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EVALUATION OF MEDICAM VIDEOLARYNGOSCOPE WITH D BLADE FOR LARYNGEAL VIEW AND EASE OF INTUBATION WITH IN LINE NECK STABILIZATION IN CERVICAL SPINE PATIENTS.

Anaesthesiology

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ABSTRACT

Background and Aims: Intubation in patients with cervical spine injury with inline neck stabilization is difficult, if we can get Gadgets which can be helpful to use for intubation would be good for us.The porpoise of this study to evaluate the laryngeal view and ease of intubation using Medicam videolaryngoscope with D blade for tracheal intubation in cervical spine patients with in line neck stabilization.

Methods: This is the prospective observational study which was undertaken in tertiary care hospital operation theatre after approval from institutional review board.A total of 50 patients of both sexes with 20 to 80 years of age who satisfy inclusion and exclusion criteria were taken in the study.Intubation was done with Medicam videolaryngoscope using D blade with in line neck stabilization.Laryngeal view was seen on Videoscreen and Cormack Lahane score was calculated and again seeing in patients oral cavity Cormack Lahane was calculated.Time required for intubation, external laryngeal pressure required,Fruva used were noted.Hemodynamics preop, during laryngoscopy and after laryngoscopy were noted.Statistical analysis was conducted using MS-Excel 2007 and analysed using SPSS -16 software.P value less than 0.05 was considered stastically significant.

Results: Cormack Lahane score with indirect Laryngeal view was Grade 1 in 37 patients(74%), Grade 2 in 12 patients (24%), External laryngeal pressure was required in 41 patients (82%).44 patients required fruva that is 80%. Intubation time in seconds was 89.7+-18.9 (mean +- SD)range was 45 to 150 seconds. Hemodynamic parameters showed during laryngoscopy Heart rate was 94.3+-7.5 and P value less than 0.001.Systilic blood pressure was 144.6+-11.7 with P value less than 0.001.Diastolic Blood pressure was 95.8+-6.0 with Pvalue less than 0.001.

CONCLUSION: Laryngeal view is better with Medicam Videolaryngoscope but intubation requires skill and practice as intubation is difficult using D blade.

KEYWORDS

Medicam videolaryngoscope, D blade, intubation time, hemodynamic response, Cormack Lahane score.

INTRODUCTION :

Patients with cervical spine injury may also be encountered in elective situations such as planned cervical spine surgeries[1]. Several alternative intubation devices exist that provide a better glottis view and require less skill for intubation[2]. If airway is not managed properly in cervical spine patients it may lead to dangerous neurological injuries .International guidelines say that not to move the patients head while intubation and maintain it with inline neck stabilization.[3] [4].Because of immobilization of head in cervical spine patients intubation becomes difficult and chances are failure are more.[5][6]. Fiberoptic bronchoscope can be used in patients with cervical spine injury for intubation.[7]. In awake fiberoptic intubation and self positioning of patients there risk of cervical spine injury.[8] However it requires skill and it is time consuming also and also requires patient cooperation.Recognising these problems in cervical spine patients it has lead to the invasion of different videolaryngoscopes.[9][10][11]. Medicam videolaryngoscope is one of that. Medicam videolaryngoscope consists of a screen with digital camera ,in built light source near the tip due to which we can see vocal cords and laryngeal view on screen.[12].We are using D blade which has a curvature facing upwards distally.[13] Because of this curvature glottis view can be seen without the alignment of oral,pharyngeal and treacheal axis.Dblade with medicam videolaryngoscope requires less cervical spine movement.[14].Literature tell that there are lots of studies using different laryngoscopes but so far there is no study using Medicam videolaryngoscope using D blade in cervical spine patients so we have under taken the study.

MATERIALAND METHODS:

It is a prospective observational study.50 patients were included in the study satisfying inclusion and exclusion criteria.

Inclusion criteria was Age 20 to 80 years .Patient with both sexes were included in the study.ASA 1 to ASA 3 were included.Patients with cervical spine injury for spine surgery were included.

Excluson criteria was Mallampatti grade 4, abnormal dentition, thyromental distance more than or equal to 6 cm,bleeding tendency, obesity,pregnant patients,Cardiovascular and respoiratory disease.

Complete evaluation of the patient was done before the start of the study.Written informed consent wa s taken preoperatively from all the patients who were undergoing elective surgery.After written informed consent Mallampatti grading of all patients is noted.Then patient is taken on table in operation theatre,all the moniters are attached, Intravenous line of 20G is secured in all the patients.Baseline heart rate,Blood pressure and saturation are noted.All patients are premedicatied with injection glycopyorolate 0.2 mg intravenously and injection fentanyl 50 microgram intravenously.Again heart rate,blood pressure and saturation are noted on the moniter after premedication. All the patients are induced with injection Thiopental 200 mg intravenously slowly.After induction again heart rate,blood pressure and saturation are noted.After induction one person holds the head of the patient in neutral position from side of table.After induction check ventilation is done then injection Vecuronium 4 mg is given intravenously.Patient is ventilated with oxygen,nitrous oxide and sevoflurane for 3 minutes.After 3 minutes D blade which is attached to Medicam videolaryngoscope is inserted into oralcavity and laryngoscopy is done.Hear rate,blood pressure and saturation is checked during laryngoscopy and 5 and 10 minutes after laryngoscopy.During laryngoscopy best glottis indirect view using Medicam is noted with Cormack Lahane grade,external laryngeal manipulation required,fruva used or not is noted.Time taken for laryngoscopy is noted,apnea interval is noted and number of attempts required is also noted.Any adverse events such as sore throat,soft tissue injury,arrhythmias,hypoxia is noted.Failure to intubate was noted if patient intubated after 2 attempts and required to leave the head by the person who holds it.Primary outcome was calculated as glottis view,time required to intubate,number attempts and any supralaryngeal pressure required,fruva or stylate required.secondary outcome was heart rate,bloodpressure and saturation after laryngoscopy and intubation.

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Statistics:

The data was entered using MS Excel 2007 and analysed using SPSS 16 software.Discreptive analysis for numerical data consists of frequencies and percentage for various parameters.Following

statistical tests of significance are used. Kolmogorov Smirnhov test used to check the distribution of data.Repeated measures ANOVA test is used for comparision of mean of haemodynamic variables recorded at preop,premedication,during and after laryngoscopy. The P value less then 0.05 was taken stastitically significant.

RESULTS:

Demographic details of study subjects (N =50) showed for age was mean and standard deviation 41.8+-13.7.Range of the age was 18 to 70 years. Laryngeal view parameters were studied by medicam laryngoscope using D blade which was decided by Cormack Lahane indirect view which showed Cormack Lahane was Grade 1 in 37 patients (74%) Grade 2 in 12 patients (24%)[Table/Fig-1]. This showed that the view was superior by Medicam laryngoscope as compared to direct view the Cormack Lahane grade was 4 in 29 patients (58%) and grade 3 in 18 patients (36%) [Table/Fig-1].This shows indirect view is better with Medicam laryngoscope. Parameters for ease of intubation studied were External laryngeal pressure required ,number of attempts, Frova used or not, Time required for intubation. Study showed that external laryngeal pressure was required in 41 patients out of 50 (82%) which was significant [Table/Fig-1].

[Table/Fig- 1].

Variables (N=50)	Summary	
MPC	**1** **2** **3**	9 (18.0) 23 (46.0) 18 (36.0)
Cormack Lehane Indirect view	**1** **2** **3** **4**	37 (74.0) 12 (24.0) 1 (2.0) 0
Cormack Lehane after direct view	**1** **2** **3** **4**	0 3 (6.0) 18 (36.0) 29 (58.0)
External laryngeal pressure required		41 (82.0)
No. of attempts	**1** **2**	16 (32.0) 34 (68.0)
FRUVA		44 (8.0)

Study of Ease of intubation parameters. MPC-Mallampatti classification

[Table/Fig-2] . Study of Ease of intubation parameters.

Variables (N=50)	Summary Mean ± SD (Range)
Laryngoscopy time (sec.)	42.5 ± 7.7 (30-60)
Intubation time (sec.)	89.7 ± 18.9 (45-150)
Apnoea time (sec.)	89.7 ± 18.9 (45-150)

[Table/Fig-3]. Study of hemodynamic parameters, Heart rate. (N=50)

	Time	Mean ± SD	P value	Significance
Heart rate	**Preop**	78.9 ± 8.3	-----	-----
	After premedication	78.4 ± 4.9	1.000	Not significant
	During laryngoscopy	94.3 ±7.5	**< 0.001**	**Significant**
	5 min. after laryngoscopy	87.9 ± 7.0	**< 0.001**	**Significant**
	10 min. after laryngoscopy	76.5 ± 5.7	0.376	Not significant

(Repeated measures ANOVA with Bonferroni's post hoc test)

[Table/Fig-4]. Study of Hemodynamic parameter Systolic Blood Pressure .BP-Blood Pressure, SD-Standard Deviation.

	Time	Mean ± SD	P value	Significance
Systolic BP	**Preop**	123.2 ± 11.3	-----	-----
	After premedication	121.3 ± 10.5	0.477	Not significant
	During laryngoscopy	144.6 ± 11.7	**< 0.001**	**Significant**
	5 min. after laryngoscopy	136.1 ± 11.7	**< 0.001**	**Significant**
	10 min. after laryngoscopy	120.9 ± 8.7	0.649	Not significant

(Repeated measures ANOVA with Bonferroni's post hoc test)

[Table/Fig-5]. Study of Diastolic Blood Pressure.

	Time	Mean ± SD	P value	Significance
Diastolic BP	**Preop**	78.3 ± 7.9	-----	-----
	After premedication	76.7 ± 5.9	0.971	Not significant
	During laryngoscopy	95.8 ± 6.0	**< 0.001**	**Significant**
	5 min. after laryngoscopy	88.7 ± 5.9	**< 0.001**	**Significant**
	10 min. after laryngoscopy	76.5 ± 7.4	1.000	Not significant

(Repeated measures ANOVA with Bonferroni's post hoc test)

[Table/Fig-6]. Study of Oxygen saturation. (N=50). SPo2-Oxygen saturation.

	Time	Mean ± SD	P value	Significance
SPO2	**After premedication**	99.26 ± 0.4	-----	-----
	During laryngoscopy	99.12 ± 0.3	**0.041**	**Significant**
	5 min. after laryngoscopy	99.12 ± 0.3	**0.041**	**Significant**
	10 min. after laryngoscopy	99.12 ± 0.3	**0.041**	**Significant**

(Repeated measures ANOVA with Bonferroni's post hoc test)

Study showed 34 patient out of 50 required second attempt (68%) which is significant[Table/Fig-1]. Study showed that 44 patients required Frova (90%) which is significant[Table/Fig-1]. Intubation time in second was Mean +- SD(range) 89.7+-18.9 (45 to 150) which is also significant[Table/Fig-2]. Studiying all these parameters showa that the intubation is difficult with Medicam using D blade. Time required for intubation is also large. Hemodynamic parameters were also studied during laryngoscopy which showed that there was significant increase in heart rate during laryngoscopy was 94.3+-7.5 and P value was less than 0.001 which was significant [Table/Fig-3]. Systolic Blood pressure was 144 +-11.7. P was less than 0.001 was significant [Table/Fig-4]. Diastolic blood pressure was 95.8+-6.0. P value was less than 0.001 was significant[Table/Fig-5]. This showed that there was significant change in Hemodynamic parameters during laryngoscopy using Medicam using D blade.

DISCUSSION:

The primary aim of our study was to see the laryngeal view and ease of intubation using Medicam videolaryngoscope with D blade while performing tracheal intubation in adult patients using manual inline stabilization in cervical spine patients producing difficult intubation. Our secondary aim was to see the hemodynamic changes produced by D blade during laryngoscopy and intubation. With stimulated inline neck stabilization we produced difficult intubation and as all the patients of cervical spine injury it was not feesable to move the neck during intubation. Laryngoscopy with Medicam laryngoscope using D blade the indirect Cormack Lahane score was Grade 1 and 2 in 37 and 12 patients which shows that laryngeal view using Medicam was of good quality[Table/Fig-1]. Tracheal intubation using D blade showed that in difficult airway laryngoscopy time required was quite large than normal intubation time 86.7+-18.9 seconds (45-150). We also required external laryngeal pressure and Fruva in maximum number of patients[Table/Fig-1]. Hence it shows that intubation is difficult with D blade using Medicam videolaryngoscope. The hemodynamic response is also present with D blade during laryngoscopy. Again the curvature of D blade is more so we have the difficulty in inserting the blade in oral cavity. There are no studies on Medicam vediolaryngoscope using D blade for laryngoscopy and intubation in cervical spine patients. Although many people have used different types of videolar yngoscopes in different types of cases and compared with Macintosh laryngoscope. Savoldelli et all [15] Piepho et all [16] and Burdett et all [17] found in Manakin studies that in difficult aieway McGrath videolaryngoscope offered bedder laryngoscopic view using Cormac Lahane grading as compared with Macintosh laryngoscope. They showed that using McGrath videolaryngoscope the image of glottis is captured near the tip of blade. Gerling MC and et all showed that manual inline stabilization results in less cervical subluxation and allows better vocal cord visualization . The Miller laryngoscope blade

allows less axial distraction then the Macintosh blade.[18]. Serockei G and et all told that both videolaryngoscope C MAC D blade and Glidescope comparably enable excellent visualition of glottis opening resulting in high intubation success rate ,Both videolaryngoscopes can be used for difficult intubation.[19] In our study the laryngeal view using Medicam video laryngoscope was good with Cormac and Lahane. Barak et all [20] and Nasim et all [21] found that Trueview EVO2 laryngoscope took significantly longer time for intubation than Macintosh laryngoscope when used cervical spine rigidity. In the above study the author told that the tube needs to be advanced blindely until its tip enters the Trueview visual field there after the tube should be introduced through the vocal cords looking at the lense which requires good hand eye coordination. Shravanalakshmi and et all studied comparision of intubation success and glottis visualization using King vision C- MAC videolaryngoscope in patients with cervical spine injuries with cervical immobilization . It showed that both the videolaryngoscopes provide good glottis view and first attempt intubation success rate.[22]. In our study also the time taken for intubation was quite significant 89.7 +-18.9 seconds (45-150) [Table/Fig-2]. In our videolaryngoscope also we have to have good hand eye coordination and have to intubate using external laryngeal pressure and Fruva by looking at the screen at the top of laryngoscope. None of the patients had desaturation .SPO2 was 99 -100%[Table/Fig-6]. None of the patients had any complication or trauma. The exposure of glottis during laryngoscopy requires the elevation of the epiglottis by a forward and upward lifting force of the laryngoscopic blade which is associated with increase in heart rate and blood pressure secondary to sympathetic discharge. This hypertensive response is directly proportional to the amount of lifting force [23] and duration of laryngoscopy and intubation [24]. Hemodynamic response using Medicam videolaryngoscope using D blade was significant in our study [Table/Fig- 3,4,5]. Heart rate also increased during laryngoscopy. [24][25]. Heart rate was 94.3 +- 7.5 with P value less than 0.001[Table/Fig-3]. Systolic blood pressure was 114.6 +- 11.7 with P value less than0.001 [Table/Fig-4]. Diastolic blood pressure was 95.8 +- 6.0 with P value less than 0.001 which was significant. [Table/Fig-5]

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