



COMPARISON OF TRACHEAL INTUBATION USING THE AIRTRAQ AND MC COY LARYNGOSCOPE IN THE PRESENCE OF RIGID CERVICAL COLLAR SIMULATING CERVICAL IMMOBILIZATION FOR TRAUMATIC CERVICAL SPINE INJURY

KEYWORDS

Airtraq, McCOY, MILS

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ABSTRACT Airtraq is a laryngoscope which helps in intubation during difficult airway. The advantage is that it doesn't require the alignment of oral, pharyngeal and laryngeal axis. On the other hand the McCOY also helps in same difficult scenarios because of its hinged tip.

AIMS AND OBJECTIVES

To evaluate the effectiveness of Airtraq, in comparison with the McCoy laryngoscope, when performing tracheal intubation in patients with neck immobilization using hard cervical collar with respect to following parameters.

1. Visualization of the larynx in both the groups.
2. Comparison of the time taken for intubation in each group.
3. Comparison of the difficulties in insertion in each group.
4. Comparison of the complications during intubation.
5. Comparison of the postoperative complication.

MATERIALS AND METHODS

Approval of the institutional committee has been obtained. Patients aged between 18-50 years, ASA grade I-II posted for elective surgeries under general anaesthesia in A. J. Hospital, Mangalore between December 2013 and October 2015.

SAMPLE SIZE -60

Patients were randomised in two groups

1. Group A-AIRTRAQ
2. Group M-McCoy

GROUP

The steps in the data collection were-

- Informed consent obtained from ASA I and ASA II patients.
- An appropriate sized rigid cervical collar placed as manufacturer's instruction.
- Measurement of the mouth opening before its application.
- A standard general anaesthesia and standard monitoring.
- Intubation was done with McCoy and Airtraq by anaesthesiologist with adequate experience.
- Difficulty of insertion with the McCoy or the Airtraq has been graded on Likert scale {very difficulty (-2), slightly difficulty (-1), not difficulty (0), easy (+1), very easy (+2)}
- Intubation time has been noted.
- The laryngoscopic views were graded with The Cormack-Lehane grading I-IV.
- Episodes of failure of intubation were noted.
- Number of attempts were noted.
- Complications during intubation like airway trauma and episodes of de-saturation were noted.

Post operative complications like laryngo spasm, hiccup, sore throat, nausea and vomiting has been noted.

The data collected was transferred into a master chart which is subjected to statistical analysis by the Biostatistician of our Institution. Demographic data are compared using the chi-square test. Categorical data like CL grading, Likert Scale, number of attempts, complication like airway trauma, sore throat, nausea/vomiting are compared using the chi-square test. Continuous variable like intubation time is expressed as mean + standard deviation and comparison using student t test. Laryngo-spasm is compared using the Fisher exact test. p value <0.1 is taken as significant.

7.2. SELECTION CRITERIA:

A. Inclusion Criteria.

1. ASA I or II
2. Age between 18 and 50 year
3. Undergoing elective surgery

B. Exclusion Criteria.

1. Mallampati grade III, IV
2. Mento-hyoid distance <3cm
3. Thyro-mental distance <5cm
4. Sterno-mental distance <10cm
5. Neck circumference >42cm
6. Obese (body mass index >30)
7. Patients with pulmonary aspiration of gastric contents
8. Pregnant patients
9. Patients with cervical spine pathology
10. Airway distortion
11. Mouth opening less than 2 finger

OBSERVATION AND RESULTS

1. COMPARISON OF AGE BETWEEN TWO GROUPS

*chi-square test

Result: comparison using chi-square test in which the p value is non-significant.

2. COMPARISON OF BASIC PARAMETERS BEFORE INTUBATION

	Group	N	Mean	Std. Deviation	Median	t value	p value
WEIGHT (kg)	Airtraq	30	58.93	10.34	59.00	1.063	.292
	McCoy	30	56.00	11.03	54.00		NS

	Total	60	57.47	10.70	56.00		
TMD(cm)	Airtraq	30	6.47	.51	6.00	.513	.610
	McCoy	30	6.40	.50	6.00		NS
	Total	60	6.43	.50	6.00		
SMD(cm)	Airtraq	30	12.57	.50	13.00	.000	1.000
	McCoy	30	12.57	.50	13.00		NS
	Total	60	12.57	.50	13.00		
PR	Airtraq	30	78.07	3.25	78.00	1.546	.128
	McCoy	30	76.57	4.21	76.00		NS
	Total	60	77.32	3.80	77.00		
SBP	Airtraq	30	127.67	22.08	122.00	1.132	.262
	McCoy	30	122.40	12.70	121.00		NS
	Total	60	125.03	18.06	122.00		
spo2(%)	Airtraq	30	99.50	1.36	100.00	.931	.356
	McCoy	30	99.13	1.68	100.00		NS
	Total	60	99.32	1.52	100.00		
Neck circumference	Airtraq	30	32.83	1.234	33	0.8962	.3739
	McCoy	30	32.47	1.234	32		NS
DBP	Airtraq		76.37	11.87	80	1.371	0.175
	McCoy		71.53	15.23	70		NS

*Unpaired t test

Result : Comparison of basic parameters done using unpaired t test is which the p value is non significant.

3.COMPARISON* OF GENDER OF BOTH GROUPS

*Chi-square test

Result:comparison done using chi square test and the p value appeared non significant

4.COMPARISON* OF CL GRADING

*chi-square test

Result: comparison done using chi-square test which appeared non significant

5.COMPARISON* OF TWO GROUPS USING LIKERT S

*Chi-square test

Result: comparison done using chi square test which appeared non significant.

6.COMPARISON* OF INTUBATION TIME BETWEEN TWO GROUPS

Group	N	Mean	Std. Deviation	Median	t value	p value
Airtraq	30	41.87	8.66	40.00	6.181	p<0.001
McCoy	30	28.50	8.08	27.50		HS
Total	60	35.18	10.70	35.00		

*unpaired t test

Result: comparison done using unpaired test and the p value appeared to highly significant.

7.COMPARISON* OF NUMBER OF ATTEMPTS BETWEEN TWO GROUPS

*Chi-square test

Result: comparison was done using chi- square test and the p value appeared non significant.

8.COMPARISON OF SUCCESS OF INTUBATION BETWEEN TWO GROUPS

	Group		Total
	Airtraq	McCOY	
SUCCESS Y	30 100.0%	30 100.0%	60 100.0%
Total	30 100.0%	30 100.0%	60 100.0%

9.COMPARISON* OF AIRWAY TRAUMA BETWEEN TWO GROUPS

*chi-square test

Result: comparison done using chi-square test and the p value appeared non significant.

10.COMPARISON OF POSTOP LARYNGOSPASM BETWEEN TWO GROUPS

*Fishers exact test p=.012, sig

Result: comparison done using Fishers exact test and the p value appeared significant.

11.COMPARISON* OF POSTOPERATIVE SORE THROAT EVENTS IN TWO GROUPS

*chi-square test

Result: comparison done using chi-square test and the p value appeared non significant.

12. COMPARISON* OF EPISODES OF DESATURATION BETWEEN TWO GROUPS

There were no episodes of de-saturation in both group.

13.COMPARISON OF HICCUP BETWEEN TWO GROUPS

There were no episodes of hiccup in both group.

14.COMPARISON* OF NAUSEA /VOMITING BETWEEN TWO GROUPS

*chi-square test

Result: comparison done using chi-square test and the p value appeared non significant

DISCUSSION

The current study was aimed at comparing the two laryngoscopes one the classic McCoy direct laryngoscope and the other Airtraq video laryngoscopes which is indirect and to see the efficacy of these in the operative room setting. The comparison was aimed at finding the difficulty of insertion, complication during intubation and postoperative complication occurring due to the process. Also the laryngoscopic grade is compared, following with which the data is analysed and tabulated. Likert scale were compared for the McCoy and the Airtraq. Even though result was no significant, the Airtraq appeared to have 23% of (-1) on LIKERT SCALE which meant it had more difficulty for insertion compared with the McCoy(13.3%). It might due to the bulkiness of the Airtraq when compared to the McCoy. Chi-square test was used to compare Cormack-lehane grading between the McCoy and the Airtraq. But the Airtraq Group had 76% of CL grading I, which meant that the Airtraq was better than McCoy(70%) in improving visualization. In case of Airtraq we require very less alignment of oro-pharyngeal and laryngeal axis. Airtraq with its built of prisms and mirrors improved the view even in the presence of edema or any restricted line of sight.

The intubation time was also measured between the Airtraq and McCoy group using unpaired- t test. It appeared that the McCoy(28.50sec) appeared to require less intubation time compared to Airtraq (41.87sec). It might be because of increased familiarity with McCoy laryngoscope.

By using chi-square test the number of attempts taken for intubation was compared between the Airtraq and the McCoy

group. Even though the result were non significant, the Airtraq (20%) appeared to need more no of attempts when compared to the McCoy (16.7%) which might be due to inadequate familiarity with the Airtraq.

Airway trauma occurred during intubation were compared between the Airtraq and the McCoy group, using Even though it was non significant, the Airtraq appeared to cause less airway trauma (6.7%), when compared to McCoy (16.7%) which might be due to less airway manipulation done while using Airtraq laryngoscopy.

Episodes of de-saturation during intubation were compared between two groups . There were no episodes of de-saturation in both groups. Using the Fishers exact test , laryngo-spasm were compared between two groups and it appeared that only McCoy (6) caused laryngo spasm of about 20% when compare to Airtraq .We suggest that the increased airway manipulation occurred more during the intubation which McCoy might have caused .It appeared that both the Airtraq and McCoy didn't cause any hiccup as postoperative complication. Studies were not available to specifically compare and contrast the occurrence of hiccup as postoperative complication with my studies. The occurrence of sore throat as postoperative complication was compared using chi-square test between the Airtraq and McCoy group. But Airtraq appeared to cause less sore throat (3.3%) than McCoy (6.7%). Again increased airway manipulation during intubation using McCoy may be the culprit for this. Using chi-square test, occurrence of nausea/vomiting was compared and the result was non significant, but the Airtraq appeared to cause less nausea and vomiting (3.3%) when compared to McCoy (6.7%). Specific studies were not available to compare with my study.

Airtraq when compared to the McCoy classical laryngoscope fared better in this group in Cormack –Lehane grading where as McCoy appeared to have better intubation time compared to the Airtraq. McCoy had less difficulty in insertion compared to the Airtraq. Even though the Airtraq takes more time for intubation, there is no episodes of desaturation.

The improved CL grading with Airtraq proved less manipulation and less number of complication. In difficult intubation cases where glottic exposure is the problem, Airtraq maybe very useful for success of intubation. It may reduce the number of failed intubation. However, further studies are needed to prove this hypothesis. Airtraq caused less complication compared to the McCoy because intubation with McCoy laryngoscope required more amount of manipulation on airway. We suggest that amount of glottic exposure required in difficult intubation is the most important variable which we should give more attention. According to us, the intubation time which required more for Airtraq might be due to less expertise. With advanced training and frequent usage in future, Airtraq can be a better modality for difficult intubation scenarios.

There are some pitfalls in the study such as

1. Very small sample size.
2. Only MP I and MP II is taken.
3. Increased frequency in usage of McCoy than Airtraq.

SUMMARY

LIKERT SCALE were compared for McCoy and Airtraq, the p value appeared 0.438 which was non significant. Even though the result was non significant, the Airtraq appeared to have 23% of (-1) on LIKERT SCALE, which meant, it had more difficulty for insertion compared with the McCoy (13.3%).

Cormack-Lehane grading was compared for McCoy and Airtraq for which the p value was 0.559 which appeared non significant. But the Airtraq Group had 76% of CL grading I which meant that, the Airtraq was better than the McCoy (70%) in improving visualization. Intubation time was also measured between the Airtraq and McCoy group using unpaired- t test . For which the p

value appeared highly significant (<0.001) . It appeared that McCoy (28.50sec) required less intubation time compared to Airtraq (41.87sec). Attempts took for intubation was compared between Airtraq and McCoy group and p value was 0.739, which was non significant. Even though result was non significant the Airtraq (20%) appeared to need more number of attempts when compared to the McCoy (16.7%). All complication during intubation and post operative complication occurred were due to McCoy which have occurred due to increased manipulation compared to the Airtraq.

CONCLUSION

In this study ,the McCoy laryngoscope was easy to introduce where as Airtraq appeared to improve glottic exposure and also reduced complication both during intubation and postoperative complication.

Study done on 60 patients, with 30 patients in McCoy laryngoscope, 30 patients in Airtraq laryngoscopes, with the results thus obtained, like to conclude with:

1. Using Airtraq visualization of glottis is better and easier as neck extension is not required when compared to the McCoy laryngoscope in unanticipated difficult airway.
2. Intubation is quicker in McCoy when compared to the Airtraq laryngoscopes. But there are no episodes of desaturation in both.
3. Complication during intubation and post operative complication were more with McCoy than Airtraq and it might be due to increased manipulation .

Airtraq is a better alternative to McCoy in patients with difficult intubations due to cervical spine injury, but training is required before performing attempts on the patient.

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