



INDICATIONS OF TRACHEOSTOMY AND QUALITY OF LIFE POST-DECANNULATION IN CRITICALLY ILL PATIENTS

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ABSTRACT

Introduction: For patients who are critically ill, tracheostomy has many advantages over prolonged trans-laryngeal intubation because it provides reduced laryngeal trauma, easier pulmonary toilet, high level of comfort and often facilitation of ventilator weaning. But, the tracheostomy timing (early vs late) has been a controversy, with recent times evidence suggesting earlier the procedure done can reduce the duration of ventilation and sedation time, but without much change on overall duration of ICU stay.[1]

Aims and Objectives:

1. To determine and enumerate the indications of tracheostomy in a tertiary care hospital.
2. To assess the quality of life post decannulation.

Material and Methods: Study Design: This was a prospective observational study **Study Setting:** This was a hospital based study conducted at Intensive care units of PES Hospital, Kuppam **Results and Conclusion:** The current study revealed that a major proportion of tracheostomised patients in the post decannulation phase in the intensive care setting continue to have poor overall quality of life and also a poor perception of health, with most of the WHOQOL-BREF domains showing moderate rather than good scores. Age, gender and duration of tracheostomy did not show any statistically significant associations with quality of life, which mean, the impact of critical illness and tracheostomy is widespread across subgroups. These findings are in line with the growing body of evidence that survivors of prolonged ventilation and tracheostomy face enduring physical, psychological, social and environmental challenges. Therefore it clearly points out to the fact that integration of systematic quality of life assessment and multidisciplinary rehabilitation should be included in routine post-tracheostomy care regularly so that in the long-run the outcomes are enhanced and a meaningful life is restored for these patients.

KEYWORDS :

INTRODUCTION

Indications of tracheostomy in intensive care units (ICU) are dominated by the need to protect the airway and to have prolonged mechanical ventilation, while getting a tracheostomy done and its subsequent decannulation have a range of physical, psychological and social effects on quality of life (QOL) of patient. In ICU patients, exploring both why tracheostomy is performed and how patients cope up after decannulation is required for optimizing decision making in ICU and rehabilitation.[1]

For patients who are critically ill, tracheostomy has many advantages over prolonged trans-laryngeal intubation because it provides reduced laryngeal trauma, easier pulmonary toilet, and high level of comfort and often facilitation of ventilator weaning. But, the tracheostomy timing (early vs late) has been a controversy, with recent times evidence suggesting earlier the procedure done can reduce the duration of ventilation and sedation time, but without much change on overall duration of ICU stay[1].

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MATERIAL AND METHODS:**Study Design:**

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Sampling Method:

A Purposive sampling technique was used in this study

Inclusion and Exclusion criteria:**Inclusion Criteria:**

1. All patients of the intensive care unit.
2. Either sex who had undergone tracheostomy was included in this study.

Exclusion Criteria:

1. The patients with repeat tracheostomy.
2. Those who had tracheostomy performed in other hospitals are excluded from the study.

Study Tools

The WHO's Quality of Life questionnaires are standard instruments created by the World Health Organization to measure a person's quality of life across different domains. This questionnaire can be used in both healthy and ill populations. There are two main versions - a) 100 items - WHOQOL-100 (long) and b) 26 items - WHOQOL-BREF (abbreviated). However both these instruments are meant for cross-cultural use.

RESULTS

The distribution of age shows middle-aged adults as the major group (33.33%), followed by older adults (31.82%), which is proportionate to higher burden of trauma and chronic diseases in these age groups. The mean age of the study participants was 58.18 ± 19.74 years and the age ranged between 20 years to 88 years.

Table 1: Distribution of Participants by Duration of Tracheostomy (n = 66)

Duration of Tracheostomy	Frequency (n)	Percentage (%)
Short duration (≤ 7 days)	19	28.79%
Intermediate duration (8-14 days)	18	27.27%
Prolonged duration (15-28 days)	18	27.27%
Long-term tracheostomy (>28 days)	11	16.67%
Total	66	100.00

The pattern of duration of tracheostomy were distributed evenly across - short (28.79%), intermediate (27.27%), prolonged (27.27%) and long term (16.67%) categories, demonstrating a heterogeneous group with a range of weaning trajectories.

Table2: Distribution of Participants According to Indications for Tracheostomy (n = 66)

Indication for Tracheostomy	Frequency (n)	Percentage (%)
Difficulty intubation	2	3.03%
Neurological impairment	13	19.70%
Severe lung disease	4	6.06%
Upper airway obstruction	3	4.55%
Prolonged ventilation	44	66.67%
Total	66	100.00

Prolonged mechanical ventilation was the major (66.67%) indication, followed by neurological impairment (19.70%), severe lung disease (6.06%), upper airway obstruction (4.55%) and difficulty in intubation (3.03%).

Table 3: Distribution of Participants by Quality of Life Post Decannulation (n = 66)

Quality of Life	Frequency (n)	Percentage (%)
Poor	46	69.70%
Moderate	20	30.30%
Total	66	100.00

Majority (69.70%) of the patients who underwent decannulation post tracheostomy subjectively felt that they had a poor quality of life. The WHO's Quality of Life questionnaires are standard instruments created by the World Health Organization to measure a person's quality of life across different domains.

Table 4: Distribution of Participants by Physical Quality of Life (n = 66)

Physical domain of QOL	Frequency (n)	Percentage (%)
Poor	14	21.21%
Moderate	35	53.03%
Good	17	25.76%
Total	66	100.00

The domain of physical health among the study participants revealed, it was poor and good in 21.21% and 25.76% respectively. While more than 50% of them had a moderate level of physical health (53.03%).

Table 5: Distribution of Participants by Psychological Quality of Life (n = 66)

Psychological domain of QOL	Frequency (n)	Percentage (%)
Poor	22	33.33%
Moderate	38	57.58%
Good	6	9.09%
Total	66	100.00

It was observed that majority (57.58%) of the study participants had moderate psychological health. But a significant 33.33% of them had poor psychological health.

Table 6: Distribution of Participants by Social Quality of Life (n = 66)

Social domain of QOL	Frequency (n)	Percentage (%)
Poor	14	21.21%
Moderate	52	78.79%
Total	66	100.00

None of the patients had a good social quality of life. Majority (78.79%) of the study participants had moderate social QOL followed by 21.21% with poor social QOL.

Table 7: Distribution of Participants by Environmental Quality of Life (n = 66)

Environmental Domain of QOL	Frequency (n)	Percentage (%)
Poor	13	19.70%
Moderate	45	68.18%
Good	8	12.12%
Total	66	100.00

Majority (68.18%) of the patients had a moderate environmental domain of QOL, while 19.70% and 12.12% of them had a poor and good QOL in the environmental domain.

As the age increases the quality of life becomes better post decannulation except the younger age group. But the chi-square analyses revealed no significant associations between age group and QOL Domain 1 ($\chi^2 = 2.55$, $df = 3$, $p = 0.467$)

DISCUSSIONS

The most common indication for tracheostomy in this study was prolonged mechanical ventilation followed by neurological impairment, severe lung disease, upper airway obstruction and difficult intubation. This finding is in line with many studies done where prolonged ventilation is the predominant indication (accounting for two-thirds or more of adult tracheostomies). Also many studies report neurological causes such as stroke, head injury and neuromuscular disorders, and airway obstruction due to malignancy or trauma, as major reasons for tracheostomy. [2,3,4,5]

In terms of diagnoses, head injury and poisoning each formed about one-fourth of cases in this study, followed by shock and renal disease. Studies from tertiary centres across India and other low and middle income countries have also showed similar diagnosis pattern (head

injury, organophosphate poisoning, septic shock, and acute respiratory failure being frequent antecedents to prolonged ventilation and tracheostomy). Such patterns have significant implications for rehabilitation and quality of life. Different patients experience different behaviours. For example, patients with head injury may experience long term neurocognitive deficits, behavioural changes and dependence in activities of daily living, likewise with poisoning or septic shock often have lingering weakness, neuropathy and psychological distress. These post effects may contribute greatly to poor quality of life even after decannulation [6,3,4,7,8].

The study population in our study had almost equal distribution across short, intermediate, prolonged and long term tracheostomy durations. According to various studies, prolonged mechanical ventilation and delayed weaning have been associated with higher mortality and more complications with worse functional outcomes. But, the duration of tracheostomy did not show a statistically significant association with overall quality of life or global health perception at the time of assessment. [4,5,7]

In this study population, although all patients with very long term tracheostomy (≥ 28 days) showed poor overall health, the difference in categorical quality of life outcomes across duration groups was not statistically significant. This could be due to small sample size in each of the categories. It is also evident that at the time of decannulation, a few negative effects of prolonged tracheostomy (difficult communication and dependence on nursing care) fades away, leading to a convergence of quality of life scores across duration groups, as suggested by various other studies. [10,3]

A important finding in this study is that almost 70% of patients rated their overall quality of life as poor and more than 80% perceived their overall health as poor post decannulation. When domain wise quality of life was assessed using the WHOQOL-BREF questionnaire, most patients showed moderate scores across all domains (physical, psychological, social and environmental), with a substantial proportion reporting poor scores and only a minority reporting good quality of life in any domain. These findings indicate that successful decannulation does not mean full recovery, and that significant impairments continue to persist in multiple areas of life even after removal of the tube.

Our findings are in line with studies that specifically examined the quality of life before and after decannulation. A mixed methods study conducted among tracheostomy patients followed up for six months after post decannulation found that loss of voice during the tracheostomy phase lead to substantial emotional distress and decreased participation, while the restoration of voice around decannulation was associated with improved mood, outlook and sense of recovery. But the overall quality of life remained below normal levels for many patients. These findings suggest that decannulation is an important step but does not fully reverse the cumulative physical and psycho-social impact of prolonged ventilation and tracheostomy. [10]

In this study, the domain wise pattern revealed that physical health was predominantly moderate, with about one-fourth reporting good physical quality of life, whereas psychological, social and environmental domains had higher proportions of poor or moderate scores. Several researchers have noticed that physical functioning recovers to some extent as these patients get back their strength and mobility, but psychological and social domains does not reverse, maybe due to anxiety, depression, stigma and reduced social engagement. Various environmental factors such as financial strain, access to healthcare, transport difficulties and need for continued caregiver support further elevates the difficulty in recovery pathway. The moderate but not good scores in most WHOQOL-BREF domains in the current study population therefore shows the complex interplay of physical limitations, emotional distress, social role changes and environmental barriers. [6,2,3]

The role of duration of tracheostomy in determining quality of life is also very complex. Some studies reveal that longer duration may be associated with more complications, which could worsen quality of life. On the contrary, other studies have not found a direct linear relationship, possibly because patients who go through a very prolonged tracheostomy and reach decannulation represent have better resilience, family support and access to rehabilitation. In this group of patients, all long term tracheostomy patients reported poor overall

health which was clinically notable, even though statistical significance was not found, likely due to small sample size in the subgroups. Clinicians should therefore be more vigilant about the patients with long duration of tracheostomy and provide them a structured rehabilitation for this group. [4,11]

Compared with rest of the studies, the present study specifically examined patients after decannulation rather than those living with a long term tracheostomy. Despite tube removal, overall and domain wise quality of life remained below par, pointing towards the negative effects of the critical illness and the period of tracheostomy existed beyond the intensive care phase. This is in line with broader post intensive care syndrome studies showing that survivors of critical illness often have prolonged impairments in physical function, cognition, mood and participation for months and years together. [7,11]

The high burden of moderate-to-poor psychological, social and environmental quality of life highlights the need for multiple department follow-up clinics (physiotherapists, speech and language therapists, psychologists, social workers and rehabilitation specialists). Early mobilisation, respiratory physiotherapy and swallow rehabilitation can definitely improve physical functioning, while timely speech therapy and assistive communication devices can reduce the distress associated with loss of voice during the that period. Anxiety, depression and social stigma among this population can be handled with proper psychological counselling, peer support groups and family education. [10,3]

Strengths and Limitations

This study focuses specifically on a group that is less frequently studied (who have undergone decannulation, compared to those with permanent tracheostomy or those still in the acute intensive care phase). The use of WHOQOL-BREF, a standard and widely accepted tool helps in comparison with studies from other settings and also be used to do a domain wise interpretation of quality of life.[12] This heterogeneous group of indications and durations shows the real world ICU practice in a tertiary care centre.

However, certain limitations are also present. The sample size was small, which may have limited the statistical power to detect subtle associations between demographic or clinical factors and quality of life outcomes. Generalisability to other hospitals with different patient profiles, resources and follow-up practices of the study might not be possible as it has conducted in a single tertiary care centre.

Another limitation is that only selected demographic and clinical variables were evaluated as potential determinants of quality of life. Other factors such as socioeconomic status, educational level, preexisting psychiatric illness, comorbidity burden, and severity of illness scores and availability of rehabilitation services were not considered, though they have been shown to influence quality of life in tracheostomy and intensive care survivors. This could not be collected as it was difficult in the ICU setting. Finally, quality of life was based on self reported categories (poor, moderate, good), which is subjective in nature and that could have been influenced by cultural expectations and psychological adaptation.

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