



## A COMPARISON OF HEMODYNAMIC VARIABILITY BETWEEN ROCURONIUM BROMIDE AND SUCCINYLCHOLINE IN ADULT SURGICAL PATIENTS

### KEYWORDS

Hemodynamic variability, Rocuronium, Succinylcholine.

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### ABSTRACT

**Aim :** The aim of our study was to compare the hemodynamic effects of rocuronium versus succinylcholine during intubation in adult surgical patients. **Methodology :** All the patients were randomly divided into two groups of 25 each. Group I patients received Rocuronium Bromide 0.6 mg/kg and Group II patient received Succinylcholine 1.5mg/kg. The intubation was attempted at 90 seconds by an experienced anaesthesiologist blinded to the drug. Pulse Systolic Blood Pressure and Diastolic Blood Pressure were noted at predetermined interval. **Results:** There was no significant change in Pulse, Systolic Blood Pressure and Diastolic Blood Pressure from the baseline value after the administration of muscle relaxants in either of the groups. **Conclusion:** Rocuronium can be a better and safer alternative to succinylcholine for endotracheal intubation, particularly for surgery where bradycardia is hazardous.

### INTRODUCTION

Intubation is still considered the most critical step in providing safe anaesthesia. There are several muscle relaxants with varying potency and latency which were introduced to clinical practice but Succinyl choline is still widely used as a muscle relaxant of choice because of its shorter onset and duration of action. The advent of rocuronium bromide has challenged the long established authenticity of succinyl choline as muscle relaxant for intubation, but because of higher cost of rocuronium and longer duration of action, it has lost its relevance in resource limited remote settings. But it has regained entry into the market with reduction in cost as well as proven safety profile.

Succinylcholine with its rapid onset<sup>1,2</sup> and short duration of action<sup>1</sup> is still the drug of choice for rapid endotracheal intubation. With so many advantages there comes drawbacks of succinylcholine<sup>1</sup>- bradycardia, raised intraocular pressure, fasciculation, intracranial pressure, intra abdominal pressure, myalgia, hyperkalemia, cardiac arrhythmias and tendency of malignant hyperthermia.

Rocuronium is a low potency, intermediate acting derivative of vecuronium with shorter onset time than the other non-depolarizer. It is also devoid of cardiovascular side effects<sup>3</sup> and does not cause histamine release<sup>4,5</sup>.

Several studies<sup>6,7,8,9,10,11,12,13</sup> were undertaken to compare the intubating conditions of Rocuronium bromide with Succinylcholine with varying doses of rocuronium and succinyl choline but very few have been done to compare the hemodynamic variability. Hence we aim to compare the hemodynamic variability with minimal dose of rocuronium (0.6mg/kg) versus succinyl choline (1.5 mg/kg) used for intubation in adult surgical patients.

### METHODS

After obtaining informed written consent for surgery and general anaesthesia 50 patients of either sex, aged between 18-60 years of ASA grade I and II undergoing various surgical procedures were selected for the study. All patients underwent a thorough pre-anaesthetic check up, various routine and necessary investigations were carried out for any systemic disorder. Exclusion criteria included patients with potential

airway problem, pregnant patients, hepatic, renal, metabolic, neuromuscular disorder and those with allergy to any of the drugs used during general anaesthesia. The patients were randomly divided into two groups of 25 patients each. Group-I patients received Rocuronium Bromide in a dose of 0.6 mg/kg an intubating dose, and Group-II patients received Succinylcholine in a dose of 1.5mg/kg and intubated at 90 seconds in both group.

Premedication with Tab Alprazolam 0.5mg given at bed time on the day before surgery followed by over-night fasting. In the morning, patients were given injection Glycopyrrolate 0.2mg intramuscular half an hour prior to induction of anaesthesia.

On arrival to the operating room and IV access was established. Pulse and BP were recorded and were monitored for heart rate, ECG, NIBP, SpO<sub>2</sub> at 10 minutely interval.

Patients were pre-medicated with injection pentazocine 0.6mg/kg IV, preoxygenation was carried out for 3 min. The patient was then induced with injection Propofol 2mg/kg followed by muscle relaxant preserved for study, and patients were intubated at 90 seconds after muscle relaxants. Pulse, SBP and DBP were recorded Just Before Induction (Baseline value), Just After Relaxant, After Intubation, 5 Minutes After Intubation and were designated as (P1,P2,P3,P4), (SBP1,SBP2,SBP3,SBP4) and (DBP1,DBP2,DBP3,DBP4) respectively.

Anaesthesia was maintained with O<sub>2</sub>:N<sub>2</sub>O ::40:60, Halothane 0.5% on controlled ventilation by using bair circuit, subsequent relaxation was achieved by Atracurium Bromide. Reversal of neuromuscular block was carried out by using injection Glycopyrrolate .01mg/kg and Neostigmine 0.05mg/kg. Adverse effects, if any, were noted during intubation and thereafter.

### RESULTS

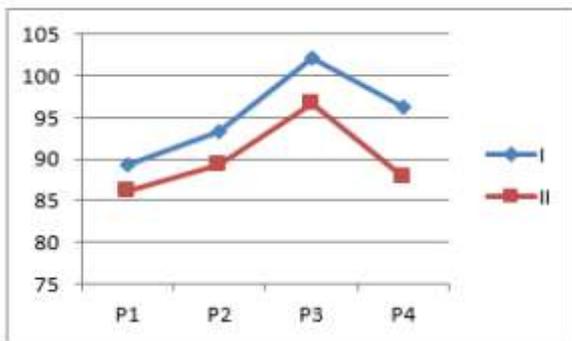
The demographic datas of the patients were comparable in both groups

**TABLE 1 : Demographic Data**

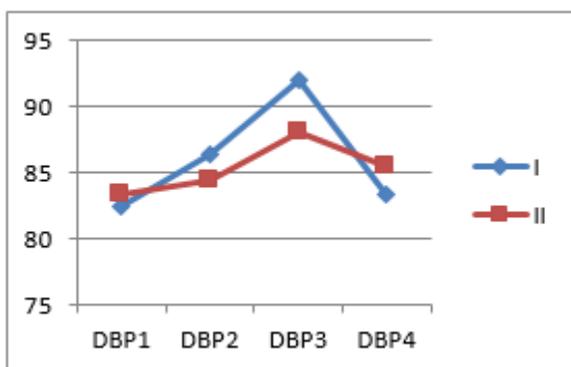
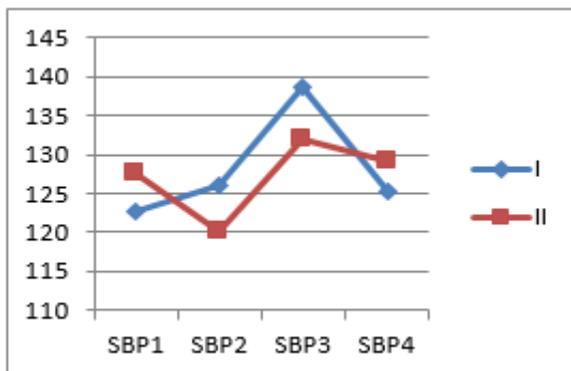
	Group I	Group II
Age(in years)	41.15±7.2	39.45±9.2
Sex(M:F)	19:6	20:5
Weight(kg)	52.15 ± 6.7	51.27± 8.4

No significant changes in pulse rate, systolic blood pressure and diastolic blood pressure were observed at the base line. However in the Rocuronium group(I) slight increase in pulse rate, systolic blood pressure and diastolic blood pressure was demonstrated after the administration of the relaxant and after intubation, but the difference was statistically insignificant ( $p > 0.05$ ). There was no adverse effect noted with either of the drugs.

#### Graphical representation of hemodynamic variability between Rocuronium (Group I) and Succinylcholine (Group II)



Graph 1: Change in pulse between two groups.



Graph 2 and Graph 3: Change in systolic and diastolic blood pressure between two groups.

#### DISCUSSION

In our study we used 0.6 mg/kg rocuronium and 1.5 mg/kg succinyl choline for intubation and waited for 90 seconds. Few study<sup>7,10</sup> used higher dose of rocuronium like 0.9 mg/Kg or 1.2 mg/Kg to reduce the intubation time but we believe it will unnecessarily increase the duration of action and hence is not acceptable in many clinical situations. Many studies<sup>6,8</sup> used the same dose of rocuronium as in our study. Similarly we

used succinyl choline in the dose of 1.5 mg /kg dose for comparing hemodynamic variability after using the two muscle relaxants for intubation.

We found that there is no significant difference in the hemodynamic variability between rocuronium and succinyl choline while using both for intubation.

The rocuronium group has shown non significant increase in pulse and blood pressure just after intubating dose of muscle relaxant and after intubation. The increase in blood pressure is probably linked to increase in pulse rate, which settles down to baseline level after 5 minutes of intubation. This demands further study to look for the cause of increase in pulse rate after rocuronium.

In our study, rocuronium shows similar hemodynamic stability when compared with succinyl choline for intubating a ASA I and II adult surgical patients. Similar observations were recorded by Cooper et al<sup>14</sup> and Toni Magorian et al<sup>7</sup> Aparna Shukla et al<sup>15</sup>. But further study is required to be done to evaluate the utility of rocuronium in sicker group of patients before declaring rocuronium a safer alternative to succinyl choline in emergency department, where usually sicker patients needs intubation. The other drawback of our study is that the study population is too small, hence further study with larger population is advocated to compare the hemodynamic variability between rocuronium and succinyl choline when used for intubation.

#### CONCLUSION

It is concluded that rocuronium can be a better and safer alternative to succinylcholine for endotracheal intubation, particularly for surgery where bradycardia is hazardous. Rocuronium should definitely be given preference over succinylcholine in conditions where use of succinylcholine is contraindicated or hazardous. Thus, rocuronium should be a good replacement for traditional succinylcholine for intubation in adult surgical patient.

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