

# A national Internet survey on rapid sequence intubation patterns from Turkey

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Received: 28 May 2008 / Accepted: 16 September 2008 / Published online: 1 November 2008  
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## Abstract

**Aim** To determine which specialty was performing rapid sequence intubation (RSI) in the emergency departments and to determine drug preferences of emergency physicians during RSI in Turkey.

**Method** All emergency departments were contacted via e-mail, and the chiefs of the departments were requested to answer a survey consisting of six questions. Hospitals within the specified regions were selected with the only inclusion criteria being that the hospital had an emergency medicine department. We determined that there were 32 university and 9 state hospital emergency medicine residency programs.

**Results** Thirty-five emergency departments responded. In 31 (73%) departments emergency medicine physicians, in 4 (10%) departments anesthetists, and in 7 (17%) departments physicians of either specialty were routinely performing RSI. The most commonly preferred drugs were fentanyl for premedication, vecuronium for defasciculation, etomidate for induction, and succinylcholine for neuromuscular blocking.

**Conclusion** In the majority of the emergency departments in Turkey, emergency medicine physicians perform the RSI; the anesthetists perform it in only a few departments.

**Keywords** Rapid sequence intubation · Emergency department

## Introduction

Rapid sequence induction of anesthesia is a specific technique originally used by anesthetists, described formally in 1970 by Stept and Safar [1], who showed it to reduce the risk of aspiration of gastric contents. With the advent of critical care, this procedure was increasingly used for the rapid control and protection of the airway, and for ventilation [2]. Safe, effective airway management in critically ill or injured patients is the cornerstone of resuscitation. Rapid sequence intubation (RSI) represents an important element in this process. It is defined as the virtual simultaneous administration of a potent sedative agent and neuromuscular blocking drug to facilitate tracheal intubation. By providing unparalleled access to the airway, and superior protection against adverse effects such as aspiration, RSI is the fastest and safest way to secure a definitive airway [3].

RSI is a protocol predicated on the successful administration of several medications in a specific sequence. The medications fall into one of several categories of agents: pretreatment, induction, and paralytic. The purpose of this survey was to find out which specialty is performing RSIs in the emergency departments and to determine drug preferences of emergency physicians during RSI in Turkey.

## Methods

University and state hospitals with ongoing emergency medicine residency programs were included in the study. Hospitals within the specified regions were selected with the only inclusion criteria being that the hospital had an

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emergency medicine department. We determined 32 university and 9 state hospital emergency medicine residency programs. The chief of the program or department was contacted via e-mail and requested to answer a survey consisting of six questions. The first question was to determine the specialties that perform the RSI in the emergency department. The following questions were about the drug preferences during premedication, defasciculation, induction, and neuromuscular blocking. The last question was about the preferred agent for maintaining sedation.

## Results

From the total of 41 emergency medicine residency programs, 35 emergency departments (28 university hospitals and 7 state hospitals) were successfully contacted during the period from January-February 2008. Table 1 and Fig. 1 show the answers to the questions.

## Discussion

RSI is a technique that both emergency physicians and anesthetists should master. Recent literature has indicated that rapid sequence intubation (RSI) with neuromuscular blocking agents has become the most common method emergency physicians use to achieve tracheal intubation [4]. This survey demonstrates that RSI is mostly being performed by emergency physicians in Turkey. This survey is to be the first to determine the specialties that perform RSI in the emergency department and drug preferences during RSI in Turkey.

According to the responses, frequently preferred premedications were fentanyl, the defasciculating agent vecuronium, the induction agent etomidate, and the neuromuscular

blocking agent (NMBA) was succinylcholine. Still, there is no consensus on the ideal induction agent for emergency RSI. A number of pharmacologically distinct medications are presently used for sedation, dissociation, hypnosis, or induction. Likewise, the muscle paralysis achieved by the NMBA is undoubtedly responsible for most of the improvement in ease of intubation using RSI techniques [5]. The ideal (induction and NMBA) agent would smoothly and quickly render the patient unconscious, unresponsive, and amnesic in one arm/heart/brain circulation time. Such an agent would also provide analgesia, maintain stable cerebral perfusion pressure and cardiovascular hemodynamics, be immediately reversible, and have few, if any, adverse side effects [6], in other words, have rapid onset, brief duration, and no side effects. Unfortunately, such an agent does not exist.

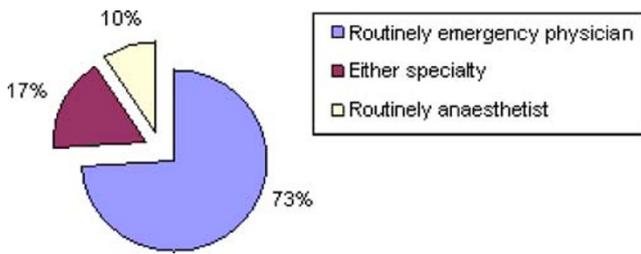
Pre-oxygenation is almost never used (2.6%) in premedication. This may be because of misunderstanding of the responders or the fault of the authors of this article that happened during construction of the survey. In some questions the responders were allowed to answer more than one option, but in some questions they were not. This may have resulted in confusion during answering the survey.

The concerns with using the nondepolarizing agents for intubation are their slow onset and long duration of action [7]. From a pharmacodynamic standpoint, succinylcholine's extremely rapid onset of action and its short duration of action make it the ideal NMBA for RSI. Unfortunately, succinylcholine can cause such adverse effects as fasciculation, increased intracranial pressure, and increased intraocular pressure. While many of these side effects are of little clinical significance, succinylcholine also can have some potentially life-threatening effects [4]. Despite these side effects, succinylcholine was the most preferred NMBA. In our survey, de-fasciculation is frequently performed with succinylcholine that provokes fasciculation.

**Table 1** Frequently preferred drugs during rapid sequence intubation

	n	%		n	%
<i>Premedication</i>			<i>Defasciculation</i>		
Fentanyl	22	56.4	Vecuronium	15	48.4
Lidocaine	7	17.9	Succinylcholine	7	22.6
Atropine	6	15.4	Midazolam	6	19.3
Midazolam	2	5.1	Rocuronium	3	9.7
Oxygen	1	2.6	<i>Induction</i>		
Haloperidol	1	2.6	Etomidate	14	41.2
<i>Maintenance of sedation</i>			Propofol	9	26.5
Midazolam	16	45.8	Fentanyl	6	17.6
Propofol	12	34.3	Midazolam	5	14.7
Etomidate	4	11.4	<i>NMB</i>		
Diazepam	2	5.7	Succinylcholine	22	71.0
Norcuron	1	2.8	Vecuronium	5	16.1
			Rocuronium	3	9.7
			Atracurium	1	3.2

**Abbreviations:** *n*, number of answers in total; NMB, neuromuscular blocking agent



**Fig. 1** Rapid sequence intubation performing specialty

After the patient has been successfully intubated, consideration of long-term sedation and muscle relaxation must be made. Patients frequently can be managed with sedation alone, but neuromuscular blockade also is required at times [7]. Propofol, ketamine, benzodiazepines, and opioids all are appropriate choices for sedation, with any of the nondepolarizing agents useful for paralysis. Midazolam and propofol were the commonly preferred agents for maintenance of sedation.

RSI is not without risks. The drugs used have the potential to turn an urgent airway problem into a life-threatening situation [3]. This survey demonstrated that RSI is currently being performed by emergency physicians. Emergency medicine in Turkey is in its infancy and needs to develop official guidelines in this field.

*Limitations of the survey* The responders were not requested to define the reason for their drug preferences during RSI. The residency training programs are not supposed to use only one protocol for RSI. Different trainers could perform RSI with different drugs; however, the survey requested only one response from each ED.

**Conclusion**

In the majority of the emergency departments in Turkey, emergency medicine physicians perform the RSI, with anesthetists performing it only in a few departments. The frequently preferred premedication was fentanyl, the defasciculating agent vecuronium, the induction agent etomidate, and NMBA was succinylcholine.

**Conflicts of interest** None.

**Appendix: Rapid sequence intubation (RSI) in the emergency department**

**Multiregional analysis of current activity**

To be completed by the chief of the emergency medicine department (or the responsible of the education program)

Name of the institution .....

1. Which specialty is performing rapid sequence intubation (RSI) in your emergency department?
  - a. Emergency medicine
  - b. Anesthesia
  - c. Other (please specify).  
.....
2. In unexceptional circumstances, which one of the following medications do you prefer for *premedication* during RSI?
  - a. Lidocaine
  - b. Atropine
  - c. Fentanyl
  - d. Other (please specify).  
.....
3. In unexceptional circumstances, which one of the following medications do you prefer for *defasciculation* during RSI?
  - a. Vecuronium
  - b. Rocuronium
  - c. Atracurium
  - d. Haloperidol
  - e. Midazolam
  - f. Other (please specify).  
.....
4. In unexceptional circumstances, which one of the following medications do you prefer for *induction* during RSI?
  - a. Thiopental
  - b. Ketamine
  - c. Etomidate
  - d. Propofol
  - e. Fentanyl
  - f. Other (please specify).  
.....
5. Which one of the following drugs do you prefer for *paralysis* during RSI?
  - a. Succinylcholine
  - b. Vecuronium
  - c. Rocuronium
  - d. Atracurium
  - e. Other (please specify).  
.....
6. For the maintenance of sedation, which agent(s) do you prefer? (Please specify)  
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**Thanks for your assistance.**

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