and undergoing surgery under general anaesthesia. Thorough pre anesthetic checkup was carried out in all patients and informed consent for surgery and general anesthesia was obtained. Routine investigations were carried out in all patients. 100 patients were randomly divided into two groups of 50 patients each.

Results: Youngest patient was of 18 years in group I and 20years in group II. Eldest patient was of 59 years in group I and 60 years in group II. Maximum number of patients were in 20-30 years of age group. The pre induction mean pulse rate (base line) was 101.04±11.78 and 102.36±15.14 in group I and group II respectively. There was slight decrease in pulse rate initially after induction with mean 98.23±13.87 and 97.31±12.60 in group I and group II respectively. The pre induction mean arterial pressure (MAP) (baseline) was 91.47±7.64 and 92.45±9.21in group I and group II respectively. There was slight decrease in arterial pressure initially after induction with mean 80.48±6.29and 83.31±8.41in group I and group II respectively, but the difference was not statistically significant (P>0.05) from the baseline values. There was slight increase in mean arterial pressure just after intubation with mean 93.10±8.47 and 94.58±9.33 in group I and group II respectively, which was not statistically significant (p>0.05).

Conclusion: In healthy adults, with normal airway, propofol 2.5mg/kg when used alone as inducing agent without the use of any neuromuscular blocking agents produced acceptable intubating conditions, when compared to propofol, 2.5mg/kg along with succinylcholine. It was also demonstrated that there was no significant cardiovascular changes when intubation was done without relaxant after induction with propofol.

Keywords: Neuromuscular blocking drugs, cardiovascular, propofol

Introduction

Tracheal intubation is usually facilitated by the use of muscle relaxants After induction of anaesthesia. Neuromuscular blocking drugs, particularly Succinylcholine, may cause serious side effects, but remain in clinical use to facilitate tracheal intubation due to a lack of suitable alternatives. Recent studies have suggested that propofol provides good intubating conditions without

muscle relaxants, due to its relaxing action on upper air way. A search for better and ideal intravenous induction agent has lead to propofol, a 2, 6, di-isopropyl phenol which was developed following a series of investigations. A description of the discovery of anesthetic activity of this and other alkyl-phenol has been provided by James and Glen in 1977ⁱ. Propofol causes rapid and symptoms free clear headed recoveryⁱⁱ particularly for day case surgery.

There is very low incidence of post-operative sickness and much lower incidence of PONV with propofol.

Propofol reduces hypertension and tachycardia during intubation. The changes in blood pressure observed are due to both decrease in cardiac output and decrease in systemic vascular resistance, both of which are decreased by 10% - 20%. It appears that propofol does not impairs baroreceptor sensitivity and that central sympatholytic and/or vagolytic mechanism prevents increase in heart rate despite decrease in blood pressure. The only drawback of propofol is that it is very expensive, slight fall in BP, particularly in large dosesⁱⁱⁱ. Pain when injected into small vein, some incidence of apnoea and thrombophlebitis has been reported.

Increasing the depth of anaesthesia by administering supplementary increments of induction agent, opioids or lignocaine may improve conditions. These techniques also protect against the potentially adverse effects of tracheal intubation namely systemic, intra-cranial and intra-ocular hypertensions and tachycardia. However this must be balanced against the increased risks of hypotension, bradycardia, emesis, delayed recovery and systemic local anaesthetic toxicity^{IV}.

Material and Methods

The present study was conducted in the Department of Anaesthesiology, Venkateshwara Institute of Medical Sciences, Gajraula, U.P. The study comprised of 100 adult patients of ASA grade I & II of either sex belonging to the age group of 18-60 years, drawn from various surgical specialties and undergoing surgery under general anaesthesia. Pregnant ladies, Paediatric patients, Patients with deranged hepatic functions, renal functions and cardiovascular hematologic complications, with potential airway problems, difficult intubation and patients with electrolyte imbalance and known allergy to anaesthetic agents were excluded from the study. Thorough pre anesthetic checkup was carried out in all patients and informed consent for surgery and general anesthesia was obtained. Routine investigations were carried out in all patients.

100 patients were randomly divided into two groups of 50 patients each.

Group I was given: 2.5 mg/kg body weight of propofol injected slowly over 20 seconds.

Group II was given: 2.5 mg/kg body weight of propofol injected slowly over 20 seconds. Time was noted with stop watch after loss of eye lash reflex, induction and then injection succinylcholine 2mg/kg body weight was injected.

Patients were continuously monitored throughout the operation E.C.G. using cardiac monitor on lead II, PaO₂ with Pulse Oxymeter. Pulse and blood pressure were recorded.

All the observation were recorded and tabulated. Results were analyzed statistically by SPSS software version 21.0. X^2 test and 'P' value was less than 0.05 the difference of the two sets of observation was considered significant.

Results

Table 1: Distribution of cases

Group	Drugs	No of cases
1	Propofol without succinylcholine	50
II	Propofol with succinylcholine	50

Table I shows the distributions of cases according to propofol with or without succinylcholine.

Youngest patient was of 18 years in group I and 20 years in group II. Eldest patient was of 59 years in group I and 60 years in group II. Maximum number of patients were in 20-30 years of age group.

Table 2: Sex wise distribution of cases

S. No.	Sex	Group I		Group II		
		No.	%	No.	%	
1	Male	37	74	35	70	
2	Female	13	26	15	30	

Table 2 shows sex wise distribution of cases. In both the groups, there was male predominance with 37 (74%) in group I and 35 (70%) in group II.

Excellent intubating conditions were seen in 30 (60%) patients of group I and 50 (100%) patients of group II.

Table 3: Overall intubating conditions

S. No.	Intubating conditions	Group I		Group	Group II		l Vs I II	Significance	
		No.	%	No.	%	X2	P-	-	
							value		
1	Excellent	31	62	50	100	6.54	<0.05	S	
	8-9								
2	Good 6-7	19	38	00	00	_	_	NS	
3	Fair 3-5	00	00	00	00	_	_	NS	
4	Poor 0-2	00	00	00	00	_	_	NS	

The difference was statistically significant (p<0.05) between group I & group II. Intubating conditions were good in 10 (40%) patients of group I and 0 patient of group II.

The pre induction mean pulse rate (base line) was 101.04 ± 11.78 and 102.36 ± 15.14 in group I and group II respectively. There was slight decrease in pulse rate initially after induction with mean 98.23 ± 13.87 and 97.31 ± 12.60 in group I and group II respectively, but the difference was not statistically significant from the baseline values. (p>0.05).

Table 4: Changes in Mean arterial pressure (As compared to baseline)

Sno.	Pulse Rate	Group I		Group II		T-	p-
		Mean	SD	Mean	SD	value	value
1	Before	91.47	7.64	92.45	9.21	0.92	>0.05
	Induction						
2	After Induction	80.48	6.29	83.31	8.41	1.99	>0.05
3	After relaxant	-	-	83.32	7.13	-	-
4	Just after	93.10	8.47	94.58	9.33	0.58	>0.05
	intubation						
5	One min. after	84.03	9.25	88.78	7.12	1.65	>0.05
	intubation						
6	Two min. after	84.44	6.12	87.11	6.12	1.50	>0.05
	Intubation						
7	Five min. after	91.03	4.13	84.38	6.12	2.70	>0.05
	intubation						

The pre induction mean arterial pressure (MAP) (baseline) was 91.47 ± 7.64 and 92.45 ± 9.21 in group I and group II respectively.

There was slight decrease in arterial pressure initially after induction with mean 80.48±6.29and 83.31±8.41in group I and group II respectively, but the difference was not statistically significant (P>0.05) from the baseline values.

There was slight increase in mean arterial pressure just after intubation with mean 93.10 ± 8.47 and 94.58 ± 9.33 in group I and group II respectively, which was not statistically significant (p>0.05).

These changes in M.A.P. values return to baseline values 5 minutes after intubation.

Discussion

Induction of anaesthesia using short acting hypnotic drugs is frequently facilitated by the simultaneous administration of a depolarizing muscle relaxant such as succinylcholine for endotracheal intubation. Even the non-depolarising muscle relaxants may be associated with undesirable side effects such as prolonged neuromuscular blockade, the need to reverse neuromuscular blockade, or the inability to reverse the paralysis quickly if need arises. For these reasons, a method of providing good intubating conditions rapidly without using muscle relaxants has been sought by many investigators⁴.

Jaw relaxation was good in 44 (88%) patients of group I and 25 (100%) patients of group II, and moderate in 4(8%) patients of group II. In none of the patients of either group, the jaw relaxation was minimal or poor^v. Mark S. Scheller et al^{vi}. (1992) observed good jaw relaxation in all 100% patients receiving propofol with alfentanil. None of the patients manifested opioid induced rigidity at any time.

In our study, the pre induction mean pulse rate (baseline) was was 101.04 ± 11.78 and 102.36 ± 15.14 in group I and group II respectively. There was slight decrease in pulse rate initially after induction with mean 98.23 ± 13.87 and

97.31 \pm 12.60 in group I and group II respectively, but the difference was not statistically significant from the baseline values. (p>0.05).

There was slight increase in pulse rate just after intubation in group I and group II (p>0.05) but the difference was not statistically significant from the baseline values. These changes returned to baseline values 5 minutes after intubation.

Increase in pulse rate after intubation in both the groups may attributed to sympathetic stimulation caused by laryngoscopy and intubation

C. Guidon Attali et al^{vii} (1990) in their study observed that the heart rate increased significantly 5 minutes after intubation and during maintenance, but the increase never exceeded 15% of the basal value.

I. A. Mc Neil et al vii (2000) in their comparison of intubating conditions following propofol with Succinylcholine verses propofol and remifentanil 2 μ gm /kg (PR₂) or 4 μ gm/kg (PR₄) found that values of post induction heart rate decreased from baseline on groups PR₂ and PR₄ by 14% (P<0.01) and 19% (p<0.001) and increased in PS by 15% (P<0.01).

Mean arterial pressure in our study was 92.11±8.48 and 94.64±10.22 in group I and group II respectively.

There was slight decrease in arterial pressure initially after induction with mean 80.88±6.59 and 85.31±8.71 in group I and group II respectively (P>0.05) but the difference was not statistically significant from the baseline values.

There was slight increase in mean arterial pressure from the baseline just after intubation with mean 94.10±8.07 and 95.58±9.46 in group I and group II respectively which was not statistically significant (P>0.05).

These changes returned to baseline values 5 min after intubation. This increase in M.A.P. is also attributed to the increase sympathetic response caused by Laryngoscopy (Table XIV).

C Guidon Attali et al⁷ (1990) observed no significant fall in systolic or diastolic blood pressure during anaesthesia. I. A. Mc Neil et al⁸ (2000) in their study observed similar baseline pre-induction values of M.A.P. in all three groups. Post induction M.A.P. values decreased from baseline in groups PR₂, PR₄, and PS by 21% (P<0.0001), 28% (P<0.0001) and 8% (P>0.05) respectively.

The mean pulse rate was 103.04 ± 13.08 and 104.56 ± 17.14 in group I and Group II respectively. There was slight decrease in pulse rate initially after induction with mean 99.92 ± 13.87 and 98.32 ± 14.60 in group I and group II respectively. There was slight increase in pulse rate just after intubation with mean 115.04 ± 10.15 and 108.96 ± 11.31 in group I and group II respectively.

There was slight decrease in mean arterial pressure initially after induction in both the group.

There was slight increase in mean arterial pressure just after intubation with mean group I and group II. These cardiovascular effects, both pulse rate and M.A.P. returned to baseline 5 minutes after intubation.

Conclusion

In this study it was observed that, in healthy adults, with normal airway, propofol 2.5mg/kg when used alone as inducing agent without the use of any neuromuscular blocking agents produced acceptable intubating conditions, when compared to propofol, 2.5mg/kg along with succinylcholine. It was also demonstrated that there was no significant cardiovascular changes when intubation was done without relaxant after induction with propofol.

References

James R, Glen JB. Synthesis, biological evaluation, and preliminary structure-activity considerations of a series of alkylphenols as intravenous anesthetic agents. J Med Chem. 1980 Dec;23(12):1350-7.

ii Gerald Edelist, A comparison of propofol and thiopentone as induction agents in outpatient surgery, Canadian J. of Anaesthesia, 34:2, Pg. 110-6, 1987

^{3.} iii Chidambaran V, Costandi A, D'Mello A. Propofol: a review of its role in pediatric anesthesia and sedation [published correction appears in CNS Drugs. 2018 Sep;32(9):873]. CNS Drugs. 2015;29(7):543–563. doi:10.1007/s40263-015-0259-6

^{4.} iv Shaikh SI, Bellagali VP. Tracheal intubation without neuromuscular block in children. Indian J Anaesth. 2010;54(1):29–34. doi:10.4103/0019-5049.60493

^{5.} v S.F.E. Coghlan, P.F. Mc Donald and G. Csepregi: Use of Alfentanil without propofol for nasotracheal intubation without neuromuscular block, Br. J. of Anaesthesia 1993; 70: 89-91

^{6.} vi Mark S. Scheller, Mark H. Zornow, and Lawrence J. Saidman, Tracheal intubation without the use of muscle relaxants: A technique using propofol and varying doses of alfentanil, Anesthesia Analgesia 1992; 75: 788-93.

vii C. Guidon – Attali, F Mouillac, D. Quilichini, O Pant and G Francois: Propofol as the main anaesthetic agent in dental surgery. Acta Anaesthesiol Scand 1990; 34: 397-399.

^{8.} viii I.A. Mc Neil , B. Culbest and I. Russel, Comparison of intubating conditions following propofol and succinylcholine with propofol and remifentanil 2μg kg⁻¹ or 4μg kg⁻¹, Br. J. of Anaesthesia 2000, 85 (4): 623-5.