

Research Article**Comparative Study of Cardiovascular Response and POGO scoring with McCoy, Machintosh and TruView EVO-2****Fauzia Rehman Khan¹, Pallavi Ahluwalia², Mohammad Aslam³, Dr. Arvind Kumar Morya⁴**¹Assistant Professor, Department of Anaesthesia, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India²Associate Professor, Department of Anaesthesia, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India³Assistant Professor, Department of Orthopedics, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India⁴Assistant Professor, Department of Ophthalmology, Teerthanker Mahaveer Medical College & Research Centre, Moradabad, Uttar Pradesh, India***Corresponding author**

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Abstract: To compare cardiovascular response and POGO scoring with McCoy, Machintosh and TruView EVO-2 laryngoscope. For this randomized prospective study 90 ASA grade I and II patient of either sex in the age group 20-50yrs, undergoing general anaesthesia for elective surgery were enrolled after approval by the ethical committee. 90 patients were divided randomly in 3 group with (n= 30) TE (Truview EVO-2), MT (Machintosh), MC (McCoy) laryngoscope for proposed surgery under general anaesthesia. Patients were evaluated pre operatively after uniform premedication, induction and relaxation all laryngoscopies were performed by experienced anaesthetist. Vitals were recorded at 1, 3 and 5 minutes respectively. POGO (Percentage of Glottic Opening) scoring was done as 100 for full glottis view and 0 as no portion of glottis visualized, by attending anaesthetist. TruView EVO -2 laryngoscope was best in POGO scoring followed by McCoy and then Machintosh. Time taken during laryngoscopy was more with TruView EVO -2 followed by McCoy and Machintosh in that order. Patients were more stable hemodynamically with TruView EVO -2 followed by McCoy and then Machintosh. TruView EVO -2 was found to be a better device in terms of POGO scoring and haemodynamic stability than McCoy and Machintosh laryngoscopes.**Keywords:** TruView EVO-2, McCoy, Machintosh, POGO scoring.

INTRODUCTION

Intubation is one of the basic procedures of anaesthesia. Airway management is the task which an anaesthesiologist encounters routinely. Frequency of difficult intubation is between 1.5 to 13%, which is a problem that requires prompt solution. So, different aids [1], devices and measures are used to maintain airway difficulty. Machintosh blade has been popular for laryngoscopy. Better laryngoscope has been developed to overcome difficult airway intubations. GlideScope, Pentax, and TruView, have aimed to improve laryngeal exposure through the use of optical apparatuses, lenses, and cameras that target anatomical obstacles [2, 3]. The TruView EVO -2 (Truphatek) development of new indirect laryngoscope enabled intubation with optic apparatus which does not need use of oral pharyngeal and tracheal axes alignment. TruView EVO-2 has previously been reported to provide a better laryngeal appearance through the use of its optical system which provides 42 degree deflection view through 15mm

eyepiece. In addition, the TruView EVO -2 reduces the problems associated with lens blurring by using a continuous O₂ flow system (4-5 L/min) attached to the laryngoscope [4-6]. Flexi tip McCoy laryngoscope was developed in early 1990 as an aid to difficult intubation [7]. Present study was conducted to compare the difference of laryngoscopic view by POGO scoring using Machintosh, TruView EVO 2 and McCoy as well as hemodynamic changes during laryngoscopy.

MATERIALS AND METHODS

The study was conducted with 90 adult patients belonging to ASA physical status I and II between the ages of 20 and 50 years, who were scheduled for elective surgery under general anaesthesia, requiring endotracheal intubation.

The approval for the study was obtained from the Institutional Ethics Committee and informed consent was obtained from all the patients.

Exclusion criteria for the study include patients not fasted for 8 h prior to surgery, rapid sequence intubation, anticipated difficult airway on preoperative assessment with Mallampati class III& IV, thyromental distance less than 6.5 cm and inter incisor distance less than 3.5 cm, pathology of oropharynx, larynx or mass in the neck that is likely to alter the anatomy of the airway, obese patients (body mass index >30), central nervous system disorders, intracranial space-occupying lesion or patients with features of raised intracranial tension or intraocular pressure and allergy to any of the drugs being used in the study.

Ninety patients were selected in a random manner and allocated to the TruView (TE), McCoy (MC) and Machintosh (MT) group, each with 30 patients by the "chit in a box" method. Ninety chits, 30 labeled TE and 30 labeled MC and 30 labeled MT were put into a box and after mixing, and were picked by the subjects and not replaced in the box. This simple method of randomization ensured equal allocation of cases to all the Truview, Machintosh and the McCoy groups. Use of the airway device and endotracheal intubation was performed by an anaesthesiologist who has at least 3 years of experience in anaesthesia and has performed at least 20 intubations in the clinical settings with all three devices. Patients were allocated by the "chit in box" method. All patients were kept nil per orally for 8 hrs prior to the surgery. They were premedicated with lorazepam 0.04 mg/kg orally the night before and 2 h prior to the surgery. In the operating room, preinduction monitoring was performed with a five-lead electrocardiogram, non-invasive blood pressure and a pulse oximeter. Appropriate intravenous access was secured. Premedication with Fentanyl 2 mcg/kg was given. The patients were pre-oxygenated with 6 L of oxygen for 5 min and general anaesthesia was induced with propofol titrated to induce anaesthesia in a dose sufficient to produce loss of response to verbal commands. Muscle relaxant vecuronium bromide 0.12 mg/kg was administered after checking adequacy of the mask ventilation. Mask ventilation with oxygen and isoflurane was done for 3 min. At the end of the 3 min, after confirming adequacy of block with a peripheral nerve stimulator, direct laryngoscopy was done with TruView, Machintosh or McCoy laryngoscopes as per their respective groups. Oxygen was connected to the True View blade and a flow rate of 5 L/min was kept to

prevent fogging. The trachea was intubated with an appropriate size cuffed ETT (7.0 in females and 8.0 in males). After successful tracheal intubation, the lungs were mechanically ventilated for the duration of the procedure and anesthesia was maintained with isoflurane in a mixture of N₂O and O₂. No other medications were administered or procedures performed during the 5-min data collection period after tracheal intubation. Subsequent management had been left to the discretion of the anesthesiologist providing care for the patient. The duration of the tracheal intubation procedure was noted. The duration of the intubation attempt is defined as the time taken from insertion of the blade between the teeth until the ETT is placed through the vocal cords, as evidenced by visual confirmation by the anesthesiologists. However, in patients in whom the ETT was not directly visualized as passing through the vocal cords, the intubation attempt was not considered complete until the ETT was connected to the anesthetic circuit and evidence obtained of the presence of CO₂ in the exhaled breath.

RESULTS

Demographic data was comparable with p value>0.05 in all the groups. All ninety patients selected were of either mallampatti I or II .The POGO scoring was best in TE group as compared to MT and MC group. POGO scoring was better in MC group as compared to MT. Laryngoscopy time taken was less in MT group as compared to TE and MC group. It took more time with TruView EVO-2 laryngoscope as compared to Machintosh and McCoy laryngoscope.

Heart rate (HR) and Systolic blood pressure (SBP) rose significantly under the stimulus of laryngoscopy and intubation in all the groups at 1 and 3 min. Unpaired T test for HR between MT and TE groups at 1 min and 3 min gave p value 0.002 and 0.015 respectively which is statically significant. T test applied between TE and MC for HR at 1 min and 3 min gave p 0.001 and 0.0001 respectively, which is highly significant. P value was not significant at HR at 5 min in all the three groups as shown in Table 2.

Systolic blood pressure was observed to rise significantly in all the group at 1min and 3 min with p values less than 0.05 as shown in table 2. Rise of blood pressure was insignificant at 5 minute. (p >0.05)

Table 1: Comparison with respect to age, weight, POGO and LT

Variables	MT	TE	MC
Age (Yrs)	32.7±7.5	32.86±6.4	32.9±6.6
Weight (Kg)	54.5±7.3	55.2±6.45	51.5±6.3
POGO (%)	77±11.6	98.6±6.7	83.7±7.5
LT(sec)	19.6±11.6	33.2±9.8	24.4±7.4

Table 2: Comparison with respect to HR

Variables	MT	TE	MC	p value		
				MT & TE	TE&MC	MC&MT
HR1	99.3±8.8	89.1±11	93.16±10.1	0.001	0.0004	0.00013
HR3	92.7±9.5	85.1±10.9	90.56±9.94	0.0001	0.0001	0.00015
HR5	88.9±7.6	83.1±10.1	87.53±9.75	0.531	0.99	0.15

Table 3: Comparison with respect to BP

Variables	MT	TE	MC	p value		
				MT & TE	TE&MC	MC&MT
BP1	176.2±12.3	143.1±8.08	140.4±9.4	0.000167	0.000192	0.000217
BP3	159.16±11.2	130.9±5.80	120.11±11.4	0.000233	0.000283	0.000333
BP5	140.4±8.06	139.17±8.24	128.73±10.5	0.5	0.345	0.19

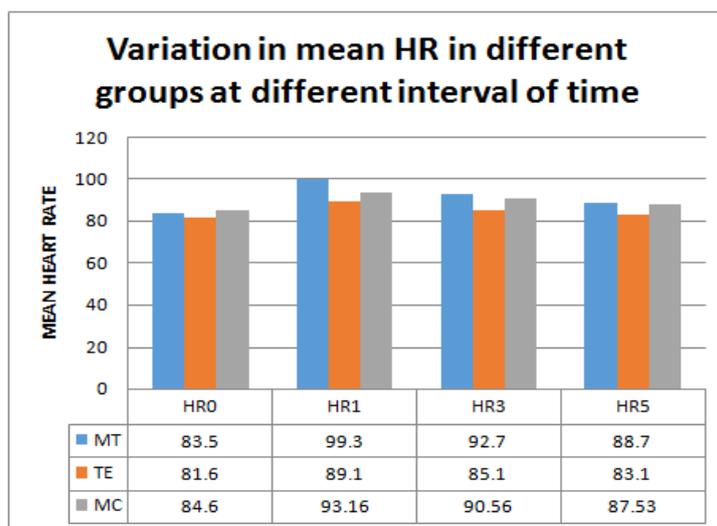


Fig. 1: Graphical presentation of mean heart rate in different group at 0,1,3 and 5 min, showing significant change in heart rate(HR) at 1 min and 3 min, while HR at 5 min was back to pre operative HR

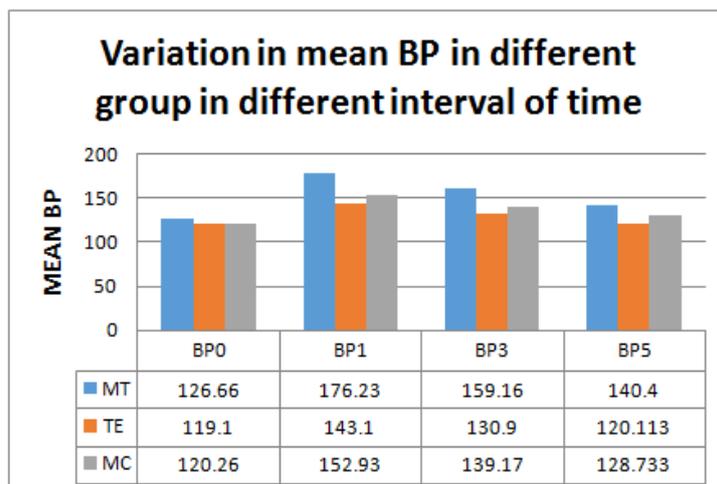


Fig. 2: Graphical presentation of mean systolic blood pressure (BP) at different intervals at 1, 3 and 5 min. There was significant rise in blood pressure at 1 min and 3 min after laryngoscopy in all groups. After 5 min BP was equal to pre operative value in TruView EVO-2 and McCoy group but it remained high in Machintosh group.

DISSCUSSION

It was found that the rise in blood pressure at the time of laryngoscopy is due to manipulation of orolaryopharynx. The change in blood pressure and heart rate is variable according to the type of device used for

intubation [9]. It was found that the rise in blood pressure is more in hypertensive patients with Machintosh laryngoscope as compared to lightwand [10]. The rise in blood pressure is also associated with the force required to do the laryngoscopy which is

proved by Rashid *et al.* [11]. POGO scoring was found better in TruView EVO-2 group as compared to Machintosh group. In this study POGO scoring was best in TruView EVO-2 group (98.6 ± 6.7) than McCoy (83.7 ± 7.5) as well as Machintosh (77 ± 11.6) group (P value < 0.05) but POGO score was better in McCoy group than Machintosh group (p value > 0.05) that was not statistically significant. TruView EVO-2 laryngoscope have better anterior visualization than the Machintosh and McCoy laryngoscopes as lifting force is less for visualization of glottic opening and hence have less changes in HR and blood pressure. McCoy has better visualization than Machintosh laryngoscope. Lieberman *et al.* [13] who supported that with TruView EVO-2 laryngoscope it took less force for visualization of glottis. In our study rise in blood pressure was statistically significant in all group at 1 min and 3 min just after laryngoscopy and was insignificant after 5 min in all groups. Regarding laryngoscopy time it was found that it takes more time in TE group compared to other groups. Earlier studies support this fact that it takes more time with TruView EVO-2 (33.2 ± 9.8) group due to hand to eye co-ordination and lack of experience. It took less time with Machintosh (19.6 ± 11.6) group than McCoy group (24.4 ± 7.4) It was found that anaesthetist are more experienced with Machintosh laryngoscope.

CONCLUSION

In conclusion, TruView EVO-2 laryngoscope has best POGO scoring and less hemodynamic changes compared to Machintosh and McCoy laryngoscope. But it took more time to intubate due to need of eye and hand co-ordination. Hemodynamic changes were less in McCoy group compared to Machintosh laryngoscope and POGO scoring was also better in McCoy as compared to Machintosh laryngoscope.

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