Caroline Setsuko Yamanaka[1], Aécio Flávio Teixeira de Góis[2], Paulo César Bastos Vieira[3], Jane Cristina Dias Alves[4], Luciana Matias de Oliveira[4], Leila Blanes[5], Eliton Paulo Leite Lourenço[6], Murillo Assunção[7], Flavia Ribeiro Machado[8]

Orotracheal intubation: physician's knowledge assessment and clinical practices in intensive care units

Intubação orotraqueal: avaliação do conhecimento médico e das práticas clínicas adotadas em unidades de terapia intensiva

1. Medical Graduation Student of Escola Paulista de Medicina da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
2. PhD, Physician of Disciplina de Emergências Clinicas da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
3. Physician of Disciplina de Pneumologia da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
4. Nurse of the Intensive Care Unit of Disciplina de Anestesiologia, Dor e Terapia Intensiva da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
5. Nurse of the Intensive Care Unit of Disciplina de Emergências Clínicas da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
6. Nurse of the Intensive Care Unit of Disciplina de Pneumologia da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
7. MSc, Physician of the Intensive Care Sector of Disciplina de Anestesiologia, Dor e Terapia Intensiva da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.
8. PhD, Adjunct Professor to Disciplina de Anestesiologia, Dor e Terapia Intensiva da Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

Received from the Universidade Federal de São Paulo – UNIFESP – São Paulo (SP), Brazil.

This article is part of the *Programa Institucional de Bolsas de Iniciação Científica* [Scientific Initiation Scholarship Program] (PIBIC) of the *Conselho Nacional de Desenvolvimento Científico e Tecnológico* [National Scientific and Technological Development Council] (CNPq).

Presented on the XXIX Brazilian Congress of Critical Care, in São Paulo, on November 2009.

Submitted on February 23, 2010
Accepted on April 14, 2010

Author for correspondence:
Flavia Ribeiro Machado
Disciplina de Anestesiologia, Dor e Terapia Intensiva.
Rua Napoleão de Barros, 715 – 5º andar
ZIP Code: 04024-900 - São Paulo (SP), Brazil.
Phone: +55 (11) 5576-4069
E-mail: fmachado.dcir@epm.br

ABSTRACT

Objectives: To assess the physician's knowledge on intubation techniques and to identify the common practices.

Methods: This was a prospective study, involving three different intensive care units within a University hospital: Anesthesiology (ANEST), Pulmonology (PULMO) and Emergency Department (ED). All physicians working in these units and consenting to participate in the study completed a questionnaire with their demographic data and questions on orotracheal intubation.

Results: 85 completed questionnaires were retrieved (90.42% of the physicians). ANEST had the higher mean age (p=0.001), being 43.5% of them intensivists. The use of hypnotic and opioid association was reported by 97.6%, and preoxygenation by 91.8%, but only 44.6% reported sub-occipital pad use, with no difference between the ICUs. On ANEST an increased neuromuscular blockade use was reported (p<0.000) as well as increased caution with full stomach (p=0.002). The rapid sequence knowledge was restricted (mean 2.20 ± 0.89), p=0.06 between the different units. The Sellick maneuver was known by 97.6%, but 72% used it inappropriately.

Conclusions: Physicians knowledge on orotracheal intubation in the intensive care unit is unsatisfactory, even among qualified professionals. It is necessary to check if the responses to the questionnaire and actual clinical practices agree.

Keywords: Orotracheal, intubation; Knowledge; Intensive care

INTRODUCTION

Orotracheal intubation (OTI) is considered one of the most important potential life savers procedures. Its main indication is for situations with impaired airways patency. As with any other procedure, OTI may have risks and complications,[1-5] preventable if performed with correct technique. Among the main complications, esophageal intubation may cause hypoxemia, hypercapnia, and death; selective intubation, may cause the non-ventilated lung atelectasis, or barotraumas; and trauma involving upper airways, cervical spine, teeth, heart arrhythmias and others. OTI is a routine procedure in intensive care units (ICUs), being evident the need for correct technique intubations. For this, it is important to know the intubation techniques, which should strictly comply with a protocol attending to all its steps.

In order to minimize risks, the physician should perform a patient's initial evaluation regarding consciousness level, pulmonary aspiration risk factors and difficult airway. It is important to highlight that all ICU pa-

tients, as a matter of principle, should be considered as in danger of aspiration, and thus undergo rapid sequence intubation.[6-9] In this, the procedure is made with more agility than classically, with an opioid administration together with an hypnotic, followed by a fast acting neuromuscular blocker (NMB), mandatory Sellick maneuver, and no assisted ventilation use.[10-12]

Several studies on medical OTI practices evaluated how intubations are conducted, showing lack of OTI techniques standardization, wide inter-individual variability on emergency[13], anesthesiology[14,15] and intensive care[1] practice settings. Regarding the intensive care intubation practice, some articles specifically evaluating intubation complications were also found.[1,16,17] In addition to this practical procedure evaluation, some authors also evaluated the physician's knowledge, using questionnaires.[18-20] Morris et al.[18] and Thwaites et al.[19] showed a considerable range of practices for rapid sequence intubation among anesthesiologists. The same was seen for anesthesiology residents.[20] Other articles showed the correct Sellick maneuver knowledge to be scarce.[21-23] In the reviewed literature, no articles were found on intensive care theoretical knowledge.

This study was proposed aiming to evaluate the physicians' knowledge on intubation techniques, and to identify the most common procedures used in ICUs.

METHODS

After approval by the Hospital São Paulo's Ethics Committee, a prospective study was conducted involving physicians who worked in the intensive care units of Anesthesiology [Disciplina de Anestesiologia, Dor e Terapia Intensiva] (ANEST); Pulmonology (PULMO) and Emergency Department (ED) of Hospital São Paulo from September to December 2008. These units have fixed clinical teams, in addition to several specialties residents rotating in monthly training periods. In this study, only the fixed physicians and intensive care, internal medicine and pulmonology residents in apprenticeship in ANEST, ED and PULMO, respectively, were included. Anesthesiology residents were excluded from ANEST analysis in order to prevent a selection bias, as these doctors have a different background on this subject.

The study was conducted by means of a questionnaire completion. Considering the need to maintain the subjects' confidentiality, and that the signature of an informed consent form would render the study conduction unfeasible, we opted to inform the subjects, in the questionnaire heading, that completing it would mean consenting to participate in the study.

The questionnaire, in addition to the subject's demographics and medical activity information, had questions to evaluate the physicians' routine during intubation and their knowledge on the subject. For the sake of validation, the questionnaire was completed by a difficult airways expert anesthesiologist. Later, five specialists certified by the Associação de Medicina Intensiva Brasileira [Brazilian Intensive Medicine Association] completed the validation, marking all correct answers within 30 minutes.

The physicians who agreed to participate completed the questionnaire during their work shift. After completion, the questionnaire was inserted in an envelope and sealed. In addition, it was verified with each ICU head the existence of a proper airways management protocol, including practices for difficult airway.

The results are presented descriptively, with percents for each alternative response. The erased responses were cancelled. Regarding the differences between rapid sequence and classical intubation, each correct response was attributed one point, and the total points was named grade.

Comparisons were conducted between the different units regarding the percentages and mean grade, as well as the physicians' characteristics. The categorical variables were analyzed with the Pearson's Chi-square test. The continuous variables, after submitted to the Shapiro-Wilk normality test, were expressed as mean plus/minus standard deviation, and compared using the t Student test. Regarding the categorical variables, when a significant difference was found, the bipartite Chi square test was conducted, to indicate the units which effectively differed from each other. The Epi Info™ 3.4.1 statistical package was used, and $p < 0.05$ values were considered statistically significant.

RESULTS

In the ANEST group, 46 out of 48 physicians were included (95.83%); from these, 12 were residents not linked to Anesthesiology (26.1%). In the ED group, 22 physicians were included (96.65% of the total doctors), being 15 residents (68.2%), and in the PULMO group 17 physicians (77.27% of the total) were included, being 16 residents (94.11%). Thus, 90.42%

of the physicians working in the ICUs were included.

The ANEST physicians are significantly older than those in other ICUs (mean age: 36.6±4.6, 29.2±6.3 and 29.6±5.0 for ANEST, PULMO and ED, respectively, p=0.001). Similarly, a significant difference was observed for the time since graduation (9.5±4.5, 4.7±6.6 and 4.6±5.5 for ANEST, PULMO and ED, respectively, p=0.003), reflecting the larger residents ratio in other ICUs (26.1%, 94.1% and 68.2% for ANEST, PULMO and ED, respectively, p<0.000). Additionally, 43.5% of the ANEST physicians were certified intensive care specialists (4.9% and 9.1% for PULMO and ED, respectively, p<0.000). They have more ICU weekly working hours (41.3% of the ANEST physicians work longer than 60 hours, while 11.8% of the PULMO physicians and 15.0% of the ED ones have this workload; p=0.002); which was different for emergency department practice (ANEST 34.8%, PULMO 81.3% and ED 86.4%, p<0.000). The data on the population characteristics and multiple comparison p values are shown on table 1.

Table 1 - Physicians demographics by intensive care unit

Variable	ANEST (N =46)	PULMO (N =17)	ED (N =22)	P value
Male gender	20 (43.5)	10 (58.8)	11 (50.0)	0.55
Age (years)	33.6±4.6	29.2±6.3	29.6±5.0	0.001
Time from graduation (years)	9.5±4.5	4.7±6.6	4.6±5.5	<0.0001
Present residents	12 (26.1)	16 (94.1)	15 (68.2)	<0.0001
Ongoing residency in				<0.0001
Intensive care	7 (63.3)	0	0	
Cardiology	4 (36.4)	0	1 (6.7)	
Pulmonology	0	16 (100)	0	
Internal medicine	0	0	14 (93.3)	
Specialty				<0.0001
Intensive care	31 (68.9)	1 (6.7)	2 (9.1)	
Cardiology	10 (22.2)	0	4 (18.2)	
Pulmonology	0	16 (94.1)	1 (4.5)	
Internal medicine	0	0	13 (59.1)	
Others	4 (8.8)	0	2 (9.1)	
ICU hours weekly				0.002
12	1 (2.2)	2 (11.8)	7 (35)	
12 to 24	6 (13.0)	7 (41.2)	3 (15)	
25 to 48	13 (28.3)	4 (23.5)	5 (25)	
49 to 60	7 (15.2)	2 (11.8)	2 (10)	
More than 60	19 (41.3)	2 (11.8)	3 (15)	
Certified intensivist*	20 (43.5)	1 (5.9)	2 (9.1)	0.001
ICU specialization	23 (51.1)	0	1 (4.5)	<0.0001
ED activity	16 (34.8)	13 (81.3)	19 (86.4)	<0.0001
Hospital profile**				<0.0001
Public	7 (17.9)	1 (5.9)	0	
Private	11 (28.2)	0	3 (13.6)	
Hospital São Paulo	13 (33.3)	16 (94.1)	16 (72.7)	
University, others	8 (20.5)	0	3 (13.6)	

*Associação de Medicina Intensiva Brasileira specialist certificate. **Profile of the hospital with more dedicated time. ICU – intensive care unit; ANEST – Anesthesiology ICU; PULMO– Pulmonology ICU; ED – emergency department ICU. Results expressed as number (%) or mean ± standard deviation. T-student and Chi-square. The values are in regard of the overall analysis, with no multiple comparison testing.

ANEST and ED have their own airway protocols, and 97.8% and 22.7%of their physicians, respectively, are aware of these. Among those aware of the protocol, it was considered easily assessable by 70.5% of the ANEST and 20% of the ED physicians. Additionally, in the ANEST group most of the professionals are aware of available devices for difficult airway in the unit (95.6%), different from the other units, which haven't these devices or whose doctors are unaware of their availability.

Some of the currently recommended OTI clinical practices were mentioned by most of the ICUs physicians, as the hypnotic and opioid association use (97.6%) and pre-oxygenation (91.8%). Midazolam was the preferred hypnotic (61.2%), however etomidate had its use more mentioned by ANEST physicians (40%, 5.9% and 27.3% for ANEST, PULMO and ED, respectively, p=0.01). The initial use of opioids followed by hypnotic and then NMB was the order mentioned by 75% of the ANEST physicians versus 35.3% for PULMO and 68.2% for ED. Non-use of other drugs such as lidocaine, beta-blocker, ,metoclopramide and ranitidine was mentioned by 73% of the professionals.

The sub-occipital pad was used for 44.6% of the OTIs, with no ICUs differences (p=0.1). Some difficult airway protocol practices, however, are more largely used by the ANEST physicians, such as considering all ICU patients as full stomach (34.8%, 11.8% and 9.5% for ANEST, PULMO and ED, respectively, p=0.002) and use of NMB for OTIs (65.2%, 17.6% and 27.3% for ANEST, PULMO and ED, respectively, p<0.000).

Although most of the physicians reported to know the differences between the rapid sequence and classical intubation (93.3%, 70.6% and 90.9% for ANEST, PULMO and ED, respectively, p=0.042), they weren't able to correctly indicate these differences (mean 2.28±0.92, 2.08±0.90 and 2.10±0.85 for ANEST, PULMO and ED, respectively, p=0.6). Non use of assisted ventilation before the first attempt in the rapid sequence was reported as a difference by only 20.3% of the physicians. Shortening the inter-drugs interval was marked as a difference by 51.3% of the doctors; 57.1% of them indicated a mandatory Sellick maneuver as being a difference between the rapid sequence and classical intubation. Fast acting NMB use was also marked by most of the physicians (83.8%) as a difference between the intubation modes, and this could explain why succinylcholine was the professionals' first choice (76.9%).

Almost 100% of the physicians are aware of the Sellick maneuver, however only 15.4% of them reported its timely use, and only 28.0% until the OTI is appropriately checked. Other data regarding the physicians' knowledge and OTI practices in the different ICUs, as well as the p values for multiple comparison analysis, can be found on tables 2 to 5.

Table 2 – Evaluation of the knowledge and clinical practice regarding orotracheal intubation by intensive care unit

Variable	ANEST (N=46)	PULMO (N=17)	ED (N=22)	P value
Pre-oxygenation	40 (87.0)	16 (94.1)	22 (100)	0.55
Full stomach presence	16 (34.8)	2 (11.8)	2 (9.5)	0.002(PNEUMO) <0.0001 (PS)
Most chosen check				0.67
Vocal cords seen	21 (47.7)	11 (68.8)	11 (50)	
Chest expansion	1 (2.3)	0	0	
Lung auscultation	20 (45.5)	5 (31.3)	9 (40.9)	
Capnograph	2 (4.5)	0	2 (9.1)	
Tube vapor	0	0	0	

Results expressed as number (%). Chi-square. When the overall analysis significance level was lower than 0.05, the p values express the comparison of the given units with the ANEST unit for the multiple comparison tests. ICU – intensive care unit; ANEST – Anesthesiology ICU; PULMO – Pulmonology ICU; ED – Emergency Department ICU

Table 3 – Use of drugs during the intubation process in the different intensive care units

Variable	ANEST (N =46)	PULMO (N =17)	ED (N 22)	P value
Opioid use	45 (97.8)	16 (94.1)	22 (100)	0.48
Hypnotic use	46 (100	17 (100)	22 (100)	0.54
Chosen hypnotic				0.01
Propophol	6 (13.32)	2 (11.1)	0	
Midazolam	1 (46.7)	15 (83.3)	16 (72.7)	
Etomidate	18 (40.0	1 (5.5)	6 (27.3)	
NMB use	30 (65.2)	3 (17.6)	6 (27.3)	0.001(PULMO) 0.003(ED)
NMB use, %				<0.0001
Less than 25%	1 (3.4)	1 (33.3)	2 (33.3)	
25 to 50%	6 (20.7)	1 (33.3)	1 (16.7)	
50 to 75%	3 (10.3)	1 (33.3)	1 (16.7)	
More than 75%	6 (20.7)	0	0	
All times	13 (44.8)	0	2 (33.3)	
More chosen NMB				0.002
Succinilcholine	23 (76.7)	3 (100)	4 (66.7)	
Rocuronium	5 (16.7)	0	0	
Atracurium	1 (3.3)	0	0	
Pancuronium	1 (3.3)	0	2 (33.3)	
Reason for the NMB choice				<0.0001
Duration	14 (37.8)	2 (28.6)	5 (35.7)	
Onset of action	15 (40.5)	1 (14.3)	6 (42.9)	
Side effects	11 (2.7)	1 (14.3)	2 (14.3)	
Anticipated difficulty	5 (13.5)	1 (14.3)	0	
Dilution practicality	0	1 (14.3)	0	
Availability	2 (5.4)	1 (14.3)	1 (7.1)	
Drugs order				0.18
Hypnotic/opioid/NMB	10 (22.7)	5 (29.4)	4 (18.2)	
Opioid/hypnotic/NMB	33 (75)	6 (35.3)	15 (68.2)	
Opioid+Hypnotic/NMB,AN	1 (2.3)	3 (17.6)	2 (9.1)	
Others	0	3 (17.6)	1 (4.5)	
Extra drugs use				0.001
Lidocaine	4 (9.8)	0	2 (9.5)	
Beta blocker	0	0	0	
Metoclopramide	5 (10.9)	0	1 (4.7)	
Ranitidine	4 (8.7)	0	0	

ANEST – Anesthesiology ICU; PULMO – Pulmonology ICU; ED – Emergency Department ICU; NMB – neuromuscular blocker; OTI – orotracheal intubation; AN – as needed; Results expressed as number (%). Chi-square. When the overall analysis significance level was below 0.05, the p values express the comparison of the given units with ANEST in the multiple comparison tests.

Table 4 – Availability of a protocol, knowledge and clinical practice regarding difficult airway in the intensive care units

Variable	ANEST (N =46)	PULMO (N =17)	ED (N =22)	P value
Protocol in the ICU	44 (97.8)	1 (5.9)	5 (22.7)	<0.0001
Awareness of the protocol	42 (95.5)	0	4 (80.0)	<0.000(PULMO)
				0.54 (ED)
Access to the protocol	31 (70.5)	1 (100)	1 (20.0)	0.65 (PULMO)
				0.02 (ED)
Devices for DAW in the ICU	43 (95.6)	1 (5.9)	2 (9.1)	<0.0001
Use of sub-occipital pad				<0.0001
Always	23 (51.1)	6 (35.3)	8 (38.1)	
For DAW patients only	16 (33.3)	6 (35.3)	3 (14.3)	
As needed only	6 (13.3	5 (29.4)	10 (47.6)	
Never, but is aware of the function	0	0	0	
Not aware of the function	0	0	0	
DAW course	34 (77.3)	2 (11.8)	2 (9.1)	<0.0001

ANEST – Anesthesiology ICU; PULMO – Pulmonology ICU; ED – Emergency Department ICU; DAW – difficult airway; ICU – intensive care unit; Results expressed as number (%). Chi-square. When the overall analysis significance level was below 0.05, the p values express the comparison of the given units with the ANEST unit in the multiple comparison test.

Table 5 – Knowledge of classical and rapid sequence intubation in intensive care units

Variable	ANEST (N =46)	PULMO (N =17)	ED (N =22)	P value
Knows rapid sequence	42 (93.3)	12 (70.6)	20 (90.9)	0.02 (PULMO)
				0.43 (ED)
OTIs differences				
Laryngeal compression	17 (40.5)	3 (25.0)	6 (30.0)	0.52
Fast acting NMB	32 (76.2)	12 (100)	18 (90.0)	0.09
Metoclopramide use	11 (26.2)	2 (16.7)	12 (60.0)	0.54
Mandatory Sellick	32 (76.2)	4 (33.3)	0	0.01 (PULMO)
				0.45 (ED)
Pre-oxygenation	22 (52.4)	10 (83.3)	13 (65.0)	0.13
Non use of assisted ventilation	11 (26.2)	2 (16.7)	2 (10.0)	0.315
Antiacid use	1 (16.7)	0	0	0.05
Intervals reduction	21 (50.0)	7 (58.3)	10 (50.0)	0.87
Wrong answers (n)				<0.0001
0	9 (21.4)	0	6 (30.0)	
1	16 (38.1)	9 (75.0)	6 (30.0)	
2	11 (26.2)	3 (25.0)	8 (40.0)	
3	5 (11.9)	0	0	
4	1 (2.4)	0	0	
Grade*	2.28±0.92	2.08±0.81	2.10±0.73	0.66
Uses Sellick	44 (100)	15 (93.8)	21 (95.5)	0.28
When uses				0.32
Awaken patient	1 (2.3)	0	0	
Drowsy patient	5 (11.6)	5 (35.7)	2 (9.5)	
After consciousness loss	36 (83.7)	9 (64.3)	19 (90.5)	
Opioid start	1 (2.3)	0	0	
When releases the maneuver				0.15
View the cords	1 (2.3)	1 (6.3)	2 (9.1)	
Tube in the trachea	17 (38.6)	9 (56.3)	15 (68.2)	
Insufflated balloon	11 (25.0)	2 (12.5)	1 (4.5)	
Checked OTI	14 (34.1)	4 (25.0)	4 (18.2)	

ANEST – Anesthesiology ICU; PULMO – Pulmonology ICU; ED – Emergency Department ICU; OTI – orotracheal intubation; NMB – neuromuscular blocker; NS – non significant. Results expressed as number (%), except * expressed as mean ± standard deviation. Chi-square and T-sudent. When the overall analysis significance level was below 0.05, the p values express the comparison of the given units with the ANEST unit in the multiple comparison test.

DISCUSSION

In this study we could identify disagreement between the physicians' reported intubation techniques and the literature recommended procedures. Some unsatisfactory results were identified regarding a number of basic intubation procedures, such as fasting, sub-occipital pad use, rapid sequence and the timely use of the Sellick maneuver. Additionally, the responses to questions regarding the neuromuscular blocker chosen and the drugs administration order were shown to be different from the current recommendations.[8,24-27] These findings were more relevant in units missing their own OTI protocols or where the physicians are unaware of the existing protocols.

The results may be considered unsatisfactory even in the unit that have the most experienced intensive care physicians. The PULMO and ED results, where 50.5% of the participants are residents or non board-ed-certified intensivists (41.2% of the total), could be attributable to the shorter professional experience and less qualification. However, the results in ANEST suggest that this matter is not considered priority in the intensivist formation, even in those who, theoretically, had specific airways training in some continued medical education method. These findings illustrate these education process limitations, as the retention of information was unappropriate. Comparing this study findings with the literature,[13-20] it can be noticed that this study was broader, analyzing a larger number of variables. Regarding initial OTI practices, pre-oxygenation was mentioned as usual practice by most of the physicians, as in the Morris et al.[18] and Thwaites et al.[19] studies. The use of a pad in all OTIs was overall low, however no discussions on this were found in the literature. To consider patients as having full stomach didn't reach a satisfactory rate either. In addition, the use of antiemetic, prokinetic or H2 antagonists drugs were reported only by 12.34%, different of the Thwaites et al.[19] findings, where 95% of the physicians reported using antiacids. This study, however, analyzed anesthesiology patients, where this practice relevance is well established. Despite this, even in anesthesiology, its frequency looks variable, as Morris et al.[18] documented this practice by only 4% of the respondents.

The associated use of opioid and hypnotic was reported by most of the physicians, with a preference for midazolam. In the Morris et al. study, 75% used opioid, however 51% avoided using Midazolam, being thiopental preferred by 88%, and propophol by 58%.[18] Thwaites et al. documented routine opioid use by 3%, thiopental by 96%, and etomidate by 21%.[19] These studies were developed in anesthesiology settings. Yet, in intensive therapy, Jaber et al. reported opioid use in 30%, etomidate in 50% and propophol in 14% of the OTIs.[1]

The use of NMB was relatively low, differently from other studies where most of the physicians reported its use.[16,17] In the Jaber et al. study, the use of NMB was documented in 62% of the OTIs, a rate very close to the ANEST group.[1] This may be related to the fact that this study documented OTIs performed in the ICU, and in the others only anesthesiologists were evaluated. On the other hand in the Schwartz et al.[16] study, the overall NMB use was 80%, and 22% in the Le Tacon et al.[17] study, again showing a variability of the OTI techniques used by intensivist physicians. In this study, succinylcholine was the first choice, with a higher frequency than in the Jaber et al.[1] (69%), Schwartz et al.[16] (57%), and Le Tacon et al.[17] (41%) studies. On the other hand, in the Morris et al. study this rate was 99%.[18]

The knowledge on rapid sequence intubation was unsatisfactory. However, in this context it is important to have in mind the current argument on this maneuver, not being clear if the rapid sequence should be used for all critical patients or just for specific potentially benefited groups.[6,25-26] Despite this, such a lack of knowledge could compromize its eventual benefit, as some studies have already shown high success rates with reduced complications in rapid sequence OTIs.[25,27-30]

Most of the physicians reported to use the Sellick maneuver, as in the two previous studies.[18,19] However, only a small portion of them timely perform it, differently from the observed in the Thwaites et al.[19] (78% by the induction time) and Morris et al.[18] (71% before conscious loss) studies. The actual relevance of this disputed efficacy maneuver is currently under discussion[20,31] as aspiration deaths were seen even though the maneuver use.[32,33] Schwartz and Cohen, however, argument that, of the patients who didn't aspirate during the intubation, 90% were underwent the Sellick maneuver.[34] In addition, studies in cadavers have shown the maneuver effectiveness[35] and Lawes EG et al.[36] have shown the reduced gastric insufflation during ventilation while on Sellick maneuver. No maneuver effectiveness was shown in prospective studies due to possible ethical issues involved. Thus, as previously said, the health care professionals training on correct

maneuver use appears to be appropriate, in order to prevent mistakes and complications.

This study have some strengths. Although being a single center study that can't be considered representative of the actual medical knowledge, the majority of three different ICUs physicians were evaluated. Additionally, this was a broad and validated questionnaire, used in a fashion that protected the participants' confidentiality. The questions should be answered in the presented sequence, not being allowed to go back to previous questions. This was particularly relevant for the question regarding knowledge on rapid sequence intubation.

On the other hand, there were limitations. A questionnaire is not necessarily a good way to evaluate knowledge, although it was long, having varied and validated questions. Additionally, due to the proximity of the ANEST with the Anesthesiology, perhaps the findings were better than what would be found in other ICUs with similar proportion of intensive medicine physicians. The fact of being an University hospital may also have overestimated the real national physicians' knowledge.

CONCLUSION

The physicians' knowledge on intensive therapy OTI is unsatisfactory, even among the most qualified professionals. It is necessary to evaluate if there is an agreement between the responses to the questionnaire and the actual clinical practice. It would be then possible to prevent iatrogenias and complications entailed by poor compliance to the good practices.

ACKNOWLEDGEMENTS

We would like to thank doctors Úrsula Guirro and Claudia Lutke for their support on preparation of the questionnaire used in this study.

RESUMO

Objetivos: Avaliar o conhecimento médico sobre as técnicas de intubação e identificar as práticas mais realizadas.

Métodos: Estudo prospectivo, envolvendo três diferentes unidades de terapia intensiva de um hospital universitário: da anestesiologia (ANEST), da pneumologia (PNEUMO) e do pronto socorro (PS). Todos os médicos que trabalham nessas unidades e que concordaram em participar do estudo, responderam um questionário contendo dados demográficos e questões sobre intubação orotraqueal.

Resultados: Foram obtidos 85 questionários (90,42% dos médicos). ANEST teve maior média de idade (p = 0,001), com 43,5% sendo intensivistas. Foi referido uso da associação hipnótico e opióide (97,6%) e pré oxigenação (91,8%), mas apenas 44,6% referiram utilização de coxim suboccipital, sem diferença entre as UTIs. Na ANEST, referiu-se maior uso de bloqueador neuromuscular (p < 0,000) e maior cuidado com estômago cheio (p = 0,002). O conhecimento sobre sequência rápida foi restrito (nota média – 2,20 ± 0,89, com p = 0,6 entre as unidades de terapia intensiva. A manobra de Sellick era conhecida por (97,6%), mas 72% usaram-na inapropriadamente.

Conclusões: O conhecimento médico sobre intubação orotraqueal em terapia intensiva não é satisfatório, mesmo entre profissionais qualificados para tal procedimento. É necessário avaliar se há concordância entre as respostas dos questionários e as práticas clínicas efetivamente adotadas.

Descritores: Intubação orotraqueal; Conhecimento; Terapia intensiva

REFERENCES

1. Jaber S, Amraoui J, Lefrant JY, Arich C, Cohendy R, Landreau L, et al. Clinical practice and risk factors for immediate complications of endotracheal intubation in the intensive care unit: a prospective, multiple-center study. Crit Care Med. 2006;34(9):2355-61.
2. Kabrhel C, Thomsen TW, Setnik GS, Walls RM. Videos in clinical medicine. Orotracheal intubation. N Engl J Med. 2007;356(17):e15. Erratum in: N Engl J Med. 2007;356(21):2228.
3. Faria MD. Tubagens traqueais e brônquicas. In: Pohl FF, Petroianu A, editoress.Tubos, sondas e drenos. Rio de Janeiro: Guanabara Koogan; 2000.
4. Falcão LFR, Leal PHR. Intubação endotraqueal na UTI. In: Falcão LFR, Guimarães HP, Amaral JLG, editores. Medicina Intensiva para graduação. São Paulo: Atheneu; 2006.
5. Martins RHG, Dias NH, Braz JRC, Castilho EC. Complicações das vias aéreas relacionadas à intubação endotraqueal. Rev Bras Otorrinolaringol. 2004;70(5):671-7.
6. Reynolds SF, Heffner J. Airway management of the critically ill patient: rapid-sequence intubation. Chest. 2005;127(4):1397-412.
7. Bamber J. Airway crises. Curr Anaesth Crit Care. 2003;14(1):2-8.
8. Stocker R, Biro P. Airway management and artificial ventilation in intensive care. Curr Opin Anaesthesiol. 2005;18(1):35-45
9. Stept WJ, Safar P. Rapid induction/intubation for prevention of gastric content aspiration. Anesth Analg. 1970;49(4):633-6.

10. Ortenzi AV. Medicação pré anestésica. In: Cangiani LM, Posso IP, Potério GMB, Nogueira CS, editores. Tratado de anestesiologia SAESP. 6a. ed. São Paulo: Atheneu; 2006.
11. Helfman SM, Gold MI, DeLisser EA, Herrington CA. Which drug prevents tachycardia and hypertension associated with tracheal intubation: lidocaine, fentanyl, or esmolol? Anesth Analg. 1991;72(4):482-6.
12. Kindler CH, Schumacher PG, Schneider MC, Urwyler A. Effects of intravenous lidocaine and/or esmolol on hemodynamic responses to laryngoscopy and intubation: a double-blind, controlled clinical trial. J Clin Anesth. 1996;8(6):491-6.
13. Jérémie N, Seltzer S, Lenfant F, Ricard-Hibon A, Facon A, Cabrita B, et al. Rapid sequence induction: a survey of practices in three French prehospital mobile emergency units. Eur J Emerg Med. 2006;13(3):148-55.
14. Koerber JP, Roberts GE, Whitaker R, Thorpe CM. Variation in rapid sequence induction techniques: current practice in Wales. Anaesthesia. 2009;64(1):54-9.
15. Politis GD, Tobin JR, Morell RC, James RL, Cantwell MF. Tracheal intubation of healthy pediatric patients without muscle relaxant: a survey of technique utilization and perceptions of safety. Anesth Analg. 1999;88(4):737-41.
16. Schwartz DE, Matthay MA, Cohen NH. Death and other complications of emergency airway management in critically ill adults. A prospective investigation of 297 tracheal intubations. Anesthesiology. 1995;82(2):367-76.
17. Le Tacon S, Wolter P, Rusterholtz T, et al: [Complications of difficult tracheal intubations in a critical care unit]. Ann Fr Anesth Reanim. 2000;19(10):719-24. French.
18. Morris J, Cook TM. Rapid sequence induction: a national survey of practice. Anaesthesia. 2001;56(11):1090-7.
19. Thwaites AJ, Rice CP, Smith I. Rapid sequence induction: a questionnaire survey of its routine conduct and continued management during a failed intubation. Anaesthesia. 1999;54(4):376-81.
20. Guirro UBP, Martins CR, Munechika M. Indução em sequência rápida: avaliação da técnica dos anestesiologistas e residentes no Hospital São Paulo. Rev Anestesiol Estado Rio Grande do Norte. 2007;1:94.
21. Kron SS. Questionable effectiveness of cricoid pressure in preventing aspiration. Anesthesiology. 1995;83(2):431-2.
22. Brimacombe JR, Berry AM. Cricoid pressure. Can J Anaesth. 1997;44(4):414-25.
23. Robinson JS, Thompson JM. Fatal aspiration (Mendelson's) syndrome despite antacids and cricoid pressure. Lancet. 1979;2(8136): 228-30.
24. American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Practice guidelines for management of the difficult airway: an updated report by the American Society of Anesthesiologists Task Force on Management of the Difficult Airway. Anesthesiology. 2003;98(5):1269-77. Erratum in: Anesthesiology. 2004;101(2):565.
25. Kovacs G, Law JA, Ross J, Tallon J, MacQuarrie K, Petrie D, et al. Acute airway management in the emergency department by non-anesthesiologists. Can J Anaesth. 2004;51(2):174-80.
26. Walz JM, Zayaruzny M, Heard SO. Airway management in critical illness. Chest. 2007;131(2):608-20. Review.
27. Jones JH, Weaver CS, Rusyniak DE, Brizendine EJ, McGrath RB. Impact of emergency medicine faculty and an airway protocol on airway management. Acad Emerg Med. 2002;9(12):1452-6.
28. Tayal VS, Riggs RW, Marx JA, Tomaszewski CA, Schneider RE. Rapid-sequence intubation at an emergency medicine residency: success rate and adverse events during a two-year period. Acad Emerg Med. 1999;6(1):31-7.
29. Rose WD, Anderson LD, Edmond SA. Analysis of intubations. Before and after establishment of a rapid sequence intubation protocol for air medical use. Air Med J. 1994;13(11-12):475-8.
30. Sagarin MJ, Barton ED, Chng YM, Walls RM; National Emergency Airway Registry Investigators. Airway management by US and Canadian emergency medicine residents: a multicenter analysis of more than 6,000 endotracheal intubation attempts. Ann Emerg Med. 2005;46(4):328-36.
31. Meek T, Gittins N, Duggan JE. Cricoid pressure: knowledge and performance amongst anaesthetic assistants. Anaesthesia. 1999;54(1):59-62.
32. Howells TH, Chamney AR, Wraight WJ, Simons RS. The application of cricoid pressure. An assessment and a survey of its practice. Anaesthesia. 1983;38(5):457-60.
33. Moro ET, Goulart A. Compressão da cartilagem cricóide: aspectos atuais. Rev Bras Anestesiol. 2008;58(6):646-50.
34. Schwartz DE, Cohen NH. Questionable effectiveness of cricoid pressure in preventing aspiration. Anesthesiology. 1995;83(2):432.
35. Salem MR, Joseph NJ, Heyman HJ, Belani B, Paulissian R, Ferrara TP. Cricoid compression is effective in obliterating the esophageal lumen in the presence of a nasogastric tube. Anesthesiology. 1985;63(4):443-6.
36. Lawes EG, Campbell I, Mercer D. Inflation pressure, gastric insufflation and rapid sequence induction. Br J Anaesth. 1987;59(3):315-8.