The Professional Medical Journal
www.theprofesional.com
DOI: 10.17957/TPMJ/15.3034

ORIGINAL PROF-3034

ENDOTRACHEAL INTUBATION PROCEDURES;
PERFORMED AT ACCIDENT AND EMERGENCY DEPARTMENT AT CIVIL HOSPITAL KARACHI PAKISTAN.

Dr. Shua Nasir[1], Dr. Lal Shehbaz[2], Dr. Hamid Raza[3], Dr. Saqib Basar[4]

1. MD, Resident Emergency Medicine, Department of Emergency Medicine, Ziauddin University of Hospital, Karachi.
2. MBBS, Resident Emergency Medicine, Department of Emergency Medicine, Ziauddin University of Hospital, Karachi.
3. Assistant Professor Anesthesiology & ICU, Liaquat University of Medical and Health Sciences, Jamshoro
4. MBBS, House officer, Civil Hospital Karachi.

Correspondence Address:
Dr. Saqib Basar
House Officer
Civil Hospital Karachi.
saqibbasar1@gmail.com
ahmedaliakuh@gmail.com

Article received on:
27/07/2015
Accepted for publication:
23/09/2015
Received after proof reading:
13/11/2015

ABSTRACT… Objective: The objective of the study is to study the procedure of endotracheal intubation; its methods between Rapid sequence intubation and crash intubation its success rates and the associated short term complications at the accident and emergency department of a government run hospital in Karachi, Pakistan. **Study Design:** Case series. **Setting:** Accident and Emergency Department of Civil Hospital Karachi. **Period:** 2010 to 2012. **Methods:** The sample size taken is of 260 patients, all of whom must be above the age of 14 years, and undergo the procedure of emergency endotracheal intubation. Rapid sequence intubation is analyzed against crash intubation using descriptive type of statistical analysis. The significance level was $p<0.05$. **Results:** From the 260 Endotracheal intubations performed, 45 (17.30%) had to be discarded on account of incomplete data. The remaining study population was 215 patients (123 males, 92 females) Rapid sequence intubation was the commonest type (n=138, 64.18%). Head and neck injury, pulmonary edema was the common complication. Crash intubation was the second type (n= 77, 35.8%) Primary attempt success was found to be 97% (n=134) in rapid sequence intubation and 80% (n = 62) in crash Endotracheal intubations. A total of 13 complications (6.04 %) were observed. **Conclusion:** In light of the results obtained our study shows a satisfactory success rate on using either mentioned types of intubation procedures that is either RSI or Crash Intubation.

Key words: Accident and Emergency department, endotracheal Intubations, Complications of ETT, rapid sequence intubation, crash intubation, tertiary care hospital Karachi.

Article Citation: Nasir S, Shehbaz L, Raza H, Basar S. Endotracheal intubation procedures; performed at accident and emergency department at civil hospital Karachi Pakistan. Professional Med J 2015;22(11):1509-1513. **DOI:** 10.17957/TPMJ/15.3034

INTRODUCTION

In the accidents and emergency department, the acutely ill patients who come to the hospital in a state of shortness of breath or hypoxia, in such patients, control of the airway and adequate ventilation are a physician's prime objective, and achievement of this task is through endotracheal intubation. Endotracheal intubation or ETI for short provides positive pressure ventilation and specific concentration of inspired oxygen.[1] But this is a very technical procedure to perform and highly skilled personnel are required to carry it out in an emergency setting as opposed to an elective case performed on the operation table.[2,3] The reasons for this discrepancy being specific patient characteristics, type of intubation and the presence of a specialist. The chances of the procedure not going accordingly are from 14-28% and it shows an increase with the number of attempts at intubation and the method of intubation utilized.[4]

There are two different methods used for intubations the rapid sequence intubation and crash intubation. Rapid sequence intubation or RSI is the more widespread and relatively safer procedure to use in emergency situations.[5] Due to the high impact on morbidity and mortality of patients it is recommended that all physicians dealing with emergency cases be competent in performing this procedure, and possess the merit to handle all acute airway emergencies.[6] As the field of emergency management advanced and achieved wide spread recognition, airway management has achieved a mandatory skill level among emergency care physicians.[7] There is a

dearth of data in developing countries for intubations and its complications. In a third world country like Pakistan the data is lacking, the objective of our study is to gather data on methods, success rate and complications of intubation procedures as performed in a tertiary care hospital in Karachi, Pakistan.

PATIENTS AND METHODS

The case series had a span of two years from May 2010 to May 2012. All the patients who presented to the accident and emergency department of Civil Hospital Karachi were included. The emergency physician included the casualty medical officer and residents of respective subspecialties. An anesthetist was available at all times to perform any intubations when called for**.** Patients older than 15 years of age were included who need intubation either due to trauma or ant medical issue. The exclusion criteria for the study was all the patients under 15 years of age, all patients who had an endotracheal tube already placed in, from some other ward or hospital. Expired patients and patients requiring ventilator support were also excluded from the study. The use of neuromuscular blocking agents and sedatives was only done during rapid sequence intubation, and not during crash intubation. A medical graduate used a data collection tool to acquire the following data, Patient demographics: (Name, age, gender, occupation), reason for intubation, precipitating and relieving factors, diagnosis, method utilized, total number of attempts done for a successful intubation, medications used, short term complications. Since the mode of data collection was chart review there is a room for error and bias. To rectify this problem, patients having incomplete data were excluded from the study. Thus only 215 patients were selected for statistical analysis. Data was analyzed with SPSS 19. The level of significance was set at $p<0.05$. The ethical review board considered the study to be in ethics exempted category. Descriptive statistics noted the details of patients, procedure and complications. For continuous variables and other such data, standard deviation and averages were computed. Chi-square test was conducted to compare variables concerning the types of procedures. t-test was used to compare age.

RESULTS

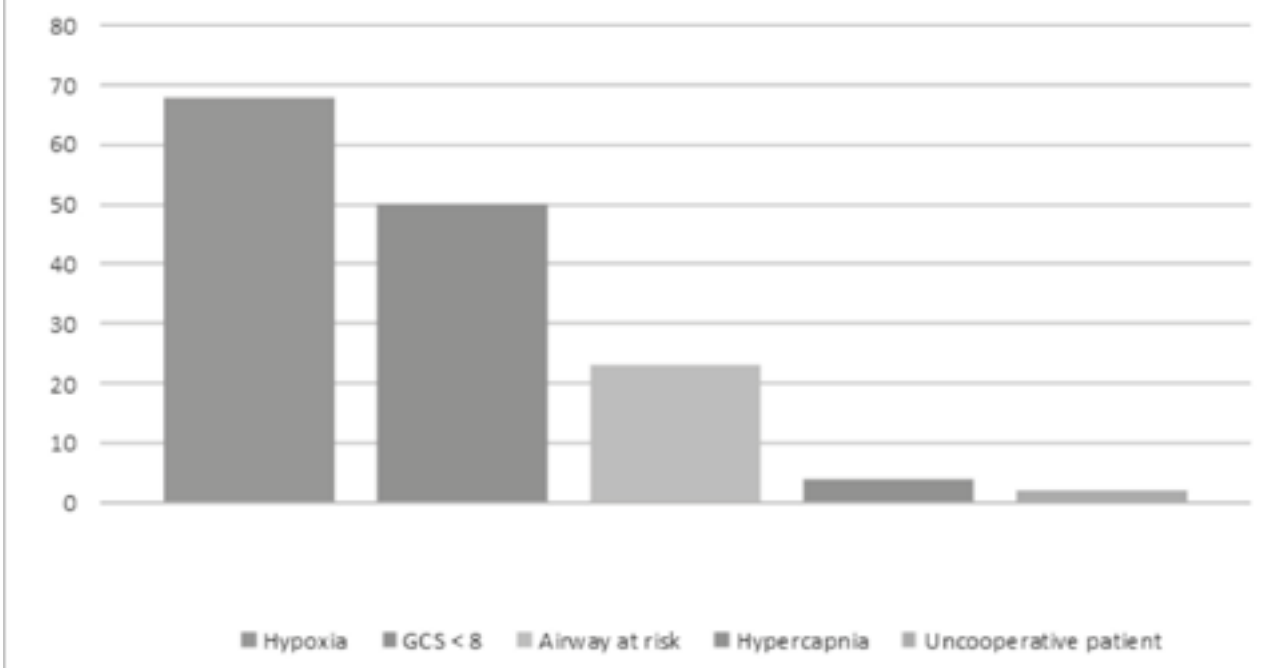
215 patients underwent the intubation procedure and met the inclusion criteria during the period of the study. The age range of the study sample was between 15 +/- 55 years. There were 123 (57.2%) males and 92 (42.79) females in the study. The commonest reason for undergoing the procedure was an existing medical condition in 172 (80%) of patients. The next in line was trauma patients 33 (15%). The diagnosis of patients requiring the procedure to be done was pulmonary edema 58 (27%) head injury 20 (9%). Hypoxia or low blood oxygen saturation being the top indication for intervention in 146 (68%) of cases, and when analyzed using the multiple response analysis (n = 148, 69%) (Figure), Emergency physician made the decision to perform the intubation in 148 (69%) cases**.** The procedure was performed by a skilled and trained team of anesthesiologists that includes Resident year 3 and 4, in 183 (85%) of cases while the Emergency response team performed it in 28 (13%) of patients. The success rate of primary attempt at intubation was 202 (94%). Rapid sequence intubations was (n=138, 64.18%) and crash intubations was (n= 77, 35.8%).

Other statistics are as follows, total complication that occurred on short term basis noted in the data were 11 (15%), 6 in Rapid sequence intubation and 5 in crash intubations. The complication rate in first attempt were 3%, for second attempt 22% and 50% for third attempt .The complications were cardiac arrest (n=2,1%) oxygen desaturation (n=3,2%), and low blood pressure (hypotension) (n=2,1%) in RSI, while oropharyngeal trauma (n=3,5%), cardiac arrest (n=2,4%) and regurgitation (n=2,4%) were noted during crash intubation. From time of arrival at the accident and emergency department to performing the procedure was 70 +/- 100 minutes in Rapid sequence intubation and 10 +/- 200 minutes in crash intubation. The time passed from decision to intubate to actual intubation was 25 +/- 95 minutes in Rapid sequence intubation and 10 +/- 20 minutes in crash intubations.

VARIABLES	Rapid Sequence Intubation	Crash intubation	p-value
Gender			
Male	90 (65%)	33 (52%)	0.06
Female	48 (35%)	44 (48%)	
Reason for intubation			
Medical	109 (79%)	69 (89%)	0.20
Surgical	7 (5%)	2 (4%)	
Trauma	22 (16%)	6 (7%)	
Doctor who made the decision			
Anesthetist	8 (6%)	-	0.01
Emergency care physician	90 (65%)	67 (87%)	
Medicine	37 (27%)	8 (11%)	
Surgery	3 (2%)	2 (2%)	
Doctor who performed the intubation			
Anesthetist	127 (92%)	42 (55%)	0.0001
Emergency care physician	9 (6.5%)	33 (43%)	
Medicine	2 (2%)	2 (2%)	
Number of Attempts made for intubation			
Primary	135 (98%)	65 (85%)	0.001
Secondary	3 (2%)	8 (11%)	
Tertiary	0	4 (4%)	

Table. Rapid sequence intubation (n=138) versus crash intubation (n=77)

Indications for intervention



DISCUSSION

According to our study, at the accident and emergency department of civil hospital Karachi, rapid sequence intubation is the method of choice for endotracheal intubation. It is safer and has less than 5% complications, the indications for its use are pulmonary edema and head injury in our setup. Even though it's a safe procedure there are still some risks involved.[12] Even though in our setup RSI is the more common procedure used, other studies have reported a lack of usage of RSI[11] In Britain, a recent study reports 0.12% incidence of accident and emergency department, rapid sequence intubations of which 20% were performed by emergency care physicians. Senior anesthetic trainees from third year of training and above from anesthesiology department undertook 80% of accident and emergency department, rapid sequence intubations.[14] A recent study which involved one thousand and sixty eight cases of accident and emergency department intubations over a period of 5 years reported 51% of the intubations to be orotracheal without any use of medications, followed by 28% rapid sequence intubations.[13] Another recent study shows that there are no differences in failure rates between emergency department staff performing the intubations versus anesthetists performing the same procedure (2.73% versus 0%, $p<0.55$).[12] Others studies also report very little or no difference at all in the success rates between the two afore mentioned groups.[10] In the more advanced nations indications for intubations comprise of trauma, and a low Glasgow Coma Scale (GCS) score. In England 25% of intubated patients were trauma patients.[14] In our data pulmonary edema and related medical conditions were the reason for intubation (80%) and trauma (15%), in a regional study pneumonia and stroke were the indications in non-traumatic patients for intubation.[11] In another study cardiopulmonary arrest, congestive heart failure and head injury (38%, 21% and 8%) were the reasons for intubation.[13] In a regional study peri-intubation complications were explained by hypotension, multiple attempts at intubation and oesophageal intubation.[13] In our data hypotension, cardiac arrest and oxygen desaturation were the common complications. In a study conducted in Thailand soft tissue injury, hypotension and oesophageal intubations were major complications.[11] Rapid sequence intubation causes less soft tissue injury. Our data cannot be generalized to mass population because it originated from a single setup and used retrospective approach. Also the exclusion of patients due to death, or shifting to other wards and hospitals accounted for some loss of data.

CONCLUSION

According to afore mentioned study endotracheal intubation has a good success rate regardless of the method of intubation utilized. Rapid sequence intubation was the method of choice, and which is also the recommend procedure according to the latest recommendations. Indication for intubation was low blood oxygen saturation (hypoxia) pulmonary edema being the common diagnosis.

REFERENCES

1. Habermann TM, Ghosh AK, Rhodes DJ, Sood A, Murali N, Edson R, et al. **Mayo Clinical Internal Medicine Review 2006-2007.** 7 ed. New York: Mayo Clinic Scientific Press, 2006; pp 152.

2. Mort TC. **Complications of emergency tracheal intubation: hemodynamic alterations - part I.** J Intensive Care Med 2007; 22: 157-65.

3. Mort TC. **Complications of emergency tracheal intubation: immediate airway-related consequences: part II.** J Intensive Care Med 2007; 22: 208-15.

4. Gudzenko V, Bittner EA, Schmidt UH. **Emergency airway management.** Respir Care 2010; 55: 1026-35. Dufour DG, Larose DL, Clement SC. Rapid sequence intubation in the emergency department. J Emerg Med 1995; 13: 705-10.

5. 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: 174-80.

6. Sakles JC, Laurin EG, Rantapaa AA, Panacek EA. **Airway management in the emergency department: a one-year study of 610 tracheal intubations.** Ann Emerg Med 1998; 31: 325-32.

7. Nayyar P, Lisbon A. **Non-operating room emergency airway management and endotracheal intubation**

practices: a survey of anesthesiology program directors. Anesth Analg 1997; 85: 62-8.

8. Ma OJ, Bentley B, 2nd, Debehnke DJ. **Airway management practices in emergency medicine residencies.** Am J Emerg Med 1995; 13: 501-4.

9. Dibble CP, McHague C. **Rapid sequence intubations by emergency doctors: we can but are we?** Emerg Med J 2007; 24: 480-1.

10. Wongyingsinn M, Songarj P, Assawinvinijkul T. **A prospective observational study of tracheal intubation in an emergency department in a 2300-bed hospital of a developing country in a one-year period.** Emerg Med J 2009; 26: 604-8.

11. Fullerton JN, Roberts KJ, Wyse M. **Should non-anaesthetists perform pre-hospital rapid sequence induction?** an observational study. Emerg Med J 2010; 28: 428-31.

12. Wong E, Fong YT, Ho KK. **Emergency airway management--experience of a tertiary hospital in South-East Asia.** Resuscitation 2004; 61: 349-55.

13. Benger J, Hopkinson S. **Rapid sequence induction of anaesthesia in UK emergency departments: a national census.** Emerg Med J 2011; 28: 217-20.

AUTHORSHIP AND CONTRIBUTION DECLARATION

Sr. #	Author-s Full Name	Contribution to the paper	Author=s Signature
1	Dr. Shua Nasir	Concept, Writeup, analysis data interpretation	
2	Dr. Lal Shehbaz	Writeup, data collection analysis	
3	Dr. Hamid Raza	Topic selection, writeup, data interprataion	
4	Dr. Saqib Basr	Data collection, drafting	