A RETROSPECTIVE OBSERVATIONAL STUDY TO ASSESS THE SAFETY AND FEASIBILITY OF PERCUTANEOUS DILATATIONAL TRACHEOSTOMY PERFORMED BY TRAINEES.

Abstract

The present study assess the safety and feasibility of percutaneous dilatational tracheostomy done by anaesthesiology trainees during critical care rotation, in terms of duration and complications developed during the procedure when compared to intensivists led procedures. This is a Retrospective observational study conducted on all patients on whom the procedure was done between January 2020 to June 2020. We had identified a significant difference in duration of performing the procedure between trainees and intensivists with a p value pf 0.001. From this study it is concluded that percutaneous dilatational tracheostomy performed by trainees is safe and feasibile, however further well defined studies should be conducted to confirm the results.

Keywords: anaesthesiology, percutaneous dilatational tracheostomy, Bleeding

INTRODUCTION

Percutaneous dilatational tracheostomy performed by an intensivist in critically ill patients is currently popular. Many studies support the safety and feasibility of this procedure[1]. However, there is limited data on the safety and feasibility of PDT performed by trainees. Therefore, this study is aimed at studying the safety and feasibility of PDTs done by trainees who were final year anaesthesiology trainees and compared it to those done by intensivists.

AIM:

To assess the safety and feasibility of percutaneous dilatational tracheostomy done by anaesthesiology trainees during critical care rotation, in terms of duration and complications developed during the procedure when compared to intensivists led procedures.

MATERIALS AND METHODS:

Institutional ethical committee permission was obtained.

This is a Retrospective observational study conducted on all patients on whom the procedure was done between January 2020 to June 2020

Over the study period, all patients who underwent PDT in ICU were prospectively registered. The following information was collected on each registered patient: Name, age, sex, diagnosis,

days on endotracheal tube, reason for tracheostomy, duration of the procedure and complications developed during the procedure.

The procedure time was defined as time from incision to insertion of tracheostomy tube.

Bleeding was classified as minor and major. Minor bleeding is defined as one from the incision site requiring frequent dressing and major bleeding as one that requires blood transfusion or surgical assistance.

False passage, cuff perforation and accidental extubation were all procedure related complications.

Hypoxemia was referred to an episode of pulse oximetry reading less than 90% during procedure.

Pneumothorax, pneumomediastinum, subcutaneous emphysema were confirmed when the chest Xray taken after 6hours showed evidence of relevant pathology.

PROCEDURE:

In this study, all PDTs were performed in the same manner. As described by Ciaglia et al[2], all patients were kept in supine position with hyperextension of the neck. Local anaesthesia was administered with 2% lignocaine and sedation and analgesia was used as needed. All patients were mechanically ventilated with 100%oxygen during the procedure. A 1-1.5cm vertical incision was made at the inferior edge of cricoid cartilage. The pretracheal soft tissue was bluntly dissected using a mosquito clamp and trachea is then punctured with a 14G needle and guidewire inserted. A guide sheath is then placed to prevent wire bending and trachea was serially dilated using appropriate sized dilators and tracheostomy tube was then passed over a dilator into the trachea. In all these cases Cooks percutaneous tracheostomy set was used.

In this study two intensivists have been performing the procedure since 1998 in our hospital. The trainees who performed the procedures were first required to assist in two or more procedures and then perform two or more procedures under their supervision before undertaking the procedures by themselves.

STATISTICS:

Based on the study, ”Safety and feasibility of Percutaneous Dilatational Tracheostomy performed by Intensive Care Trainees” by Daesang Lee et al[3].

SAMPLE SIZE:

A power analysis indicated that a sample size group1&2(35 +35 = 70) was sufficient to detect a significant statistical difference with $\alpha = 0.05$ and power $1-\beta = 0.8$. (Using a software- epiInfo). We therefore chose 100 patients for both group.

Table 1: Sample size calculation

Proportion 1	68
Proportion 2	32
Confidence level	95
Power	80
Ratio of sample sizes (n2/n1)	1
Tails	2

Table 2: Sample size required

	Sample size
Sample size 1 (n1):	35
Sample size 2 (n2):	35
Total sample size (both groups):	70

ANALYSIS:

The data are presented as medians for continuous variables and as numbers and percentages for categorical variables. Data were compared using Mann-Whitney U-test for continuos variables and Chi square test for categorical variables. A p value of <0.05 was considered significant. The data were analysed using PASW Statistics18(SPSS inc).

RESULT:

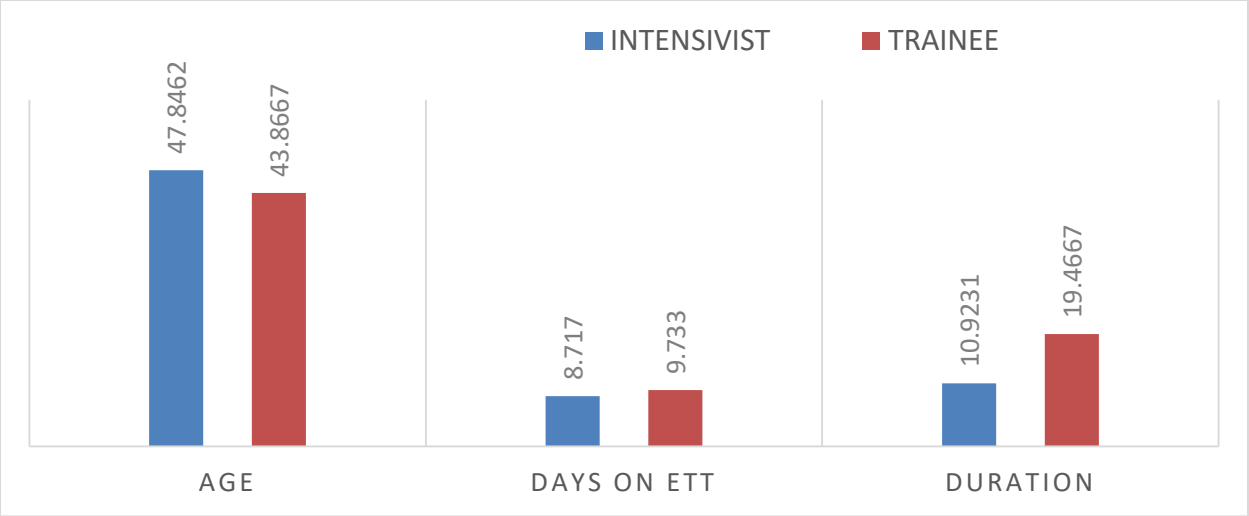
In the study period ,99 patients underwent percutaneous dilatational tracheostomy in our ICU;60(60.1%) by Trainees and 39(39.4%) by Intensivists. There were no statistically significant

differences in clinical characteristics including demographics (Age, sex), and days on endotracheal tube. The mean duration of the procedure was 19.47minutes in Trainee led procedures whereas it was 10.92 minutes in intensivist led procedures. The p value is 0.001 which is statistically significant. Increased duration of the procedure can cause repeated airway obstruction by dilators and cause hypoxemia. The majority of the complication which developed during the procedure was bleeding which was only minor (50% in each group) and it is statistically insignificant.

Table 3: Data statistics

	PERFORMER	N	Mean	Std. Deviation	Sig
AGE	INTENSIVIST	39	47.8462	16.19542	P=0.220
	TRAINEE	60	43.8667	15.29758	
DAYS ON ETT	INTENSIVIST	39	8.7179	5.13988	P=0.352
	TRAINEE	60	9.7333	5.36109	
DURATION	INTENSIVIST	39	10.9231	5.89551	P=0.001
	TRAINEE	60	19.4667	7.88577	

Fig 1:Bar graph showing Age and duration frequency



DISCUSSION:

The purpose of this study was to evaluate safety and feasibility of PDT performed by trainees by comparing clinical outcomes and complications between trainee-led PDT and intensivist-led PDT. PDT had been compared to conventional surgical technique in many previous studies and proved to be better, quicker and safer[4,5,6]. There were no significant results on comparing the demographic data between the two groups in our study. However, we had identified a significant difference in duration of performing the procedure between trainees and intensivists with a p value pf 0.001. In previous studies [3,7] the procedure time by trainees and intensivists were similar and were comparable. This could be due to the fact that the study included trainees who were subspecializing in intensive care and they have more years of experience and practice compared to trainees specializing in anesthesia who were taken in our study. There were no significant procedure related complications in both the groups. Most frequent complication identified in both groups was minor bleeding and its was comparable between them.These were fairly similar with the results of previous studies[8,9,10].

CONCLUSION:

From this study it is concluded that percutaneous dilatational tracheostomy performed by trainees is safe and feasibile, however further well defined studies should be conducted to confirm the results.

LIMITATIONS*:*

The study is retrospective in nature and has a small sample size.

It is conducted in tertiary care hospital with multidisciplinary team approach.

Only early complications were analysed and late complications were not taken into account.

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