

Comparison of prolonged intubation and tracheostomy in pediatric intensive care unit among patients suffering from GB syndrome

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ABSTRACT

Background: Tracheostomy is often carried out in seriously sick patients for the ventilation. However, the importance of tracheostomy in ICU (intensive care unit) patients in terms of weaning from mechanical ventilation and outcomes remain controversial when compared with prolonged intubation. The study was carried out in patients of Guillian Barre Syndrome (GBS) to evaluate whether tracheostomy compared to prolonged intubation, minimizes the period of ventilation, ICU stay and mortality.

Methods: A case control study was carried out between two groups of (GBS) patients who required mechanical ventilation. The study lasted 3 years (January 2008 to December 2010) and involved 40 patients who were splitted into 2 groups: the Tracheotomy Group (TG, n=20), where a tracheotomy was carried subsequent to the initial phase of tracheal intubation; and the Intubation Group (IG, n=20), in which intubation was kept on all the way to the period of hospitalization till discharge or death. Both the groups were similar in age and sex. We observed the entire period of ventilation in addition to the mean extent of hospital stay in the ICU and the death rate.

Results: There was no significant statistical reduction in the length of mechanical ventilation for the TG: (24 ± 8.08 days) days compared to the IG: (37.30 ± 11.58 days) days (p=0.185). There was no significant difference in complications (p=0.165) and mortality (TG 15 % vs. IG 20 %; p = 0.677) between the two groups.

Conclusion: No statistical difference in ventilation duration, hospital stay and mortality was found between tracheostomy and intubation groups.

KEY WORDS: *mechanical ventilation, tracheostomy, prolonged intubation,*

INTRODUCTION

The incidence of tracheostomy among patients admitted in medical intensive care units (ICUs) varies from 30% to 47% depending upon the cause. Prolonged mechanical ventilation is the major indication to carry out this procedure.¹ Tracheostomy surpasses tracheal intubation in terms of reduced airway resistance, easier suction and negligible mobility of the tube inside trachea, smaller dead space and above all enormous patient relief.² Even though tracheostomy is a safe procedure in the hands of ICU physicians,² it may cause tracheal infections, hemorrhage and stenosis.³ Many critically ill patients' families are hesitant in authorizing tracheostomy because of cosmetic issues and speech problems. We carried out this study to evaluate the role of tracheostomy in reducing the ventilation period, ICU stay and mortality in patients admitted to ICU with GBS.

PATIENTS AND METHODS

A prospective, comparative study was carried out between two groups of (GBS) patients who required mechanical ventilation in Pediatric ICU at Children Hospital, Lahore. The study lasted 3 years (January 2008 to December 2010) and involved 40 patients splitted into 2 groups: the Tracheotomy Group (TG, n=20), where a tracheostomy was carried subsequent to the initial phase of tracheal intubation; and the Intubation Group (IG, n=20), in which intubation was kept on all the way to the period of hospitalization till discharge or death. Both the groups were similar in age and gender. We observed the entire period of ventilation in addition to the mean extent of hospital stay in the ICU and the death rate.

Tracheostomy was performed using standard surgical techniques at bedside in the ICU, and no patients underwent percutaneous tracheostomy.

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The timing of tracheostomy depended on the attending physician's decision.

The parameters in each group were compared using Chi-2 test when necessary for qualitative variables. We compared qualitative variables using Student's t test. P < 0.05 was considered significant. All data were analyzed with SPSS 17.0 for Windows.

RESULTS

A total of 40 patients, who required mechanical ventilation were recruited in our study. The mean age was 8 ± 4 years (1-16). All patients were suffering from Guillian Barea syndrome. Sixteen were females and 24 were males. Half of the patients underwent tracheostomy. The mean

length of stay for all patients in ICU was 30. ± 11.94 days (5 – 56) with a median of 35. The mean time for MV patients was shorter in TG (24 ± 8.08 days) than in IG (37.30 ± 11.58 days) but not clinically significant (p=0.185). Tracheostomy was done between the 10th day and the 15th day. Fifteen patients underwent complications like pneumonia and sepsis but there was no significant difference between the two groups (p=0.165). (Table no.1)

No tracheal stenosis was noted in the two groups. Statistically, there was no difference in mortality in the ICU (TG 15 % vs. IG 20 %; p = 0.677). Six patients could not afford Intravenous gamma globulins and 5 of them expired (p=0.000)

Table 1: Complications in GBS patients on ventilators in ICU

	Tracheostomy Done		Total
	No	Yes	
Complications Anoxic Brain Injury	1	0	1
None	15	10	25
Pneumonia	1	7	8
Sepsis	2	2	4
Urinary Tract Infection	1	1	2
Total	20	20	40

DISCUSSION

History of tracheostomy dates back to 2000 BC as in 'The Rig-Veda' a case was described as a healed tracheostomy incision.⁴ Patients in need of prolonged ventilation admitted to medical ICU most often undergo tracheostomy. It has a lot of advantages including patient comfort, improved suction, less chances of laryngeal ulcerations, better nutrition and early discharge from ICU. ⁵ We carried out this study to evaluate this procedure in our intensive care unit.

Bouderka highlighted that tracheostomy may decrease the ventilation days in ICU in patients suffering from head injury and severe pneumonias.⁶ Our study could not yield such results where prolonged intubation and tracheostomy groups had no statistically significant difference in total ICU stay.

We could not find any difference between both the groups regarding the development of complications like pneumonia and sepsis. Stauffer concluded in a study of 150 patients that prolonged

intubation culminates into reduced chances of tracheal complications than tracheotomy (62% versus 66%), particularly tracheal stenosis (19% versus 65%).⁷

According to Berlauk and Rodriguez tracheotomy reduces mortality among ICU patients who required mechanical ventilation.^{8,9} But in our study population restricted to Guillian Barre Syndrome we did not find any difference in the mortality whether the patients underwent tracheostomy or not. The main factor which was significant in affecting the survival was the availability of intravenous immune globulins.

While many benefits are attributed to tracheotomy in ICU patients requiring mechanical ventilation (MV). We are still indecisive of factual advantages and the most favorable timing of tracheotomy.

CONCLUSION

The comparative studies show that the performance of a tracheostomy, versus prolonged

intubation, was not associated with lower mortality in ICU. Moreover there was no difference in the duration of ICU stay and the mortality. A small study population as in our study is underpowered to illustrate any firm conclusions. Therefore a larger study may reveal whether patients would benefit from a tracheostomy or not compared to endotracheal intubation.

Contribution by Authors

The article was conceived and designed by Dr. Imran Saeed. Analysis and data interpretation were done by Dr. Zulqarnain and Dr. Sarwar. Dr. Haroon and Dr. Zulqarnain revised the article clinically and finally approved by Dr. Imran Saeed. Dr. Haroon and Dr. Sarwar collected the data and the material, patients and resources were provided by Dr. Imran. Literature was researched by Dr. Zulqarnain, whereas technical and logistic support was provided by Dr. Imran Saeed.

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