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Dysphagia, Dysphonia, and Dysarthria Outcomes Among Adults Hospitalized With COVID-19 Across Ireland

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Objective: To investigate the presence, degree, predictors, and trajectory of dysphagia, dysphonia, and dysarthria among adults hospitalized with COVID-19 across the Republic of Ireland (ROI) during the first wave of the pandemic.

Study Design: Prospective observational cohort study.

Methods: Adults with confirmed COVID-19 who were admitted into 14 participating acute hospitals across ROI and referred to speech and language therapy between March 1st and June 30th, 2020 were recruited. Outcomes obtained at initial SLT evaluation and at discharge were oral intake status (Functional Oral Intake Scale), perceptual voice quality (GRBAS), and global dysarthria rating (Dysarthria Severity Scale).

Results: Data from 315 adults were analyzed. At initial SLT assessment, 84% required modified oral diets, and 31% required tube feeding. There were high rates of dysphonia (42%) and dysarthria (23%). History of intubation (OR 19.959, 95% CI 6.272, 63.513; $P = .000$), COVID-19 neurological manifestations (OR 3.592, 95% CI 1.733, 7.445; $P = .001$), and age (OR 1.034; 95% CI 1.002, 1.066; $P = .036$) were predictive of oral intake status. History of intubation was predictive of voice quality (OR 4.250, 95% CI 1.838, 9.827; $P = .001$) and COVID-19 neurological manifestations were predictive of dysarthria (OR 2.275; 95% CI 1.162, 4.456; $P = .017$). At discharge, there were significant improvements in oral intake ($Z = -7.971$; $P = .000$), voice quality ($Z = -5.971$; $P = .000$), and dysarthria severity ($Z = -2.619$; $P = .009$), although need for modified oral intake (59%), dysphonia (23%), and dysarthria (14%) persisted.

Conclusion: Dysphagia, dysphonia, and dysarthria were widespread among adults hospitalized with COVID-19 and they persisted for many at discharge. Prompt SLT evaluation is required to minimize complications.

Key Words: COVID-19, SARS-CoV-2, dysphagia, swallowing, voice, dysphonia, dysarthria, communication, sequelae.

Level of Evidence: 3

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INTRODUCTION

Coronavirus (COVID-19) is a potentially severe acute respiratory infection caused by the novel coronavirus severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2).[1] Adults admitted into hospital with severe COVID-19 infection can present with multi-system manifestations of COVID-19.[2] These multi-system complications in combination with pre-existing disease and iatrogenic complications can compromise swallowing, voice, and motor speech.

Respiratory compromise associated with severe COVID-19 infection can alter respiratory swallowing coordination and can limit breath support for speech and voice production.[3] COVID-19 can also penetrate into the nervous system leading to central and peripheral nervous system features such as anosmia, delirium, encephalopathy, Guillain Barre syndrome seizures, and stroke. Many of these neurological presentations can lead to dysphagia, dysphonia, and dysarthria.[4–6] Adults with severe COVID-19 infection frequently present with deconditioning, disuse muscle atrophy, and critical illness myopathy during hospital admission, which can impact on muscles involved in swallowing, voice, and speech.[7]

Adults requiring intensive care treatment for critical COVID-19 infection can present with iatrogenic swallowing and voice difficulties.[8] Variables associated with post-extubation dysphagia and dysphonia include duration of intubation, number of extubation attempts, and cuff pressure during intubation.[9–12] Intubation can cause laryngeal injury, including vocal cord paralysis, granuloma, and stenosis all of which could alter swallowing and voice.[13] Some adults require tracheostomy post-extubation to wean from mechanical ventilation and a high incidence of laryngeal injury has been found among adults with tracheostomy.[14] It has also been hypothesized that proning of adults with severe COVID-19 in intensive care unit (ICU) can lead to central and peripheral nervous system complications and laryngeal injuries.[15]

Dysphagia can cause aspiration pneumonia, lead to prolonged ICU stays, and delayed weaning from tracheostomy and tube feeding.[10,16] The impact of dysphagia on healthcare costs and length of stay (LOS) has been established.[17] Furthermore, dysphagia, dysphonia, and dysarthria can each impact on quality of life.[18–20] Identification of the presence and nature of dysphagia, dysphonia, and dysarthria can also be useful from a differential diagnosis viewpoint, as they often signal the presence of underlying disease. Despite this, limited research has explored swallowing, voice, and motor speech difficulties among adults with COVID-19 to inform service planning and delivery.

One recent study found swallowing and voice difficulties were highly associated with intubation among 164 adults admitted into an acute care setting with COVID-19.[8] Despite an overall trajectory of improvement, many required out-patient follow-up for dysphonia and dysphagia.[8] In another study, 29% of adults admitted into an acute hospital with COVID-19 were referred to speech and language therapy for a swallowing assessment and 21% and 76% required an altered oral fluids and diet, respectively.[21] In one study, swallow and voice difficulties among 41 adults who had a tracheostomy as part of COVID-19 medical management were examined.[14] Over half presented with altered perceptual voice quality and 30% of adults reported abnormal swallowing.[12] No research was found that has focused on dysarthria among adults admitted into acute care with COVID-19.

In the Republic of Ireland (ROI), the first wave of the COVID-19 pandemic ranged from mid-March to end of June 2020.[22] By 27th June 2020, 3,293 adults with COVID-19 (12.95% cases) had been admitted into acute hospitals across the ROI and 434 people had been admitted into intensive care with COVID-19 across Ireland by 30th June 2020.[22] Speech and language therapy (SLT) dysphagia and communication evaluation and intervention practices were drastically altered during this time to minimize transmission risk.[23,24] This study aims to establish and characterize the presence, severity, and trajectory of swallowing, voice, and motor speech difficulties among adults admitted into acute hospitals with COVID-19 across the ROI during the first wave of the pandemic (March 1st to June 30th, 2020) and to identify predictors of these presentations within this population to inform service planning and delivery.

Specific research objectives were:

1. To characterize the presence, degree, and trajectory of swallowing, voice, and motor speech difficulties among adults hospitalized with COVID-19 across the ROI
2. To identify predictors of swallowing and communication difficulties among adults with COVID-19 who are admitted into acute care across ROI during the first pandemic wave.
3. To establish an association between dysphagia, dysphonia, dysarthria, and hospital LOS.

METHODS

Study Design

This was a multi-site prospective observational cohort study. The study is reported according to the strengthening the reporting of observational studies in epidemiology guidelines for observational cohort studies.[25] Ethical approval was obtained from the National Research Ethics Committee (NREC) (20-NREC-COV-051).

Settings

Fourteen SLT departments based in acute hospital settings across ROI participated in this study. Data from adults with polymerase chain reaction (PCR) test-confirmed COVID-19 who were admitted into a participating acute hospital in the ROI and referred to SLT were analyzed.

Participants

All adults admitted into a participating acute hospital in the ROI with COVID-19 and referred to SLT were included. Inclusion criteria for participants were 1) confirmed COVID-19 positive based on PCR test, 2) admitted into a participating acute hospital within the ROI between March 1st and June 30th, 2020 inclusive, 3) referred to SLT during hospital admission, and 4) consent obtained. Exclusion criteria were 1) age 16 years or younger, 2) unconfirmed COVID-19 infection, and 3) no consent obtained.

Independent Variables

Demographic data collated included patient age, gender, pre-admission medical history (stroke, progressive neurological disorder, chronic obstructive pulmonary disease, other respiratory condition, cancer, dementia, intellectual disability, mental health condition, diabetes, obesity, cardiology, other), and pre-admission oral intake status.

During hospital admission, data captured from hospital charts by the speech and language therapist included medical COVID-19 treatment and neurological manifestations of COVID-19. Where relevant, data on intubation and tracheostomy history during current inpatient stay were collated from medical notes. Hospital LOS was also recorded for all participants. The patient's most recent chest x-ray at time of initial SLT assessment was rated by the speech and language therapists using a validated five-point ordinal scoring system provided in the dataset dictionary.[26]

Swallowing and Communication Outcomes

Swallow and communication outcomes were obtained by speech and language therapists at initial SLT assessment and repeated at the time of hospital discharge. Outcomes were influenced by curtailed access during the pandemic to

instrumental assessments typically used in acute care settings.[23,24] Presence and severity of dysphagia were measured based on a clinical swallow evaluation using the Functional Oral Intake Scale (FOIS).[27] The FOIS is a validated seven-point ordinal rating scale with high inter-rater reliability.[27] Voice quality was evaluated based on a perceptual clinical assessment using the overall Grade (G) score from the grade, roughness, breathiness, asthenia, strain (GRBAS) scale.[28] The scale has established high rater reliability and is widely used in clinical research.[29] Motor speech was evaluated perceptually using the Dysarthria Severity Scale.[30] All outcomes selected are commonly used in clinical research and have proven rater reliability.

Data Sources/Management

One clinician from each site was nominated by local SLT managers to be responsible for data entry at each location and to transfer the anonymized data for collation and analysis. A dataset and dataset dictionary was provided to nominated clinicians at each participating site.

Bias

To minimize observer bias, all clinicians used outcome measures routinely used in clinical practice with established rater reliability. Clear rules and procedures were in place for data collection and data were clearly defined in a data dictionary provided to all settings. Merged data were anonymized to researchers.

Study Size

Any patients who meet the eligibility criteria over the 3-month data collection period were included in the study. The study size was determined by the prevalence of cases. Statistical advice was obtained regarding recruitment numbers and statistical power for the sample.

Statistical Analysis

Descriptive statistics were reported using medians and interquartile range (IQR) for continuous data. Categorical variables were presented as frequency (percentage). Variables were tested for normality using the Shapiro-Wilks test. To establish associations between dependent and independent variables, Spearman's rho correlations were conducted. To determine the course of dysphagia and communication difficulties from initial SLT assessment to time of discharge, medians of ordinal dependent variables at both time points were compared using two-tailed Wilcoxon signed-rank tests.

To determine independent predictors of oral intake status at time of initial SLT assessment, a binary logistic regression was used. The seven-point ordinal FOIS rating scale was divided into feeding tube reliant (FOIS Levels 1–3) and not tube feeding reliant (FOIS Level 4–7) categories as the binary dependent variable. To determine independent predictors of voice quality and motor speech at time of initial SLT assessment, ordinal logistic regression models were used. Dependent variables for each regression model were overall (G) GRBAS rating and Dysarthria Severity Scale ratings at initial SLT assessment. To prevent over-fitting the models, nine independent variables were selected (age, gender, history of intubation during current inpatient stay, COVID-19 neurological manifestations, pre-existing respiratory disease, pre-existing neurological disease, pre-morbid swallow status, cancer history, and chest x-ray rating). Independent variables were selected based on evidence from previous research and a visual review of the data. Where a significant association was identified between independent variables (e.g., tracheostomy insertion and history of intubation), only one was selected for a model. Mean imputation was made for two dependent variables (dysarthria and communication) where over 10% of data were missing (12% and 16%, respectively). Model fits were confirmed using likelihood ratio chi-squared tests. A two-sided α of less than 0.05 was considered statistically significant. Statistical analyses were completed using the SPSS (v26) software.

RESULTS

Recruitment and Patient Baseline Characteristics

Data from 315 adults (194 males and 121 females) with a median age of 76 years (age range 17–97 years) with PCR test confirmed COVID-19 infection who were referred to speech and language therapy across 14 acute hospital settings across Ireland between March and June 2020 was included.

Previous medical history of included patients and most recent chest x-ray findings at time of initial SLT assessment based on a validated chest x-ray scoring system[26] are captured in Table I. Thirty-two percent (100/315) were post-extubation (mean duration 14 days), 36 of whom had tracheostomy tubes inserted (Table I).

Presence, Severity, and Trajectory of Swallowing and Communication Difficulties

Swallowing. Pre-admission, median FOIS score was 7 (IQR 6–7) with over three quarters (76.3%) of participants on a normal (FOIS 7) or soft normal diet (FOIS 6). Pre-admission, 3.4% required tube feeding (FOIS 1–3) and 2.8% were nil by mouth (FOIS 1).

At initial SLT assessment, median FOIS reduced to 5 (IQR 2–6) and 84.2% required a modified oral diet (FOIS 1–6). A total of 31% of adults were tube reliant (FOIS level 1–3) and 22.8% (FOIS 1) were nil by mouth (Fig. 1). Oral intake status ratings within subgroups who were post-extubation versus nonintubated are in Figure 2. At time of discharge, median FOIS improved to FOIS level 6 (IQR 5–7) and there was a statistically significant improvement in oral intake status from initial SLT assessment to time of discharge ($z = -7.971$; $P = .000$). Nonetheless, 9.7% of participants remained tube reliant (FOIS Level 1–3) at discharge and 8.2% were nil by mouth (FOIS 1).

Voice. At initial SLT assessment, 42% presented with dysphonia based on perceptual voice quality ratings (GRBAS 1–3), with 20% in moderate (12%) and severe (8%) GRBAS categories (Fig. 3). Perceptual voice quality ratings in post-extubation and nonintubated subgroups are in Figure 2. Presence of dysphonia reduced to 23% at the time of discharge, with 6.5% and 3.3% in moderate and severe categories, respectively. There was a statistically significant improvement in median perceptual voice quality from initial SLT assessment to time of discharge ($z = -5.971$; $P = .000$).

Motor speech. At initial SLT assessment, 25% of participants presented with dysarthria (10% mild) based on Dysarthria Severity Scale ratings (Fig. 4). Dysarthria ratings in post-extubation and nonintubated subgroups

TABLE I.
Participant characteristics (N = 315).

Age	Median	76 yr
	Range	17–97 yr
	IQR	64–84 yr
Gender	Male	194 (61.6%)
	Female	121 (38.4%)
Admission source	Home	219 (69.5%)
	Nursing home	56 (17.8%)
	Residential setting	6 (1.9%)
	Clinical setting	28 (8.8%)
	Rehabilitation setting	1 (0.3%)
	Other	5 (1.6%)
Co-morbidities	Stroke	28 (9%)
	Progressive neurological disease	19 (6%)
	Dementia	50 (16%)
	Head and neck cancer	13 (4%)
	Cancer outside of head and neck	39 (12%)
	Chronic obstructive pulmonary disease	50 (16%)
	Other respiratory disease	39 (12%)
	Mental health condition	31 (10%)
	Intellectual disability	6 (2%)
	Diabetes	61 (19%)
	Obesity	31 (10%)
	Cardiology	123 (39%)
	Other	172 (55%)
Pre-existing disease	Pre-existing neurological disease	97 (31%)
	Pre-existing respiratory disease	89 (28%)
	Pre-existing cancer diagnosis	52 (17%)
Pre-admission oral intake status (as per Functional Oral Intake Scale)	1. Nothing by mouth	9 (2.8%)
	2. Tube dependent with minimal attempts of food/fluids	0 (0%)
	3. Tube dependent with consistent oral intake of food/fluids	2 (0.6%)
	4. Total oral diet with a single consistency	4 (1.3%)
	5. Total oral diet with multiple consistencies but requiring special preparation/compensations	50 (15.8%)
	6. Total oral diet with multiple consistencies without special preparation, but with specific food limitations	34 (10.8%)
	7. Normal, no restrictions	207 (65.5%)
	Missing	10 (3.2%)
Chest x-ray (most recent chest x-ray at time of initial SLT assessment) (Taylor et al.)[26]	1. Normal	39 (12.3%)
	2. Patchy atelectasis and/bronchial wall thickening	26 (8.2%)
	3. Focal consolidation	52 (16.5%)
	4. Multifocal consolidation	113 (35.8%)
	5. Diffuse alveolar changes	5 (1.6%)
	6. Other/missing	1 (0.3%)
		85 (27.2%)
Neurological manifest-ations of COVID	Present	94 (29.7%)
	Stroke	4
	Seizures	8
	Impaired consciousness	36
	Ataxia	2
	Encephalopathy/encephalitis	3
	Guillain Barre Syndrome	0
	Acute demyelinating encephalomyelitis (ADEM)	5

(Continues)

TABLE I.
Continued

	Delirium	48
	Other	2
Intubation	Post-extubation	100 (32%)
	Post-extubation and tracheostomy	36 (11%)
	Acute ward only	215 (68%)
Length of hospital stay (d)	Median	32
	IQR	18–55
Survival	Rest in peace during inpatient stay over 3-mo period (March to June 30th, 2020)	**N = 96/315 (30%)**

Bold values indicates statistically significant at 0.05 level.

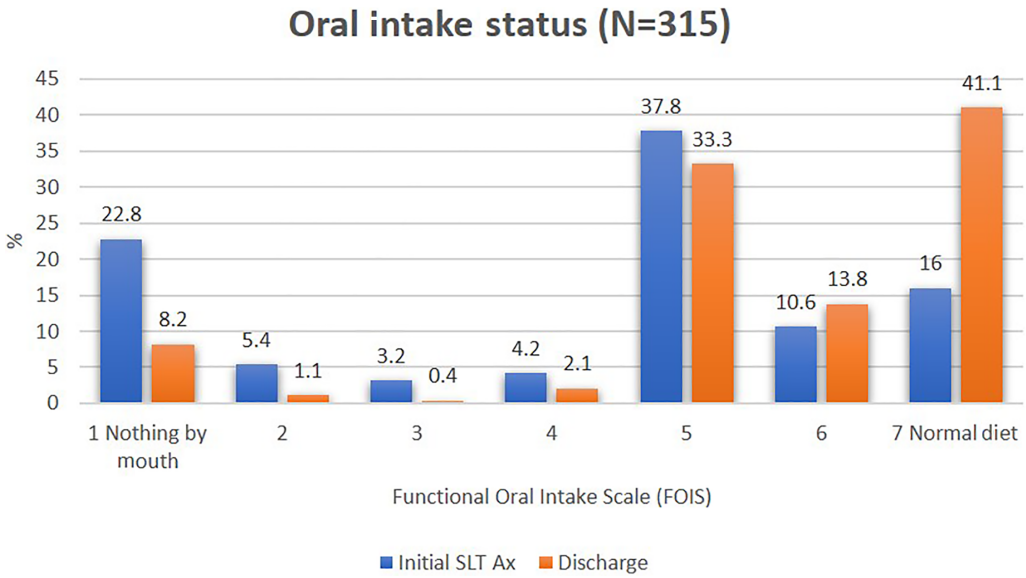

Fig. 1. Oral Intake status at initial SLT assessment. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

are in Figure 2. Dysarthria reduced to 14% at time of discharge (3% mild). There was a statistically significant improvement in motor speech quality from initial SLT assessment to time of discharge ($z = -2.619$; $P = .009$).

Variables Predicting Dysphagia and Communication Difficulties at Initial SLT Assessment

In a multivariate model, statistically significant predictors of oral intake status based on FOIS scores at initial SLT assessment included history of intubation (OR 19.959; 95% CI 6.272, 63.513; $P = .000$), neurological manifestations of COVID-19 (OR 3.592; 95% CI 1.733, 7.445; $P = .001$), and age (OR 1.034; 95% CI 1.002, 1.066; $P = .036$) (Table II).

In a separate multivariate model, the only statistically significant predictor of perceptual voice quality at initial SLT assessment was history of intubation (OR 4.250; 95% CI 1.838, 9.827; $P = .001$). In another multivariate model, a statistically significant predictor of dysarthria was neurological manifestations of COVID-19 (OR 2.275; 95% CI 1.162, 4.456; $P = .017$) (Table II).

Association between swallowing and communication difficulties and length of hospital stay. A significant negative association was observed between oral intake status at initial SLT assessment and length of hospital stay ($r = -0.141$, $P = .022$), indicating that the lower FOIS score, the longer the length of hospital stay. A significant positive association was observed between perceptual voice quality at initial SLT assessment and length of hospital stay ($r = 0.322$, $P = .000$). A significant positive association was observed between perceptual dysarthria rating at initial SLT assessment and length of hospital stay ($r = 0.145$, $P = .023$).

DISCUSSION

Main Findings

This is, to the authors knowledge, the first multi-site prospective study, which has examined swallowing, voice, and motor speech difficulties among adults hospitalized with COVID-19 infection. High rates of swallowing and communication difficulties were observed among adults hospitalized with COVID-19 across ROI and clear

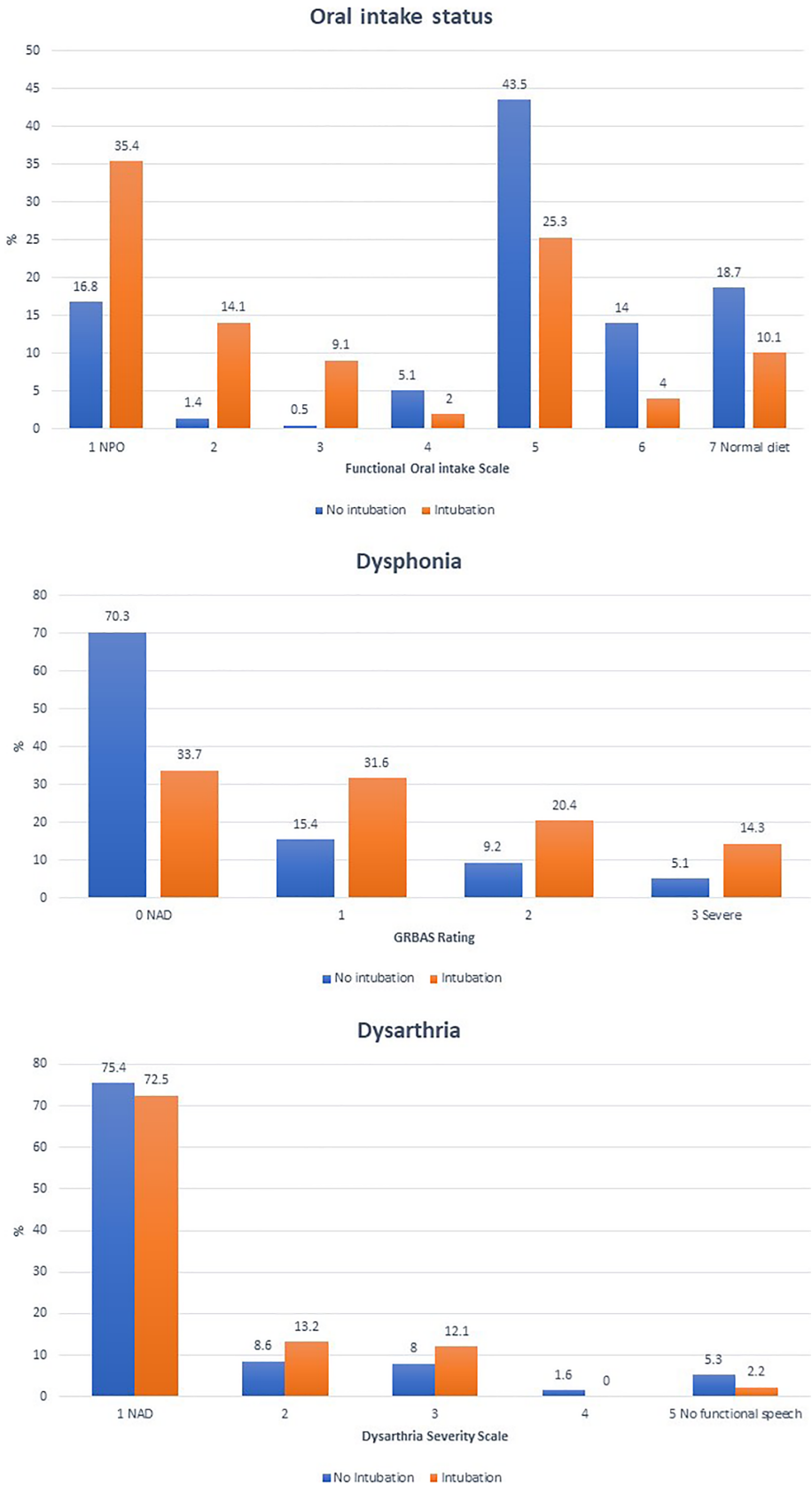

Fig. 2. Swallowing, voice, and speech outcomes in post-extubation (N = 100) and nonintubated (N = 215) subgroups at initial SLT assessment. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

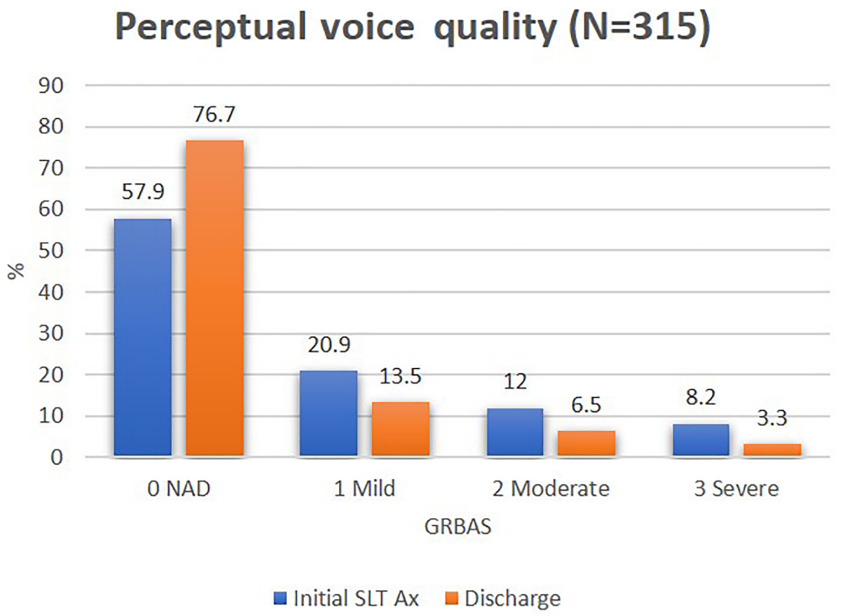

Fig. 3. Perceptual voice quality at initial SLT assessment. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

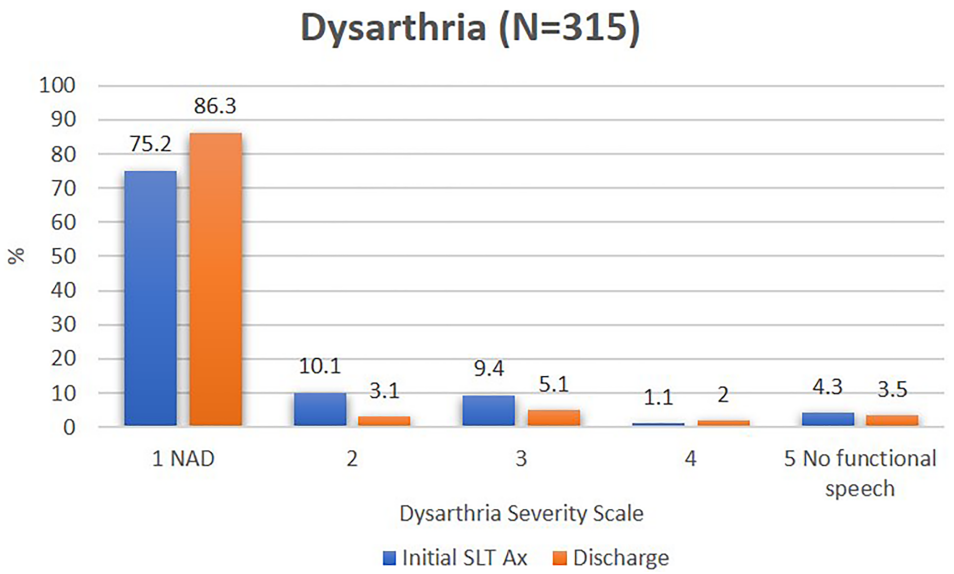

Fig. 4. Dysarthria at initial SLT assessment. [Color figure can be viewed in the online issue, which is available at www.laryngoscope.com.]

predictors of dysphagia, dysphonia, and dysarthria were identified, which may facilitate early identification and management of adults with dysphagia, dysphonia, and dysarthria associated with COVID-19. While communication and swallowing difficulties resolved for many at the time of hospital discharge, they persisted for a sizable subgroup who are returning to the community, suggesting that outpatient rehabilitation will be necessary to meet the needs of this cohort.

This study includes data on nearly 10% (315/3295) of those admitted into acute hospital across the ROI with COVID-19 by June 30th 2020.[22] These figures are likely to be an underestimation of swallowing and communication difficulties among adults with severe COVID-19 admitted into acute care across ROI as not all acute hospital settings in ROI participated in this study. Furthermore, figures were based solely on those referred to SLT and who consented to their data being included in this study.

Context of Previous Research

In this study, 31% of participants required modified diets and 23% were not allowed oral intake based on initial SLT assessment. In previous research, 10% remained tube reliant at discharge and 8% remained nil by mouth.[8,21] This number of participants with persistent

TABLE II.
Predictors of dysphagia, dysphonia, and dysarthria among adults hospitalized with COVID-19 across ROI during the first pandemic wave.

	Independent variable	B	SE	Odds ratio	95% of CI for OR Lower	Upper	*P* value
Oral intake status	**Age**	**0.033**	**0.0158**	**1.034**	**1.002**	**1.066**	**.036***
	Gender	0.239	0.3775	1.269	0.606	2.660	.528
	Post-extubation	2.994	0.5906	19.959	6.272	63.513	.000*
	Pre-existing neurological disease	−0.690	0.5209	0.501	0.181	1.392	.185
	COVID-19 Neurological manifestation	**1.279**	**0.3719**	**3.592**	**1.733**	**7.445**	**.001***
	Pre-existing respiratory disease	0.136	0.4152	1.145	0.508	2.585	.744
	Pre-morbid swallow status	−0.553	0.1693	0.575	0.413	0.802	.001
	Cancer diagnosis	0.602	0.5007	1.825	0.684	4.869	.230
	Chest status (as per chest x-ray rating)	−0.102	0.1857	0.903	0.627	1.299	.582
Dysphonia	Age	−0.005	0.0113	0.995	0.973	1.017	.626
	Gender	0.063	0.2988	1.065	0.593	1.913	.833
	Post-extubation	1.447	0.4277	4.250	1.838	9.827	.001*
	Pre-existing neurological disease	−0.037	0.3999	0.964	0.440	2.110	.926
	COVID-19 Neurological manifestation	−0.230	0.3188	0.794	0.425	1.484	.470
	Pre-existing respiratory disease	0.168	0.3253	1.183	0.625	2.239	.605
	Pre-morbid swallow status	−0.266	0.1286	0.767	0.596	0.986	.039
	Cancer diagnosis	0.665	0.4083	1.944	0.873	4.327	.103
	Chest status (as per chest x-ray rating)	0.270	0.1445	1.310	0.987	1.739	.062
Dysarthria	Age	−0.017	0.0122	0.983	0.960	1.007	.172
	Gender	−0.178	0.3349	0.837	0.434	1.613	.837
	Post-extubation	0.061	0.4942	1.063	0.403	2.799	.902
	Pre-existing neurological disease	0.341	0.4126	1.407	0.627	3.158	.408
	COVID-19 Neurological manifestation	**0.822**	**0.3429**	**2.275**	**1.162**	**4.456**	**.017***
	Pre-existing respiratory disease	−0.165	0.3952	0.848	0.391	1.839	.676
	Pre-morbid swallow status	−0.375	0.1439	0.687	0.518	.911	.009
	Cancer diagnosis	0.154	0.4594	1.166	0.474	2.869	.738
	Chest status (as per chest x-ray rating)	−0.024	0.1462	0.977	0.733	1.301	.872

Bold values indicates statistically significant at 0.05 level.

dysphagia at discharge also compares with previous research.[8,21] In one study, dysphagia had fully resolved in 71% of adults with dysphagia at time of discharge based on FOIS scores.[8] This data highlights the need for outpatient SLT services post-discharge to minimize clinical and quality of life complications of dysphagia in this population.

In this study, there was a 20-fold increase in impact on oral intake status for those who had a history of intubation during their inpatient stay. This finding compares with previous post-extubation dysphagia research.[9] There was a three-fold increase in impact on oral intake status for those with neurological manifestations of COVID-19 in this study. Nearly 30% of participants presented with neurological manifestations of COVID-19 in this study. These included stroke, ataxia, and Guillain Barre Syndrome, all of which can compromise swallowing.[4,5] Age was also a predictor of oral intake status, which may be due to sarcopenia, cachexia, and number of co-morbidities among older adults, all of which can compromise deglutition.[31] Awareness of these various risk factors can ensure adults with dysphagia are promptly identified and evaluated to minimize clinical and quality of life complications.

Dysphonia was prevalent at initial SLT assessment in this study. Twenty-three percent had persistent dysphonia at discharge, which was less than the 56% who remained dysphonic at discharge in previous research.[8] History of intubation was a strong predictor of dysphonia in this study; there was a four-fold increase in impact on perceptual voice quality for those with intubation history. This aligns with previous research, which also found a strong link between dysphonia and intubation.[8,11,12]

One-quarter (25%) of adults with COVID-19 in acute care referred to SLT presented with dysarthria. Presence of dysarthria has not been a focus of COVID-19 research to date. While dysarthria resolved for most, 14% remained dysarthric at discharge. Of note, a predictor of dysarthria was neurological manifestations of COVID-19. In fact, the presence of dysarthria may alert multidisciplinary teams to neurological manifestations of COVID-19. Hence, early detection is crucial to minimize complications.

Clinical Implications

The results of this multi-site study indicate that swallowing, voice, and motor speech difficulties present

in adults admitted with COVID-19 across the ROI. Despite this, swallowing and communication difficulties have received little attention as sequalae in COVID-19 research.[32] Given staff shortages and a pressurized healthcare system, awareness of predictors of dysphagia and communication difficulties may assist clinical teams to identify adults who are most at risk and who require prompt evaluation and monitoring during their inpatient stay to minimize longer-term clinical and quality of life complications.

Study Limitations and Future Research

Study limitations include lack of instrumental dysphagia and communication evaluations. Fiberoptic endoscopic evaluation of swallowing and stroboscopy were not available in the early stages of the pandemic due to concerns regarding transmission risk.[23,24] It could be argued that oral intake status is influenced by medical status. Nevertheless, authors suggest that oral intake status may be a more meaningful swallowing outcome measure from the patient perspective. Patient-reported outcomes would have been beneficial but were not feasible given how medically unwell this cohort was. Finally, data on swallowing and communication difficulties post-discharge would inform outpatient service delivery. Data collection from second and third wave is ongoing across the ROI to determine differences in clinical presentations across waves due to factors, including new variant and evolving multidisciplinary management.

CONCLUSION

This study highlights the presence of dysphagia and communication difficulties among adults with COVID-19 admitted into acute care across the ROI. These issues presented both among those who were post-extubation and adults managed on general wards. Predictors of dysphagia, dysphonia, and dysarthria were a combination of pre-existing disease, neurological manifestations, and history of intubation. Awareness of these predictors will promote early in-depth evaluation and monitoring during hospital stay. Prompt SLT evaluation and management are needed to minimize clinical and quality of life complications both within the acute care setting and post-discharge in the community.

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DATA AVAILABILITY STATEMENT

The data that support the findings of this study are available from the corresponding author upon reasonable request.

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