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LETTER

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What is the effect of lockdown upon hospitalisation because of COVID-19 amongst patients from a heart failure registry?

To the Editor

Coronavirus disease 2019 (COVID-19) is associated with mortality risk in heart failure (HF) patients.[1] In order to curb the spread of the virus, the UK government announced a national lockdown in March 2020. Whilst there is data[2-6] regarding the prognosis of HF patients hospitalised with COVID-19, the impact of lockdown upon in incidence of hospitalisation, is unknown.

Our single centre, retrospective observational study was undertaken in a British university hospital to analyse the effect of lockdown upon COVID-19 hospitalisations amongst HF patients and the predictors of risk. We collated data regarding co-morbidities (Charlson Co-morbidity Index- CCI),[7] the Rockwood clinical frailty score (CFS), clinical features, blood results, HF treatments and 30-day mortality.

TABLE 1 Comparison of HF patient characteristics (COVID vs no-COVID)

Baseline characteristics	HF with COVID (n = 50)	HF without COVID (n = 751)	*P*
Age	75.3 ± 10	73 ± 14.1	NS
Female	40%	46%	.4
DM	27/50 74%	225/751 30%	<.001
HTN	41/50 82%	466/751 40%	.005
IHD	29/50 58%	301/751 40%	.01
COPD	11/50 22%	233/751 31%	.18
CKD	27/50 54%	370/751 (49%)	.52
AF	25/50 50%	413/701	.2
Charlson Age adjusted Comorbidity Index	6.5 ± 1.5	6.1 ± 1.1	.01
Rockwood Frailty Index	5.8 ± 1.9	5.1 ± 1.7	.005
Beta blocker	78%	653/751	.15
Mineralocorticoid antagonist	28%	262/751	.43
ACE/ARB/ARNI	65%	81%	.05
Device therapy	7%	60/751	.95
Average length of stay	15.6 (±14.8) Median 14.5 (3-57)	8.6 8 (1-43)	<.01
HFpEF	36%	32%	.92
BMI	33.67 (±9.1)	31.1 ± 8.1	.04
NTpro-BNP	6242 (415-24 000)	3564 (515-7000)	.07
Hb	118.5 ± 19.2	119 ± 20.5	.83
Urea	6.9 ± 3.9	8 ± 4	.2
Creatinine	154 ± 71	128 ± 69	.05
Sodium	136 ± 5.3	139 + 4.5	<.001
GWTG	43 ± 7.1	38.8 ± 6.4	<.001

Note: Demographic data and background of patients admitted with COVID vs no-COVID $P < .05$ is taken to mean statistical significance.

Abbreviations: ACEI, Angiotensin heart receptor enzyme inhibitor; AF, Atrial fibrillation; ARB, Angiotensin receptor blocker; ARNI, angiotensin receptor-neprilysin inhibitor; BMI, Body mass index; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; GWTG, Get with the guidelines risk score; HF, Heart failure; HFpEF, heart failure with preserved ejection fraction; HTN, hypertension; IHD, ischemic heart disease.

TABLE 2 Comparison of characteristics of HF patients hospitalised with COVID (dead vs alive)

Baseline characteristics	Dead (n = 2750 = 54%)	Alive (23/50 = 46%)	*P*
Age	77.8 ± 8.9	73.9 ± 10.1	.2
Female			
DM	21/6	11/12	.03
HTN	21/27	12/23	.06
IHD	15/12	10/13	.4
COPD	7/27	4/23	.5
CKD	15/27	12/23	.81
AF	14/27	11/23	.37
Charlson Age adjusted Comorbidity Index	6.5 ± 1.6	5.9 ± 1.3	.15
Rockwood Frailty Index	6.2 ± 1	5.4 ± 1	.006
Beta blocker	71%	80%	.22
Mineralocorticoid antagonist	31%	24%	.45
ACE inhibitor	61%	71%	.18
HFrEF			.9
BMI	33.6 ± 8	31.8 ± 7.5	.4
NTpro-BNP	6807(1810- 24 305)	5700 (1653-17000)	.91
Hb	121 ± 20	115 ± 18	.33
Lymphocyte count	1 ± 0.4	1.1 ± 0.5	.5
BUN	6.9 ± 4	6.7 ± 3.5	.9
Creatinine	153 ± 98	150 ± 65	.9
Sodium	134.3 ± 5.9	136.7 ± 4.3	.42
BP	134 ± 29	146 ± 32	.17
HR	88 ± 20	78 ± 19	.2

Note: Comparison of HF patient characteristics (dead vs alive).

Abbreviations: ACE, Angiotensin receptor enzyme; AF, Atrial fibrillation; BMI, Body mass index; BUN, blood urea nitrogen; CKD, chronic kidney disease; COPD, chronic obstructive pulmonary disease; DM, diabetes mellitus; Hb, haemoglobin; HFrEF, heart failure with reduced ejection fraction; HTN, hypertension; IHD, ischemic heart disease.

We identified 1097 HF patients from our existing HF registry with HF hospitalisation in 2018 and 2019. Fifty out of 801 (6.2%) surviving HF patients required hospitalisation because of COVID-19 from March to November 2020 (COVID group); 24 patients (3.1%) during the first lockdown (March-June 2020) and 26 (3.5%) in the post-lockdown period (July-November 2020); $P = .7$. In comparison to patients not hospitalised with COVID-19 (no-COVID group), the COVID group had a significantly higher prevalence of co-morbidities (Table 1) – hypertension ($P < .001$), diabetes ($P = .005$), ischaemic heart disease ($P = .01$) and increased body mass index ($P = .04$). This data is in line with other studies.[1,4,8,9] CCI was also significantly higher in the COVID group (6.5 ± 1.5 vs no-COVID group 5.7 ± 1; $P < .001$). The COVID group was frailer (Rockwood CFS in COVID group 6.5 ± 1.5 vs. 6.1 ± 1.1 in no-COVID group; $P = .02$). HF patients hospitalised with COVID had a longer hospital stay than for HF (median 14.5 days vs 8 days; $P < .001$) and 30-day mortality was 52%.

Table 2 illustrates mortality predictors. Whilst the incidence of diabetes, hypertension and frailty was significantly higher amongst the group that died within 30 days, multivariate regression analysis demonstrated that only diabetes (OR 3.82;95% CI 1.13 to 12.95; $P = .03$) and Rockwood Frailty Score ≥6 (OR 6.5306; 95% CI: 1.8958 to 22.4961; $P = .003$), were independent predictors of mortality.

Our study showed a similar incidence of COVID-19 hospitalisation pre- and post-lockdown amongst HF patients. This is the first study of its kind and demonstrates some important results. Mainly that the incidence of HF COVID-19 hospitalisation was 3.1%, this was similar to the overall incidence during the first wave in England (3.5%).[10] It can only be surmised that HF patients have been taking adequate shielding precautions in view of media reports of higher risk of complications amongst patients with cardiovascular co-morbidities. It is also possible that the anxiety felt by HF patients and their reluctance to attend hospital may also have resulted in reduced hospitalisations because of COVID-19.[11] 30-day mortality because of COVID-19 hospitalisation was high (54%) in our HF cohort, comparable to other studies.[4,8,9]

Study limitations include the single centre, retrospective observational design and relatively small number of COVID-19 hospitalisations in this cohort.

In conclusion, our data suggest that lockdown did not seemingly affect the incidence of amongst patients from our HF registry.

Co-morbidity and frailty scores should be incorporated during the initial clinical assessment to aid risk prediction for 30-day mortality.

DISCLOSURE

The authors declared no conflict of interest.

DATA AVAILABILITY STATEMENT

The datasets generated during and/or analysed during the current study are available from the corresponding author on reasonable request.

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