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COMPARISON OF INTUBATING CONDITIONS FOLLOWING ADMINISTRATION OF ROCURONIUM AND SUCCINYLCHOLINE: A PROSPECTIVE RANDOMIZED CONTROLLED STUDY.

Anaesthesiology

Dr. Chirag Babu P. S Prof. Dept. Of Anaesthesiology

Dr. Ambalkar Chaitanya D* Postgraduate Dept Of Anaesthesiology, Ssims & Rc, Davangere, Karnataka. *Corresponding Author

KEYWORDS

INTRODUCTION:

Succinylcholine has been the NMBA of choice for RSII, because of the quick onset along with excellent intubating conditions. However it is desirable to look for an alternative due to its side effects. Rocuronium bromide is a newer non-depolarizing muscle relaxant that is used for rapid sequence induction (RSI) when succinylcholine is contraindicated.

Rocuronium has a rapid onset of neuromuscular blockade with a stable hemodynamic profile, But its use is limited due to its prolonged action. This study is taken up with twice the ED95 dose of rocuronium to find out the intubating conditions and compare it with succinylcholine, as low doses may compromise the intubating condition.

AIM OF THE STUDY:

To compare intubating conditions & onset of neuromuscular blockade following inj. rocuronium (0.6mg/kg) and succinylcholine (2mg/kg) administered in adult patients undergoing elective surgery requiring endotracheal intubation under general anaesthesia.

METHODOLOGY:

After Ethical Committee clearance and written informed consent, a total of 60 patients were enrolled in the study. The study duration was for 2 months. The power of study kept at 80%. Patients of either gender aged between 18 to 60 years belonging to ASA-PS I or II scheduled for elective surgery expected to last about 45 min, requiring endotracheal intubation under general anaesthesia were included in the study.

Following were the exclusion criteria:
1. Anticipated difficult airway.
2. Modified Mallampati class 3 or 4.
3. Presence of neuromuscular disease.
4. Need for rapid sequence induction.
5. Pregnancy.
6. Upper limb surgery.
7. History of allergy to drugs used.

After thorough pre-anaesthesia examination, all patients were kept fasting since the previous night. Anxiolysis and antacid prophylaxis was given. After shifting the patient to OT, an appropriate size cannula was secured. Monitoring using a three electrode ECG, pulse oximetry, NIBP, NMT and ETCO2 was established. Surface electrodes of a peripheral nerve stimulator were placed over the ulnar nerve at the adductor pollicis muscle.

Patients were pre-oxygenated for 3 min with 100% oxygen. Pre-medicated with inj. glycopyrrolate 0.2 mg, inj. fentanyl 2 mcg/kg. Induced with inj. propofol 2 mg/kg. Baseline TOF count of 4 and TOF percentage of 100 were noted. Muscle relaxant to be studied, either inj. Rocuronium 0.6 mg/kg (Group R) or inj. Succinylcholine 2 mg/kg (Group S) was administered.

Using the peripheral nerve stimulator, supra-maximal square wave impulses of 0.2 ms duration were delivered in a TOF sequence at 2Hz for 2s and repeated every 10 seconds. Laryngoscopy was performed by the consultant anaesthesiologist at TOF count 0. Time to reach TOF count 0 was recorded in both the groups. Endotracheal intubation was performed using a Macintosh size 3 blade and an endotracheal tube of adequate size.

Assessment of intubating conditions:

SCORE	JAW RELAXATION	VOCAL CORDS (POSITION/MOVEMENT)	RESPONSE TO INTUBATION	FINAL SCORE
4	Good	Open	None	
3	Moderate	Moving	Sluggish	
2	Minor	Closing	Mild coughing	
1	Poor	Closed	Severe coughing	

TABLE 1. Scores of 9-12: Excellent. 5-8: Good. <4: Poor.

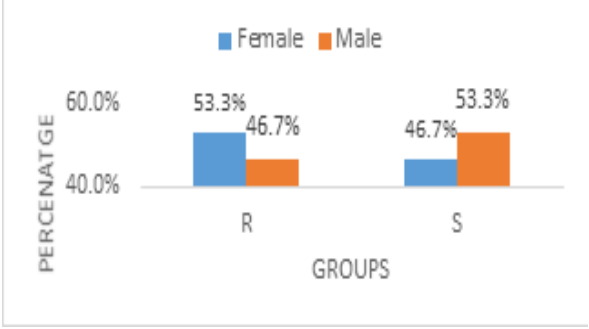
STATISTICALANALYSIS:

Statistical tests used were descriptive statistics (mean age, weight) chi square test and software used was SPSS version 20. A P value of < 0.05 was considered to be statistically significant.

RESULTS:

SEX

Sex	GROUP		Total
	R	S	
Female	16	14	30
	53.3%	46.7%	50.0%
Male	14	16	30
	46.7%	53.3%	50.0%
Total	30	30	60
	100.0%	100.0%	100.0%

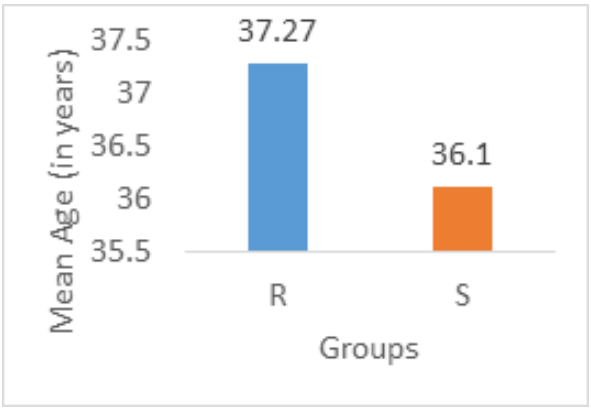


GRAPH 1

TABLE 2 DEMOGRAPHIC PROFILE

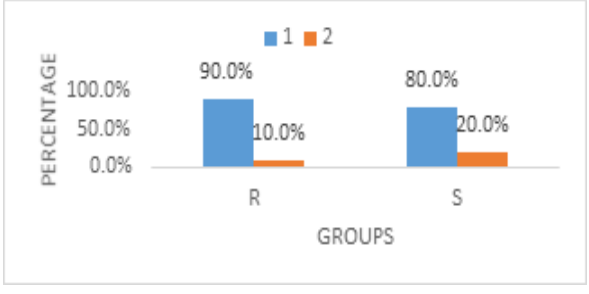
Parameters	R		S		t value	p value
	Mean	SD	Mean	SD		
Age	37.27	11.203	36.10	13.710	0.361	0.719
Weight	52.23	7.050	55.77	7.569	-1.871	0.066

TABLE 3



GRAPH 2

ASA	GROUP		Total
	R	S	
1	27	24	51
	90.0%	80.0%	85.0%
2	3	6	9
	10.0%	20.0%	15.0%
Total	30	30	60
	100.0%	100.0%	100.0%

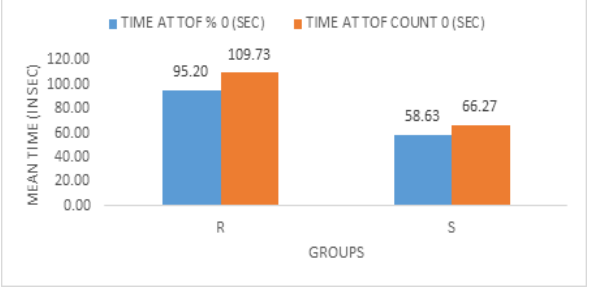


GRAPH 3

TIME AT TOF COUNT 0 AND TOF % 0

Parameters	R		S		t value	p value
	Mean	SD	Mean	SD		
TIME AT TOF % 0 (SEC)	95.20	14.991	58.63	8.364	11.667	0.000
TIME AT TOF COUNT 0 (SEC)	109.73	14.626	66.27	9.048	13.843	0.000

TABLE 5

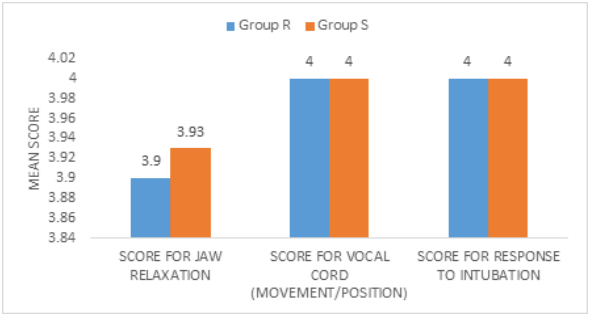


GRAPH 4

Assessment of intubating conditions:

Parameters	R		S		t value	p value
	Mean	SD	Mean	SD		
SCORE FOR JAW RELAXATION	3.90	.305	3.93	.254	-0.460	0.647
SCORE FOR VOCAL CORD (MOVEMENT/POSITION)	4.00	.000a	4.00	.000a	-	-

TABLE 6



GRAPH 5

DISCUSSION:

The ideal neuromuscular blocking agent is one which has brief duration of action, provides profound relaxation and is free from hemodynamic changes. Succinylcholine is the commonly used muscle relaxant for RSII due to its fast onset, excellent intubating conditions and short time course of action. However it may have adverse effects such as bradycardia, asystole, malignant hyperthermia, hyperkalemia, increased intraocular pressure, myalgia which can limit or even contraindicate its use at times.

Rocuronium, in doses of 0.6-1.2 mg/kg has proven to be as effective as succinylcholine 1 mg/kg in producing acceptable (good or excellent) conditions for rapid tracheal intubation. The purpose of the study was to know if low-dose rocuronium reduced its duration of action, yet gave acceptable intubating condition, permitting its use in cases where short apnoea time is desirable and succinylcholine is contraindicated. To evaluate overall intubating conditions, we used three parameters, ease of laryngoscopy, vocal cord position at laryngoscopy and response to tracheal intubation at train of four count 0.

In our study, the average time taken for TOF count to become 0 is 109.73±14.626 in rocuronium group and 66.27±9.048 in succinylcholine group.Intubating conditions were found excellent in both the groups.

CONCLUSION:

The onset of neuromuscular blockade is faster in the succinylcholine group compared to rocuronium group with excellent intubating conditions in both the groups.

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