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EARLY VS LATE, A COMPARISON TRIAL FOR BETTER OUTCOME OF TRACHEOSTOMIZED PATIENTS IN THE ICU OF A TERTIARY CARE HOSPITAL; SYSTEMIC ANALYSIS AND META-ANALYSIS

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ABSTRACT

Objective: The aim of this study is to share our experience of early tracheostomy vs late tracheostomy in patients, who required prolonged ventilation in the ICU of a tertiary care center.

Methods: This study was done on ventilatory patients in a ICU of tertiary care hospital, who underwent elective tracheostomy either early (<7) days or late (>7) days, for prolonged ventilations, over a span of 2 years, from January 2019 to December 2020, at Adesh medical college & hospital, Shahabad, kurukshetra.

Results: In this study, we observe patients with early tracheostomy in comparison to late one, showed little more complications in terms of bleeding but had overall better outcome regarding length of stay, mortality and better outcome.

Conclusion: Early tracheostomy is a little better modality compared to late tracheostomy, for patients requiring prolonged ventilation in ICU, in term of weaning, stay and outcome as per our study observation.

KEYWORDS : Early vs Late tracheostomy, prolonged tracheal intubation, Complications

INTRODUCTION

In the modern world, mechanical ventilation by endotracheal intubation and tracheostomy are very common methods in the ICU[1]. However, in case of need of prolonged mechanical ventilation in a critical ill patient, tracheostomy has several major advantages over endotracheal intubation , like reduced use of sedation, reduced trauma to the oropharynx and larynx, reduced laryngeal irritation, reduced work of breathing and improved clearance of pulmonary secretion, better patient tolerance[2,3]. But optimal timing of tracheostomy is always a debatable topic [4,5] Recent studies favor the use of early tracheostomy over late tracheostomy in terms of improved clinical outcome of a mechanically ventilated patient.[6]

The purpose of our study is to assess the benefits of early vs. late tracheostomy in terms of patient outcome,weaning from ventilator, less uses of medicine, better airway care, less hospital stays and cost benefit analysis, when compared with other published studies.

METHODS:

This study was conducted by department of Anesthesia with help Microbiologist and surgeons of the Adesh medical college, Shabad,Ambala, all the medical and surgical records of all patients, who were admitted in the ICU and underwent tracheostomy because of need of prolonged mechanical ventilation, were reviewed, for a period of 2years, since January 2019 to December 2020 and divided into two groups based on the day of tracheostomy.

In this study, over a span of 2years, all patients admitted to the ICU, who had been ventilated through endotracheal intubation and failed to be extubated so needed elective tracheostomy either early or late were included in this study. Day of tracheostomy was dependent on many factors like need of tracheostomy as per patient sick health status, decision of primary treating consultant, consent from relatives. Patients, who were on mechanical ventilation, who needed emergency tracheostomy, were excluded from thisstudy.

This study was divided into two groups: patients underwent early tracheostomy (<7 days) had been studied were included in group 1 and patients underwent late tracheostomy (>7 days) had been studied, were included in group 2 over the period of two years.

Tracheostomy was performed using standard surgical techniques in the main operation theater. Patients were ventilated for respectable period, with endotracheal intubation and all measures were taken into consideration to wean off from the mechanical ventilation as per norms and standard procedure, patients who were failed to be extubated and still needed mechanical ventilation underwent tracheostomy as per need for further mechanical ventilation and divided to both groups on basis of time of tracheostomy.

All the medical and surgical records were analyzed for age, sex, underlying disease, reason for prolonged ventilations, criteria to wean off from mechanical ventilation, time of tracheostomy, any complication occurred during and after tracheostomy, tracheostomy tube and samples sent for cultures to microbiology department to detect sepsis, ventilator associated pneumonia, microorganism growth and sensitive antibiotic pattern. and other factors like mortality rate and length of stay in the ICU, outcome , factors All patients were duly followed till their ICU stay and discharge.

RESULTS:

In this study, in the duration of 2 years or 24months, a total of 84 patients, 25 were in group 1 and 59 in group 2, were underwent an elective surgical tracheostomy were included in this study. Out of these 84 cases, there were 60 males and 24 females, and their age ranged from 20 yrs to 90 yr with mean age of 50 years.

There were different patients with different diagnosis, reason for their tracheal intubation and consequently their admission to ICU are summarized in Table 1. Early tracheostomy (within 1 week (4-7 days) of an ICU admission) was done in 44 (52.38%) patients while 40 (47.62%) patients had the late tracheostomy done in the more than 7 days, of tracheal intubation. The number of early vs late tracheostomy and the complications related to it are shown in Table2. All other parameters like average weaning period from ventilator, length of stay in the ICU for these patients and the overall mortality rate in early vs late tracheostomy in the respective period were shown in Table 3.

Table 1 Causes Of Prolonged Mechanical Ventilation In ICU

Causes	Percentage % in Group 1	Percentage % in Group 2
Trauma	42%	40%
Cerebro-vascular-accident	30%	34%
Pulmonary diseases	12%	10%
Chronic Liver diseases	7%	6%
Shock with Sepsis	4%	5%
Metabolic disorders	3%	3%
Others	2%	2%

Table No 2: Comlications Of Tracheostomy

Complications	Early Tracheostomy (n-44)	Late Tracheostomy (n-40)
Bleeding	6 (13.6%)	4 (10%)
Air trapped (Pneumothorax/ pneumo - mediastenum/subcutaneous emphysema)	4 (9%)	4((10%)
Blockage/ Reinsert	2 (4.5%)	5 (12.5%)
Pneumonia	2 (4.5%)	2(5%)
Others	2 (4.5%)	1(2.5%)

Table3: Various Parameters For Comparison

Parameters	Early tracheostomy	Late tracheostomy
Wean from Ventilator	4 days(mean)	7 days(mean)
Length of stay	6 days(mean)	10 days(mean)
Mortality	7%	12%

DISCUSSION

In this study, over the period of 2years, we had done study, in two different groups, divided into two groups of 12months each. All the eligible patients, who underwent elective tracheostomy either early (<7 days) and late (>7 days) were included and studied. All patients had undergone standard open surgical elective tracheostomy in the OT by an expert ENT surgeon, taking all precautions into consideration. All emergency tracheostomy, due to any reason, were excluding from the study.

In this study, we had compared parameters like causes of the prolonged ventilation, complication during and after the tracheostomy, weaning from the ventilator, length of stay in the ICU, mortality data etc, for both the early and late tracheostomy in the respective time period. We tried to compare the data in early vs late group and also with the already published data and studies to come to a conclusion that number of patients'tracheostomies were significantly higher in early group (44) as compared to late group(40) which could be due to the fact that even those patients were tracheostomies which we could have been weaned off without the need for surgical intervention.

In our study, we found that trauma was the top most cause of ICU admission, which is probably due to the location of our institute. Second most common cause was Cerbro-vascular accident due to any reason , needed ICU care, followed by the Pulmonary diseases was the third most commonly reported cause among ICU patients, occurring predominantly in individuals requiring mechanical ventilation, followed by, Chronic Liver diseases , mainly alcohol associate cirrhotic patients and Viral hepatitis were very common in our area, who needed constant ICU care and respiratory resuscitation many other disorder like CKD and other metabolic disorders being the reason of ICU admission and needed prolonged ventilation so tracheostomies ,similar to other studies Plummer et al (1989),Bowen et al (2001), Moller et al (2005). All causative factors had almost similar percentage of occurrence in patients needing tracheostomy in both the groups over the period of 2 years.

As talked about the complications, we found in our study, during and post tracheostomy period, the common complications as found in other studies like bleeding, air trapping, blockage and reinsertion of tracheostomy tube and ventilator-associated pneumonia, which were higher in late tracheostomy as compared to early tracheostomy and close and comparable to the some already published studies such as Whited et al (1984), Qureshi et al(2000), George,et al (1995) & Dunham et al (1984).

However, in our study we found that early vs late tracheostomy ratio, in terms of weaning fron ventilator(4:7), stayin ICU till discharge (3:5) and mortality rate (7:12) were better in early group as compared to late, and also supported by some studies which prefer early tracheostomy than latetracheostomy such as Maziak et al (1998), Hsu et al (2005), Griffiths et al (2005), Bickenbach et al (2011).

CONCLUSIONS

In conclusion, our results shows that may be early tracheostomy had little higher complications rate in few parameters than compared to late tracheostomy buthad better overall rate of weaning from ventilator, early ICU discharge and low mortality rate.

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Conflict Of Interest: None declared.

REFERENCES

1. Esteban A, Anzueto A, Alia I, Gordo F, Apezteguía C, Pálizas F, et al. How is mechanical ventilation employed in the intensive care unit? An international utilization review. Am J Respir Crit Care Med.2000;161:1450–8. [PubMed]
2. Rodriguez JL, Steinberg SM, Luchett FA, Gibbons KJ, Taheri PA, Flint Early tracheostomy for primaryairway management in the surgical critical care setting. Surgery. 1990;108:655–9.[PubMed]
3. Bouderka MA, Fakhir B, Bouggad A, Hmamouchi B, Hamoudi D, Harti A. Early tracheostomy versusprolonged endotracheal intubation in severe head injury. J Trauma. 2004;57:251–4.[PubMed]
4. Rumbak MJ, Newton M, TruncaleT, Schwartz SW, Adams JW, Hazard PB. A prospective randomized study comparing early percutaneous dilatational tracheostomy to prolonged trans laryngeal intubation (delayed tracheostomy) in critically ill medical patients. Crit Care Med. 2004;32:1689–94.[PubMed]
5. Kollef MH. The prevention of ventilator-associated pneumonia. N Engl J Med. 1999;340:627–34.[PubMed]
6. Kollef MH, Ahrens TS, Shannon W. Clinical predictors and outcomes for patients, requiring tracheostomy in the intensive care unit. Crit Care Med. 1999;27:1714–20.[PubMed]
7. Kluger Y, Paul DB, Luke J, Cox P, Colella JJ, Townsend RN, et al. Early tracheostomy in trauma patients. EurJ Emerg Med. 1996;3:95–101.[PubMed]
8. Durbin CG. Indications for and timing of tracheostomy. Respir Care. 2005;50:843–7.[PubMed]
9. Payor JP, Rielly PM, Shapiro MB. Surgical airway management in the intensive care unit. Rrit Care Clin.2000;16:473–8.
10. Elo' G, Penzes I. Role of percutaneous tracheostomy in intensive care: A review. Orv Hetil.2002;143:875–9. [PubMed]
11. Plummer AL, Gracy DR. Consensus conference on artificial airways in patients receiving mechanical ventilation. Chest. 1989;96:178–80. [PubMed]
12. American Thoracic Society. Hospital-acquired pneumonia in adults: Diagnosis, assessment of severity, initial antimicrobial therapy, and preventive stratigies. Am J Respir Crit Care Med. 1996;153:1711–25.[PubMed]
13. Bowen CP, Whitney LR, Truwit JD, Durbin CG, Moore MM. Comparison of safety and cost of percutaneous versus surgical tracheostomy. Am Surg. 2001;67:54–60.[PubMed]
14. Möller MG, Slikeu JD, Bonelli P, Davis AT, Hoogeboom JE, Bonnell BW. Early tracheostomy versuslate tracheostomy in the surgical intensive care unit. Am J Surg2005;189:293–6.[PubMed]
15. Whited RE. A prospective study of translaryngeal s. equelae in long term intubation. Laryngoscope.1984;94:67–77. [PubMed]
16. Qureshi AL, Suarez JI, Parekh PD, Bhardwaj A. Prediction and timing of tracheostomy in patientswith infratentorial lesions requiring mechanical ventilator support. Crit Care Med.2000;28:1383–7.[PubMed]
17. 17 George DL. Epidemiology of nococomial pneumonia in ICU patients. Clin Chest Med.1995;16:29 44. [PubMed]
18. Dunham C, LaMonica C. Prolonged tracheal intubation in the trauma patients. J Trauma. 1984;24:120–4. [PubMed]
19. Maziak D, Meade M, Todd T. The timing of tracheostomy: A systematic review. Chest. 1998;114:605–9. [PubMed]
20. Hsu CL, Chen KY, Chang CH, Jerng JS, Yu CJ, Yang PC. Timing of tracheostomy as a determinant ofweaning in critically ill patient: A retrospective study. Crit Care. 2005;9:46–52. [PMC freearticle][PubMed].