

Short Communication

Comparison of successful intubation with two different blades of laryngoscope: single-use and reusable

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Abstract

BACKGROUND: Many types of single-use blades are manufactured with different designs and materials. There have been several reports of difficulties in obtaining a view of the glottis with single-use laryngoscopes. The purpose of this prospective study was to compare the quickness and the success rate of endotracheal intubations with two different laryngoscope blades: disposable laryngoscope blades and reusable laryngoscope blades.

METHODS: The study included 200 patients aged 18 to 70 who were admitted to the operating room of the Ali-Ebne Abitaleb Hospital in Zahedan. The patients were randomly divided in two groups. Disposable laryngoscope blades were used for the first group and reusable laryngoscope blades were used for the second group. The endotracheal intubation duration and the failure rate of the intubation were assessed in the two groups.

RESULTS: No failures and prolongations of intubations were found in the reusable laryngoscope blades group compared with 21% incidence of prolonged intubations and 14% incidence of failed intubations in the prolonged intubations group which led to change of the laryngoscope by the anesthetists ($P < 0.05$).

CONCLUSIONS: The single-use laryngoscope blades appear to be efficient devices because they do not modify the ease of endotracheal intubation in most cases. Nonetheless, for difficult intubations it is advised to maintain conventional laryngoscopes in reserve.

KEY WORDS: Single-use blade, reusable blade, laryngoscope, tracheal intubation.

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Intubation of the trachea has been a risky cross-contamination procedure in the past decade because no perfect decontamination procedures existed. Infectious agents which are found in the laryngoscopic devices, have the potential for devastating spread of the human immunodeficiency virus, hepatitis viruses B and C and transmissible non-conventional agents¹. There has been an increase in the number of available disposable laryngoscope blades with the emergence of Creutzfeldt-Jakob disease and the discovery of prions in tonsillar material². Many types of single-use

blades are manufactured with different designs and materials. There have been several reports of difficulties obtaining a view of the glottis with the single-use laryngoscopes. However these equipments have not yet been evaluated formally³. The purpose of this prospective study was to compare the quickness and the success rate of endotracheal intubations with two different laryngoscope blades which are disposable laryngoscope blades and reusable laryngoscope blades under normal intubating conditions.

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Methods

Five anesthetists with different grades and experiences were asked to measure the duration of endotracheal intubation with two different laryngoscope blades and to complete a questionnaire on the ease of their use. The study included 200 patients aged 18 to 70 who were admitted to the operating room of the Ali Ebne Abitaleb Hospital in Zahedan in the year 2006. The current prospectively designed study was approved by the Ethics and Clinical Studies Committee of Zahedan University of Medical Sciences and the signed consent forms were obtained from all the patients who were enrolled in the study.

The patients were selected randomly by numbered containers and they were divided in two groups. Disposable laryngoscope blades were used for the first group and reusable laryngoscope blades were used for the second group. Drugs used for the induction of anesthesia were included fentanyl 2 µg/kg, thiopentone 4 mg/kg and atracurium 0.6 mg/kg. The incidence of prolonged time of intubations (more than one minute) and the rate of changes of laryngoscope by the anesthetists were recorded.

Data analysis was performed by t test with SPSS 11 for windows.

Results

There were no failures and prolongations of intubations in the reusable laryngoscope blades group, compared with a 21% incidence of prolonged intubations and 14% incidence of failed intubations that were found in prolonged intubations group which led to change of the laryngoscope by the anesthetists ($P < 0.05$).

Insertion in the mouth was considered as easy in all the patients and the visualization was rated as satisfying in 85% of the cases for disposable laryngoscope blades and 100% for reusable laryngoscope blades by the anesthetists.

Table 1. Patients characteristics and duration of surgery.

Characteristics	Disposable	Metallic
Age (year)	32.6 ± 13.3	35.3 ± 15.1
Women (all patients)	31/100	26/100
BMI (kg/m ²)	27.29 ± 2.14	27.41 ± 2.18
BMI > 28 (all patients)	42/100	40/100
Patients with abnormal denture (n)	12	15

Table 2. The distribution of patients based on kind of surgery.

Kind of surgery	Disposable	Metallic
Urology	8	11
General surgery	34	42
ENT	21	10
Orthopedic surgery	22	33
Trauma*	15	4
Total	100	100

*Excluding trauma of head and neck.

Table 3. Duration of intubation according to blade of laryngoscope.

Blade kind	Duration (seconds)	P Value
Metallic	12.45 ± 2.37	
Disposable	25 ± 5.8	0.0001

Table 4. Duration of intubation among patients with different BMI.

Characteristics	Disposable	Metallic	P value
Patients with BMI < 28	11.68 ± 2.26	13.0 ± 2.52	0.01
Patients with BMI > 28	38.8 ± 9.3	15.33 ± 3.0	0.0001

Table 5. Duration of intubation among patients with abnormal denture.

	Disposable	Metallic	P Value
Normal denture	25 ± 6.4	11.82 ± 2.2	0.0001
Abnormal denture	23.3 ± 4.6	16 ± 3.1	0.005

Discussion

Conventional decontamination does not remove protein traces from reusable airway equipments adequately ^{4,6}, and this fact has led to fears of the potential spreading of prion-related diseases by this equipment. Observations indicate that tonsils which were removed

from the patients who developed variant Creutzfeldt-Jakob disease (vCJD) contained prion protein⁷ prompted the mandatory introduction of single-use equipment for tonsillectomy surgery in January 2001. When this directive increased, surgical morbidity was recorded, leading to the conclusion that the potential risk of transmitting vCJD was outweighed by the actual risk of the use of single-use (surgical) equipments. By a return to the use of reusable surgical equipment, the Department of Health directive was reversed in the December of 2001.

At the same time, the use of the single-use anesthetic equipments was also mandatory. Thereby it stopped the use of reinforced laryngeal masks and the necessitating routine uses of tracheal tubes and single-use laryngoscopes⁸. When the directive on surgical equipments was reversed, restrictions on the reuse of anesthetic equipment were initially lifted and then it was re-imposed in March of 2002. This subject is controversial and opposing views have been expressed in this regard^{9,10}. The role of single-use laryngoscopes in future anesthetic practice remains uncertain. Equipments such as laryngoscopes can presently be introduced into practice without the stringent testing of performance that new drugs have to undergo. It is possible that equipments with worse performances than the existing devices be marketed.

Many types of single-use blades are manufactured with different designs and materials.

The results of our study and similar studies show that tracheal intubation is more difficult with single-use blades. There have also been several reports of difficulties in viewing the glottis with single-use laryngoscopes^{3,11}. Since the disposable blades were not easily accepted by the anesthetists particularly for difficult intubations, the reusable blades should not be totally removed from practice¹². Twigg et al also have reported that the time to intubate with the standard laryngoscope was less in both easy and difficult intubations than the laryngoscope with disposable blades¹³. Insertion of single-use blades in the mouth as reported by Bazin et al was found to be easy in 94% of the patients. The visualization was good or excellent in 83% of the cases and the users experienced difficulties to intubate in only 16% of the patients¹⁴. These findings were similar to the results of our study.

Conclusions

In routine uses, the single-use laryngoscope blade appears to be an efficient device because it does not modify the ease of endotracheal intubation in most cases. Nonetheless, for difficult intubations it may be advisable to maintain conventional laryngoscopes in reserve¹⁴.

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