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Research Article

Practice of Extubation in the Emergency Department: A Cross-Sectional Observational Study

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ABSTRACT

Background: The practice of extubation is unpopular among emergency departments (EDs) worldwide, owing to numerous factors including lack of professional training required for the procedure. In addition, data on the safety of this procedure remains unavailable.

Methods: This study reviewed extubation cases in the ED of the King Fahd Hospital, Madina, with the objective of determining the safety of this procedure. Clinico-demographic details of 50 patients, who underwent extubation in the ED, over a period of 4 years, were collected manually from the hospital records and analyzed.

Results: The median patient age was 30 years, and 78% patients were male. Underlying causes included blunt trauma (72%) blunt trauma and medical experience (26%). Of the 50 patients, 20 were intubated before arrival to the ED; 72% were intubated because of decreased levels of consciousness, 20% because of hypoxia, and 8% because of combative behavior. Of the 50 patients that underwent extubation, only 2 (4%) had to undergo unplanned reintubation, while 6 (12%) were scheduled for orthopedic and neurosurgical procedures. The ICU admission rate post extubation was 16% as 8 patients' required ICU admission, whereas the remaining 42 patients (84%) were transferred to the wards.

Conclusion: This study indicates that extubation in the ED is safe if the clinical condition necessitating airway control has resolved during hospital stay. Further studies are required to assess the impact of extubation on duration of hospital stay and to establish whether the practice of extubation allows for more a judicial use of hospital resources.

Keywords: Emergency department; ICU; Extubation; Patients

ABBREVIATIONS

ED: Emergency Department; KFH: King Fahd Hospital; RT: Respiratory Therapist; DNR: Do Not Resuscitate; MRP: Most Responsible Physician; COPD: Chronic Obstructive Pulmonary Disease.

INTRODUCTION

The Emergency Department (ED) at the King Fahd Hospital (KFH), Madina is a major trauma center in the region and can experience congestion due to heavy inflow of patients. A possible solution to alleviate this situation is the timely disposal of intubated patients. EDs worldwide are not keen on extubating patients for various reasons, including a lack of resources and relevant training. Further, sufficient data on the safety of this procedure is not available. The ED at KFH has been performing extubations for a few years. The aim of this study was to investigate the safety of the extubation procedures.

Intubation in the ED requires admission to a high-acuity bed and intensive monitoring by nurses and physicians for the entire duration of the patient's stay [1]. This results in depletion of hospital resources and manpower and may also cause congestion of the ED. A feasible alternative would be to extubate the patients once the clinical condition necessitating airway control has resolved, as this would enable the patient to be transferred to the ward or, if highly stable, even discharged home. This will allow the hospital to save valuable resources and will also prevent congestion of ED. This study aimed to establish the safety of the practice of extubation through a retrospective analysis of extubated cases in our ED over a period of 4 years [2].

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MATERIALS AND METHODS

Study design and setting

This was a retrospective observational study of extubation cases among adult and pediatric patients in KFH Madinah ED. The study was conducted in the ED of KFH Madinah; patients were treated and extubation was performed in the critical area of the department. The ethical committee at the KFH approved the study. Since this was a retrospective analysis, the study did not require informed consent from the patients. Patient selection the critical area records were manually searched for patients who were extubated over the past 4 years. A standard proforma was used to record relevant information concerning various aspects of the procedure, including post-extubation sequelae. This information was collected by two qualified ED physicians with no conflict of interest [3-5].

Intervention

The ED policies at KFH, Madina advocate for extubation procedures and the ED shift supervisor plays a vital role in the process along with the Respiratory Therapist (RT). Extubation is performed only on resolution of the clinical condition that required intubation [6].

Further, the patient's intubation history is required to be uneventful and the patient is required to have a minimum GCS above 12/15. In order to be eligible for an extubation, the patient's stats should be as follows: Saturation >95% on FIO2 ≤ 40% PEEP ≤ 5 cm H2O, respiratory rate 10-30/min, SBP >100 mmHg and HR <130. The exclusion criteria for extubation is as follows: 1) Elderly fragile patients with multiple comorbidities; 2) Patients who had difficult intubation; 3) Patients with maxillofacial injuries with soft tissue swelling or ongoing blood oozing inside the oropharynx; 4) Patients who already had secured ICU bed and ready for shifting; 5) Palliative care or DNR patients who were already booked to be shifted to the general ward; and 6) Confused or highly agitated patients who were likely to have restraining issues after extubation [7,8].

At the point when patients are surveyed for conceivable intubation, we routinely evaluate three spaces: inability to oxygenate and ventilate inability to keep an aviation route, and expected clinical course. To assess patients for extubation, these three spaces ought to be assessed and viewed as satisfactory: Patients should have the option to oxygenate and ventilate and keep a patent aviation route, and their expected clinical course should be predictable with extubation. The superseding idea is that the pathophysiologic express that commanded intubation has been tended to and settled. Albeit numerous patients might fall into this classification, logical up-and-comers in the ED would incorporate inebriated or glut patients in whom the inebriation has settled and minor head injury patients who are improving clinically (probable with a negative head CT check and huge injury precluded). Extubation may likewise be considered for pneumonic edema patients who are altogether moved along. There are likewise few patients who are intubated and on additional request are found to have declined forceful life support or to be resuscitated. These patients are clear contender for ED extuba-tion, and as a rule, extubation ought to proceed despite the continuous illness process.

As per the ED Extubation Protocol, the decision to carry out an extubation procedure is made by the ED supervisor or MRP team. The patient is prepared for the procedure. Sedatives and other anesthetic drugs are discontinued. A nebulizer is filled with normal saline and attached to a mask. The patient is made to sit up to at least 45° and is allowed to regain full consciousness [9]. ET tube suction with bronchial suction catheter and oropharynx suction with yankauer suction is carried out. The ET tube cuff is deflated and the patient is asked to cough, pull the tube during the cough, and then remove it. The oropharynx is suctioned again. The patient is encouraged to keep coughing up any secretions. The nebulizer mask is placed on the patient at 4–6 LPM oxygen if there is no chronic obstructive pulmonary disease (COPD) [10].

Outcome measures

The primary outcome was the need for unplanned reintubation post extubation. Planned reintubation was defined as elective intubation for a surgical procedure in the operating room.

Data analysis

Data were entered and analyzed using Microsoft Excel Windows 2013.

RESULTS

We analyzed 50 patients who had undergone extubation in the ED, over the past 4 years. Table 1 summarizes the clinico-demographic characteristics of the study participants. The median age of the participants was 30 years, and 78% of the patients were male. Regarding injury, 72% were injured by blunt trauma due to a road traffic accident, fall, and assault; 26% had a medical cause; and 2% of the injuries were due to other reasons. 20 patients were intubated before arrival at the ED whereas 30 patients were intubated post-arrival, in the ED (Table 2). Table 3 shows the reasons for intubation: 72% due to decreased consciousness, 20% due to hypoxia, and 8% due to combative behaviour. After extubation, only 2 (4%) patients had unplanned reintubation, and 6 (12%) patients were scheduled for orthopedic and neurosurgical procedures (Table 4). Table 5 shows the disposition; out of the 50 patients only 8 (16%) were admitted to ICU while the rest (84%) were transferred to the ward [11,12].

Table 1: Summarizes the clinic-demographic characteristics.

Characteristics	n=50	%
Age, median (Years)		30
Male %	39	78%
Injury type		
Blunt trauma %	36	72%
Road traffic accident %	30	83%
Assault %	3	8%
Fall %	3	8%
Penetrating trauma %	1	2%
Stab wound %	1	100%
Gunshot wound %	0	
Medical %	13	26%

Table 2: Intubated before arrival and post-arrival.

Place of intubation	#
Intubation before arrival	20
Intubation in ED	30

Table 3: The reasons for intubation.

Reasons for intubation	%
Conscious level	72%
Hypoxia	20%
Combative behavior	8%
Other	0

Table 4: Scheduled for orthopaedic and neurosurgical procedures.

Reasons for re-intubation	#	%
Unplanned reintubation	2	4%
Conscious level	1	50%
Hypoxia	1	50%
Planned reintubation	6	12%
Orthopedic operation	5	83.33%
Neurosurgical	1	16.66%

Table 5: Disposition of transferred to the ward.

Disposition	#	%
Admission	50	100%
Ward	42	84%
ICU	8	16%
Discharged	0	0

DISCUSSION

Our study involved retrospective analysis of extubation procedures performed on adult and pediatric patients who were intubated in our ED as well as those who arrived intubated to our ED from other hospitals. These included blunt trauma and other medical cases. All cases were supervised by our ED senior along with the RT [13]. Patients were selected according to the extubation policy in our department. The primary outcome was the need for unplanned reintubation post extubation.

CONCLUSION

This retrospective prognostic study indicates that ED extubation may be safe if the clinical condition necessitating airway control has resolved during the ED stay. Prospective controlled trials are needed to confirm these findings and establish whether ED extubation saves resources and limits the length of stay. At many centers, intubated patients require an intensive care unit bed, and ED extubation may allow admission to a lower acuity bed. At this stage, we do not recommend that centers inexperienced with ED extubation discharge these patients from the ED. In-hospital admission allow the patient to be observed for any post-extubation airway complications.

REFERENCES

1. Epstein SK. Extubation. Respir Care. 2002; 47(4):483-492.
2. Ely EW, Bennett PA, Bowton DL, Murphy SM, Florance AM, Haponik EF. Large scale implementation of a respiratory therapist–driven protocol for ventilator weaning. Am J Respir Crit Care Med. 1999; 159(2):439-446.
3. Weingart SD, Menaker J, Truong H, Bochicchio K, Scalea TM. Trauma patients can be safely extubated in the emergency department. J Emerg Med. 2011; 40(2):235-239.
4. Gray SH, Ross JA, Green RS. How to safely extubate a patient in the emergency department: A user's guide to critical care. Can J Emerg Med. 2013; 15(5):303-306.
5. Nwakanma CC, Wright BJ. Extubation in the emergency department and resuscitative unit setting. Emerg Med Clin North Am. 2019; 37(3):557-568.
6. Schneider SM, Gallery ME, Schafermeyer R, Zwemer FL. Emergency department crowding: A point in time. Ann Emerg Med. 2003; 42(2):167-172.
7. Thille AW, Richard JC, Brochard L. The decision to extubate in the intensive care unit. Am J Respir Crit Care Med. 2013; 187(12):1294-1302.
8. Thille AW, Harrois A, Schortgen F, Buisson CB, Brochard L. Outcomes of extubation failure in medical intensive care unit patients. Crit Care Med. 2011; 39(12):2612-2618.
9. Epstein SK, Ciubotaru RL, Wong JB. Effect of failed extubation on the outcome of mechanical ventilation. Chest. 1997; 112(1):186-192.
10. Chidi OO, Perman SM, Ginde AA. Characteristics of short-stay critical care admissions from emergency departments in Maryland. Acad Emerg Med. 2017; 24(10):1204-1211.
11. Herring AA, Ginde AA, Fahimi J, Alter HJ, Maselli JH, Espinola JA, et al. Increasing critical care admissions from U.S. Emergency departments. Crit Care Med. 2013; 41(5):1197-1204.
12. Kollef MH. Ventilator-associated complications, including infection-related complications: The way forward. Crit Care Clin. 2013; 29(1):33-50.
13. Mutlu GM, Mutlu EA, Factor P. GI complications in patients receiving mechanical ventilation. Chest. 2001; 119(4):1222-1241.