



GLIDESCOPIC SUPERIORITY DURING OROTRACHEAL INTUBATION IN COMPARISON TO DIRECT LARYNGOSCOPY

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ABSTRACT

The aim of this study was to compare the hemodynamic changes during video laryngoscopy (glidescope) and the conventional method of direct laryngoscopy.

Objective: Hemodynamic changes during intubation are extremely important especially in patients with a history of coronary artery disease and arrhythmia.

Study Design: Randomized double-blind clinical trial.

Methods: This clinical trial recruited 200 male patients undergoing elective orthopaedic surgery. Heart Rate (HR) and Mean Arterial Blood Pressure (MABP) were measured before, at the time of induction and every minute for 10 minutes following intubation.

Results: Changes of MABP were significantly less in the glidescope group compared to direct laryngoscopy group ($p=0.001$). No significant change was observed between the HR of the two groups.

Conclusion: Glidescopic method of orotracheal intubation is considered advantageous over the conventional method for its less alteration of MABP.

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INTRODUCTION

Hemodynamic changes of patients during induction of anesthesia and intubation, especially in patients with coronary artery disease and arrhythmia, are very important (Kaplan, 1991). Direct laryngoscopy is the most widely used method of orotracheal intubation which, at the same time, could be very difficult making the situation more obstinate (Kabrhel, 2007). Glidescope video laryngoscopy (Fig-1&2) is a new technique in which a digital camera and a source of light are mounted on the end of the blade. It provides a clear view of the larynx during intubation (Mihai, 2008). In recent decades, video techniques are used in different endoscopic methods providing a better anatomical view, delineating anomalies and facilitating team cooperation.

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This advantage is absent in conventional laryngoscopy making the cooperation of the assistant more difficult (Sedrakyan, 2004). Although it is shown in several studies that video laryngoscopy provides a better view of the upper airways thus facilitating the orotracheal intubation compared to the conventional laryngoscopy method, its hemodynamic effects remains elusive (Xue, 2008; Kim, 2008 and Jones, 2008). The aim of this study was to compare the hemodynamic effects of video laryngoscopy and direct laryngoscopy.

MATERIALS AND METHODS

This study was a double-blind randomized clinical trial

The procedures and the whole study had been approved by the *Ethical Committee of Zahedan University of Medical Sciences* and informed consent was obtained from patients before enrollment. The study was conducted according Helsinki

Declaration. Two hundred patients (ASA Class I and II) were divided into two groups each consisting of 100 patients. The two studied groups were undergoing glidescope laryngoscopy and conventional laryngoscopy respectively. Patients were in the age range of 16-60 and had not received general anesthesia before. Patients were all admitted for elective orthopedic surgery of upper or lower limbs receiving general anesthesia and orotracheal intubation. Patients were matched according to age, time of being NPO, method of anesthesia and size of orotracheal tube.

Exclusion criteria were

- 1) ASA III and IV,
- 2) Previous history of surgery with orotracheal intubation,
- 3) Upper Respiratory Airway Infection and Diseases,
- 4) Emergency surgery,
- 5) Failure of intubation on the first try or procedure taking more than 30 seconds.

After admission to the operating room and re-checking the access to veins, general anesthesia was induced using thiopental 5 mg/kg, fentanyl 2 mcg/kg, lidocaine 1 mg/kg and atracurium 0.5 mg/kg. After mask ventilation using 100% Oxygen, 4th year resident of anesthesiology acquitted with both methods performed the intubation using either the conventional laryngoscopy or video laryngoscopy. Mean Arterial Blood Pressure (MABP) and Heart Rate (HR) were measured using Helike (Helike Instruments, SMU 610, USA). The measurements were recorded by trained research assistants before, at the time of induction and every minute for 10 minutes following intubation.

The collected data were analyzed using the t-test by SPSS Program

RESULTS

As shown in (Table 1), HR changes in glidescopy group was 21.42 and its changes were found to be 21.55 in direct laryngoscopy group. These changes are not statistically different between the two groups ($p=0.93$).

Table 1. Heart rate changes between the two studied groups

Method	Mean	Median	Min	Max	p-value
Glidescopy	21.42	20	3	67	
Direct Laryngoscopy	21.55	22	-17	42	0.93

Table 2. Mean Arterial Blood Pressure changes between the two studied groups

Method	Mean	Median	Min	Max	p-value
Glidescopy	8.3	8	-9	26	0.001
Direct Laryngoscopy	11.87	11	-2	37	

MABP was 8.3 in glidescopy group and 11.87 in direct laryngoscopy patients (Table 2). This is a significant change showing less MABP changes in glidescopy group compared to direct laryngoscopy group ($p=0.001$).

DISCUSSION

Changes in HR and MABP were prominent during intubation and in the first two minutes following the procedure. Measurements out of the mentioned period were not different from their basal records. Our study comprises more patients in

comparison to others but is selective for cases entering the study from the matching category of orthopedic diseases.

Rai MR in 2005 performed comparison between glidescopy and the conventional method and found glidescopy to be efficient during intubation providing a better view of the larynx thus facilitating the process. This is more pronounced in patients with difficult intubation due to inconvenient anatomy (Rai, 2005). In Another study *Maharaj CH et al* found that changes in the light source and increasing the curvature of the blade reduced hemodynamic fluctuations because providing a better view (Airtrag) decreases rate of manipulations.⁹ An investigation on nasotracheal intubation in 60 patients divided in 3 group found that the highest rate of hemodynamic changes occur in fiber optic bronchoscopy group. Conventional laryngoscopy occupies the second rank and glidescope creates the least changes in hemodynamic parameters (Li, 2007). In a trial which took part in China, no significant difference was found in the hemodynamic changes of the 30 glidescopically and 27 conventionally intubated patients while glidescopy took longer to be performed.¹¹ A larger study published in September 2007 in the same country on 91 patients reported significant increase in HR and blood pressure during orotracheal intubation but there is no definite report of alterations in hemodynamic parameters. It is suggested that standard anesthetic regimens can suppress the changes in the blood pressure but clearly it could not decrease the tachycardia induced during the glidescopic method. What this study shares with the previous ones is the ease of intubation and creating of a better view in the glidescopic method of patients with difficult intubation (Xue, 2007). Same hemodynamic changes were found in 56 Chinese patients undergoing orotracheal intubation with two methods of glidescopy and fiber optic bronchoscopy in 2006 (Xue, 2006). Most recent studies have found higher rates of success along with ease and shortness in nasotracheal intubation using the glidescope (Xue, 2007 and Xue, 2007). Glidescopy though easier does not decrease the movements which are made to the neck during the procedure (Xue, 2006). Although it is generally accepted that glidescopy provides a better view of the larynx and thus facilitating the intubation especially in patients with difficult intubation no consensus exists on its hemodynamic effects. Some studies show decreased changes in hemodynamic parameters, yet others prove no difference compared to the conventional method but in any case, no study could be found reporting the inferiority of this technique to the conventional method. Experience of anesthesiologists using different methods is a potential source of controversy in reporting the hemodynamic effects of glidescopy.

Conclusion

It is concluded that using glidescopic method of orotracheal intubation is of superior to the conventional method for its less alteration of MABP. And beside suggesting this study in larger scale we suggest using it as a good alternative specially for patients with compromised hemodynamic stability due to different underlying pathology.

Disclosure: The authors declare no conflicts of interest.

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