Readmission to secondary care following COVID-19

Authors: M. Holloway*[1]; E. Mitchell[1]; F. Rickard[1]; J. Hesford[1]; K. McCarthy[2]; P. Braude[1]

Affiliations: Department of Geriatric medicine[1] and Surgery[2], Southmead Hospital, North Bristol NHS Trust, UK

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Correspondence*: mhol@doctors.org.uk

Introduction

Healthcare workers have been required to rapidly understand the clinical course of COVID-19, this has created challenges when balancing risk surrounding discharging patients from hospital/secondary care to the community.

Understanding factors that lead to readmission are important to help form robust discharge criteria following a diagnosis of COVID-19.

This team investigated a cohort of patients discharged from hospital following admission with COVID-19. We explored the readmission rate over a 3-month period and the clinical characteristics of those readmitted.

Methods

Design: Observational cohort study. Data were collected as part of the COPE study (COVID-19 in Older People; HRA 20/HRA/1898).

Inclusion criteria: Patients admitted to Southmead Hospital, Bristol between 28th January 2020 – 24th April 2020 with confirmed or clinically diagnosed COVID-19.

Outcomes: Medical records of included patients were prospectively analysed to determine if readmission to Southmead Hospital occurred during the study period (28/1/20—24/4/20). Clinical team readmission diagnosis and patient clinical characteristics were determined.

Results

1. Readmission rate: 141 patients with confirmed or clinically diagnosed COVID-19 were included, nineteen (13.4%) of these patients were readmitted following initial COVID-19 admission.

2. Readmission diagnoses:

- Ten readmissions were attributed to COVID-19 by the clinical team. **See figure 1.**

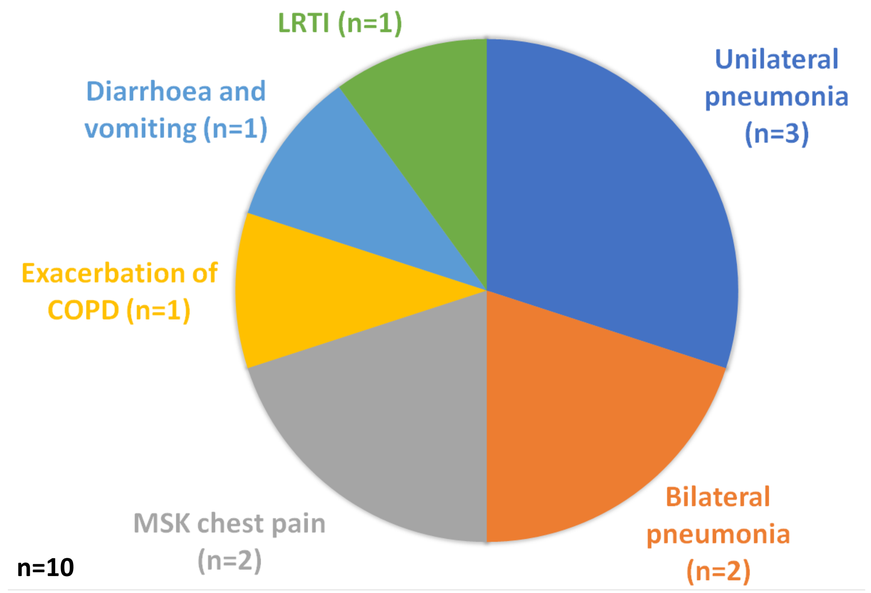

Figure 1: Readmission diagnoses attributed to COVID-19. Abbreviations: Chronic obstructive pulmonary disease (COPD), musculoskeletal (MSK), lower respiratory tract infection (LRTI).

- Nine readmissions were non-COVID-19 attributed by the clinical team. Diagnoses include: thrombotic stroke (n=1), urosepsis (n=2), hospital acquired pneumonia (n=1), decompensated heart failure (n=2), fall (n=1), MSK limb pain (n=1), inadequate social support (n=1).

3. Clinical characteristics of readmissions: See figure 2.

- Median time to readmission was sooner in COVID-19 attributed readmissions compared to non-COVID-19 attributed, 5 (min: 1,max: 23, IQR 6.75) vs. 10 (min: 1, max: 16, IQR 5) days.

	Readmission diagnosis	
	COVID-19 attributed, n=10	**Non-COVID-19 attributed, n=9**
Length of stay (days)	3 (min: 1, max: 33, IQR: 6)	2 (min: 1, max: 45, IQR; 13)
Age (median)	60 (min: 35, max: 87, IQR: 28)	79 (min: 66, max:98, IQR 11)
Sex (male/female)	70% / 30%	66% / 33%
Clinical Frailty Score	3 (min:1, max: 6, IQR: 3)	6 (min: 2, max: 7, IQR: 2)
Active smoking	60% (6)	44% (4)
Chronic lung disease	30% (3)	22% (2)
Heart failure	10% (1)	33% (3)
Ischaemic heart disease	20% (2)	44% (4)
Diabetes	40% (4)	66% (6)
Hypertension	40% (4)	77% (7)
Chronic Kidney Disease	50% (5)	100% (9)

Figure 2: Clinical characteristics of readmitted patients.

4. Readmission length of stay (LOS) in COVID-19 attributed readmissions:

- Five COVID-19 attributed readmissions had a LOS > 1 day (median LOS 7 days, min: 4, max: 33, IQR:1), with one patient dying—all were male. The remaining five COVID-19 attributed admissions had a LOS <1 day.

- There was a higher proportion of diabetes in the COVID-19 attributed readmissions with a LOS >1 day, 80% vs. 0%.

- Clinical Frailty Score (CFS) was comparable between COVID-19 attributed readmissions with a LOS >1 day vs. LOS <1 day, median CFS 4 (min: 2, max: 6, IQR: 3) vs. 3 (min: 1, Max: 6, IQR: 1).

Discussion

Our cohort had a readmission rate of 13.4%, this is similar to secondary care readmission rates in England between 2017/18[1]. The majority of patients with COVID-19 attributable readmissions represented to hospital 5 days following discharge; this is consistent with the literature[2].
Furthermore, in keeping with our current knowledge of the COVID-19 illness trajectory, patients who suffer acute infection syndrome tend to become unwell around 10 days after initial symptom onset[3].

A majority of COVID-19 attributed readmissions comprised of respiratory problems. Half of COVID-19 attributed readmissions had a length of stay greater than 1 day; this group was male predominant and had a high prevalence of diabetes. These risk factors may be beneficial in risk prediction tools when making individualised decisions regarding hospital discharge, however further work with a larger sample size is required to develop these tools.

This study has improved our understanding of factors associated with increased risk of hospital readmission in COVID-19, this will allow healthcare workers to focus education, training and resources to better manage these patients both in a hospital and community-based setting.

References

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3. Chen, J. et al (2020). Clinical progression of patients with COVID-19 in Shanghai, China. *The Journal of infection*, *80*(5), e1–e6.