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Quality of life improves with return of voice in tracheostomy patients in intensive care: An observational study☆,☆☆

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ABSTRACT

Purpose: To measure patient-reported change of mood, communication-related quality of life, and general health status with return of voice among mechanically ventilated tracheostomy patients admitted to the intensive care unit (ICU).

Materials and Methods: A prospective observational study in a tertiary ICU was conducted. Communication-related quality of life was measured daily using the Visual Analogue Self-Esteem Scale. General health status was measured weekly using the EuroQol-5D.

Results: Aspects of communication self-esteem that significantly improved with the return of voice were ability to be understood by others ($P = .006$) and cheerfulness ($P = .04$), both with a median difference from before to after return of voice of 1 on the 5-point scale. Return of voice was not associated with a significant improvement in confidence, sense of outgoingness, anger, sense of being trapped, optimism, or frustration. Reported general health status did not significantly improve.

Conclusions: Return of voice was associated with significant improvement in patient reported self-esteem, particularly in being understood by others and in cheerfulness. Improved self-esteem may also improve quality of life; however, further research is needed to confirm this relationship. Early restoration of voice should be investigated as a way to improve the experience of ICU for tracheostomy patients.

1. Introduction

Admission to an intensive care unit (ICU) can have a deleterious effect on a patient's mood and quality of life (QOL) [1]. Altered mood, with a dominance of negative emotions including fear, depression and anxiety, occurs in patients while in the ICU [2–5] and after discharge from the hospital [3,5–12]. Up to 75% of patients experience anxiety and 40% report depressive symptoms from being in ICU [13].

A tracheostomy is a procedure commonly used to manage long-term ventilated patients in the ICU. The presence of a tracheostomy tube with an inflated cuff significantly impacts upon an individual's ability to effectively communicate, to interact, and to participate within the health system. Approximately 24% of mechanically ventilated patients within an ICU require a tracheostomy tube [14] and annually are within the top diagnostic reference groups that account for the most admitted bed days in Australia [15].

The act of communication is understood to be paramount to an individual's ability to participate in any activity of daily living and therefore is related to QOL [16]. Ineffective communication and loss of voice are reported as leading directly to anxiety [19–21], frustration [17,20,22–25], anger [17], fear [17,23,24,26], a sense of depersonalization [22,24,25,27], powerlessness [22–24,28], and a sense of futility [29]. Loss of the ability to communicate accurately within the ICU also prompted a sense of lost personal identity [17], flat affect/depression [18], and withdrawal of patient participation [22].

Chlan [19] quantified the severity of mood disturbance experienced by patients during the intubation period and found that moderate levels of anxiety were reported from a cohort of 192 patients (mean scores were 49 on a scale from 20 to 80, where higher scores indicate greater anxiety). Menzel [26] quantified emotional responses to voicelessness during intubation in 29 ICU patients. Mean scores were 23 on a 0 to 60 scale for anger and 12 on a 0 to 25 scale for worry/fear, with higher scores indicating increased levels of that emotion. The differences in scores reported during intubation and after extubation were not statistically significant. Patak et al [20] interviewed 29 patients after

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extubation about their intubation period as well as asking them to rate their frustration levels on 1 to 5 scale, with 62% of patients reporting high levels of frustration (score 4 or 5) associated with voicelessness.

The quantitative data from existing studies does, however, have some limitations. Only 4 of the emotions identified by the qualitative research have been quantified. Some of the data were collected retrospectively, which introduces important potential for bias toward underestimation of the severity of the mood disturbance [26]. Perhaps most importantly, none of the studies have specifically investigated the change in mood with return of voice. This is despite a recent increase in reporting of general health-related QOL in patients admitted to ICU who received mechanical ventilation at various time points [1,30–33]. Data about the rapid decline in health-related QOL during ICU admission identify poor communication as one of the most annoying factors during mechanical ventilation [32]. However, the absence of quantitative data specifically from around the time of return of voice is important because patients may attribute their mood disturbance to voicelessness, but this may be confounded by patients in ICU having reduced mood regardless of voice status, as discussed above.

Real-time quantitative data on a comprehensive range of emotions both before and after return of voice are needed specifically from tracheostomy patients in ICU. This is because the effects on mood may be more relevant in tracheostomy patients than in patients with an endotracheal tube due to tracheostomy patients typically being more alert and aware of their circumstances. This study, therefore, sought to describe the changes in communication-related QOL and general health status that occur with the return of voice, as reported by patients who have been without their voice due to the presence of a tracheostomy while in an ICU.

2. Materials and methods

2.1. Participants and setting

Adult patients in a large metropolitan Australian ICU participated in the study. Participants were recruited from within a larger randomized trial of communication intervention [34]. Recruitment and enrollment are outlined below. All tracheostomy patients were consecutively screened during the scheduled recruitment periods and enrolled if eligibility criteria were met. Written consent was gained from each participant or person responsible. Recruitment continued until the sample size was achieved for the larger trial.

All participants had undergone a tracheostomy and experienced voicelessness during mechanical ventilation. All participants progressed through the tracheostomy pathway including the following: cuff deflation, assessment and management of swallowing, and communication assessment, which included provision of a speaking valve by a speech-language pathologist (SLP).

The eligibility criteria from the larger trial were used: >18 years of age, tracheotomy in situ more than 48 hours, air-filled tracheostomy cuff, had received mechanical ventilation more than 48 hours, had progressed to spontaneous breathing, able to trigger ventilation support, voicelessness for more than 48 hours, awake, able to complete the outcome measures of this study, medically stable as decided by the treating intensive care specialist medical consultant, oxygen saturation level higher than 88%, heart rate between 40 and 120 beats/minute, and systolic blood pressure between 90 and 160 mm Hg.

Patients were excluded if there was any contraindication to deflation of the tracheostomy cuff as reported by the treating intensive care specialist. Clinical diagnoses including bulbar palsy, a brainstem stroke, and recent head and neck surgery were also excluded because of heightened aspiration risk.

Ethics approval was given by Sydney Southwest Area Health Service Protocol X09-0380 & HREC/09/RPAH/643, and registration was completed prospectively on www.ANZCTR.org.au, protocol number ACTRN12610000075088.

2.2. Outcome measures

Quality of life was measured with 2 tools: the Visual Analogue Self-Esteem Scale (VASES) [35] for aspects of communication-related QOL, and the EuroQol-5D questionnaire (EQ-5D) [36] for general health status. During their stay in ICU, participants completed the VASES on weekdays and the EQ-5D weekly until both measures were recorded once after the return of voice. An independent assessor, not involved in the provision of patient care, administered the tools and collected the data.

The VASES [35] consists of 10 items represented pictorially with a bipolar scale. The 10 items include: not being understood/being understood, not confident/confident, cheerful/not cheerful, outgoing/not outgoing, mixed up/not mixed up, intelligent/not intelligent, angry/not angry, trapped/not trapped, not optimistic/optimistic, and frustrated/not frustrated. An evaluation of the scales has shown strong internal validity in populations both with and without neurologic injury impacting language function, with a Cronbach α of .86 [35]. Vickery [37] endorsed the VASES as a measurement of self-esteem and reported that results of the VASES were not influenced by patient demographics, cognitive functioning, visual acuity difficulties, or neglect in individuals after acute stroke [38]. Brumfitt and Sheeran [35] endorsed the use of the VASES in other patient populations with acquired communication disorders and report that the VASES "could serve as a valuable outcome measure for both psychological and linguistic interventions…thus enhancing service delivery" (p. 397). The assessment of communication-related QOL with the VASES before and after intervention has been supported in published literature [39]. Although we administered the full tool to preserve its psychometric validity, we elected a priori not to analyze 2 items (intelligent/not intelligent and mixed up/not mixed up) due to their limited potential to be affected by the return of voice.

The EQ-5D is a standardized tool to measure the patients' perception of their general health status. The tool contains a descriptive profile of 5 dimensions of health status (mobility, self-care, usual activities, pain/discomfort, and pain/anxiety) and a visual analog scale of general health status. The visual analog scale is a 20-cm scale, with scores ranging from 0 (worst imaginable health state) to 100 (best imaginable health state). Although we administered the full tool to preserve its psychometric validity, we elected a priori to analyze only the visual analog scale data of the EQ-5D due to the limited potential of the 5 dimensions to be affected by the return of voice. It has a moderate to high convergent validity with measurements of patient-reported QOL in mechanically ventilated patients [40]. The EQ-5D has been widely used for the measurement QOL in patients admitted to ICU [41–43] and is recommended as one of the most appropriate instruments for this purpose [1].

2.3. Data analysis

Data were checked for logically impossible and extremely outlying data points, with correction of any identified errors before analysis. All available data were included in the analysis.

For the 8 items of the VASES that were analyzed, we calculated the within-participant change from the day before the return of voice to the day of return of voice. If a participant had not completed the VASES on the day before the return of voice, the preceding observation was carried forward. If the participant did not complete the VASES on the same day after the return of their voice, the next opportunity to complete the VASES was used. For the EQ-5D, similarly, change was calculated from the nearest measures before and after return of voice.

Descriptive statistics were used to summarize demographic data at baseline. Wilcoxon signed ranked tests were used to compare pre-voice and post-voice scores, with results reported as median differences and statistical significance reported as a *P* value.