

Impact of lockdown on patients with congestive heart failure during the coronavirus disease 2019 pandemic

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Abstract

Aims Cardiovascular co-morbidities like congestive heart failure (CHF) alter the course of coronavirus disease 2019. Factors associated with the outbreak and lockdown can exacerbate CHF.

Methods and results We analysed the answers of 124 randomly selected CHF outpatients (mean age 71.0 ± 14.0 years, 60.5% male) interviewed by phone during the sixth and seventh weeks of the lockdown. Most patients were treated for New York Heart Association class II (38.7%) and reduced ejection fraction HF (70.2%). Psychological distress (Kessler 6 score ≥ 5) was common (18.5%), and 21.8% felt worse than before the lockdown. Few patients ($n = 10$) adjusted their intake of HF medications, always on medical prescription. Decreased physical activity was common (41.9%) and more frequent in women ($P = 0.025$) and urban dwellers ($P = 0.009$). Almost half of respondents (46.0%) declared increased screen time, but only few declared more alcohol intake (4.0%). Weight gain was common (27.4%), and 44.4% of current smokers increased tobacco consumption. Adherence to recommended salt or fluid intake restrictions was reduced in 14.5%. Increase in HF symptoms was commonly reported (21.8%) and tended to be higher in women than in men ($P = 0.074$). Of the 23 patients who had a phone teleconsultation during the pandemic, 16 had initially planned an in-person consultation that they switched for teleconsultation.

Conclusions During the lockdown, psychological distress and decreased well-being were common in CHF outpatients, and there was an increase in unhealthy lifestyle behaviours. These changes may negatively impact short-term and long-term prognoses. Medication adherence was maintained, and limitations in access to care were partly counterbalanced by use of telehealth.

Keywords Heart failure; Lockdown; COVID-19; Health behaviour; Lifestyle; Medication adherence

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Introduction

Cardiovascular co-morbidities, such as congestive heart failure (CHF), dramatically alter the prognosis of coronavirus disease 2019 (COVID-19).¹ The outbreak of COVID-19 and the resulting lockdown have been generally associated with social and physical isolation, psychological distress, limited access to care, decreased medication adherence, and the adoption of unhealthy lifestyle behaviours. However, patients with chronic diseases may be particularly affected by the specific stress caused by the pandemic. In CHF patients, psychological

distress may lead to destabilizations through stress-related sympathetic activation.^{2–5} This distress, which is encouraged by social isolation, is often associated with unhealthy behaviours including decreased physical activity, unhealthy dietary intake, decreased treatment adherence, and substance consumption. Alcohol consumption may have a toxic effect on myocardial function and can cause life-threatening arrhythmias. Moreover, some media messages have suggested the protective effect of tobacco and the deleterious effect of taking selective serotonin reuptake inhibitors, which may have influenced tobacco-related behaviours and medication

adherence.^{1,6} Limitations in access to care may impair the management of CHF while negatively influencing lifestyle behaviours, diet, and medication adherence, which are the foundations of CHF management.⁷ However, these limitations could be offset by telemedicine, potentially preventing CHF destabilization by providing timely lifestyle counselling and treatment adjustments. It has recently been underlined that telehealth is underused in CHF patients in spite of the recommendations.^{8,9} It is currently unknown if the limitations in access to care caused by the lockdown may facilitate such interventions.

Aims

We aimed to evaluate the impact of the COVID-19 outbreak and lockdown on health indicators and behaviours among a cohort of outpatients with CHF.

Methods

During the sixth and seventh weeks of lockdown (which started 17 March 2020), 150 randomly selected CHF patients from the Dijon University Hospital Heart Failure Clinic cohort (45.0%) were invited to answer an anonymous questionnaire. This questionnaire was previously tested on 10 subjects (members of our research unit) as an internal procedure in order to assess compliance (understanding, coherence, and reliability), leading to changes in the questions regarding medications and tobacco consumption. Then the questionnaire was tested by phone on eight HF outpatients who were not managed in our clinic (external procedure), and no changes were found to be necessary. The 20 min phone interview was conducted by one of eight trained research assistants. Psychological distress was defined as a Kessler 6 score (K6) ≥ 5 .¹⁰ CHF data were extracted from patient medical files. Informed consent was orally obtained before starting the questionnaire, with clinical trial recording number NCT04390126.

Continuous variables were expressed as medians and inter-quartile ranges (IQRs) or means \pm standard deviation (SD). Student's *t*-tests or Mann–Whitney tests were used to compare continuous variables and Fisher's tests to compare dichotomous data, as appropriate.

Results

Most patients answered the survey [$n = 124/150$ (82.7%)], and responses were unavailable for only 26 patients (11 were lost to follow-up, 8 were deceased, 2 declined, 2 had cognitive impairment, 2 were not fluent in French, and 1 was

hospitalized for cardiac electrical storm). Patient characteristics are summarized in *Table 1*. The respondents were mostly men (60.5%), had mean age 71.0 ± 14.0 years, were living in urban zones, were suffering from dilated or ischaemic cardiomyopathies, and had New York Heart Association NYHA Class II HF and reduced ejection fraction (EF). Women were 6 years older than men.

Almost all patients (120, 96.8%) claimed that they complied with the nationwide lockdown policies. More than one fifth ($n = 27$), and even commonly women, felt worse than before the lockdown. The median K6 score was 2 (IQR: 0–3). Approximately 10% said there had been changes to their HF medications, but all of the changes were the result of a medical prescription. No patients had encountered difficulty obtaining their medication during the lockdown. A decrease in physical activity was common (41.9%), was more frequent in women ($P = 0.025$), and was reported almost twice as often in urban as in rural populations (50.0 vs. 26.2%, $P = 0.009$). Only nine (7.3%) declared a replacement PA. Almost half declared increased screen time, although not significantly more in urban vs. rural areas (50.0 vs. 38.1, $P = 0.25$). Only 4% of respondents had increased their alcohol intake. Half of current smokers had increased their tobacco consumption. Only 7.3% of respondents had reduced their adherence to salt intake recommendations, and 11.3% had increased their fluid intake. Body weight increase was common (27.4%). An increase in HF symptoms (i.e. dyspnoea, inferior limb oedema, or fatigue), suggestive of HF destabilizations, was commonly reported (21.8%). The increase in symptoms tended to be more common in women than in men ($P = 0.074$) and was associated with increased diuretic use in seven patients. At some point during lockdown, 16.1% of patients had a medical examination. Among the 23 patients who attended a phone teleconsultation, 16 had initially planned to attend an in-person physical examination but switched to a phone teleconsultation in view of the circumstances.

Conclusions

Our data showed significant impairment of well-being, which was probably related to both psychological distress and exacerbation of symptoms suggestive of HF destabilization. In addition, the negative effects of the current pandemic are likely to be long-lasting, as suggested by our interviews, which were carried out more than 5 weeks after the beginning of the lockdown.

A number of our CHF patients admitted that they had developed unhealthy behaviours, such as increased cigarette consumption and reduced physical activity (>40% of patients). Interestingly, those living in rural area were less likely to decrease their physical activity, which is potentially

Table 1 Patients characteristics and main findings (n (%), mean ± SD)

	Total n = 124	Men n = 75	Women n = 49	P
Demographics				
Age, years	71.0 ± 14.0	68.9 ± 13.7	74.3 ± 14.0	0.03
BMI, kg/m ²	28.2 ± 5.4	28.3 ± 5.3	28.1 ± 5.7	0.89
Type of residence				0.84
Urban (≥2000 inhabitants)	82 (66.1)	49 (65.3)	33 (67.3)	
Rural (<2000 inhabitants)	42 (33.9)	26 (34.7)	16 (32.7)	
HF categories				
HFrEF	87 (70.2)	62 (82.7)	25 (51.0)	<0.001
Including HFrEF with normalized EF	26 (21.0)	17 (22.7)	9 (18.4)	0.65
HFmrEF	12 (9.7)	7 (9.3)	5 (10.2)	1
HFpEF	25 (20.2)	7 (9.3)	18 (36.7)	<0.001
Aetiology				
Dilated cardiomyopathy	50 (40.3)	37 (49.3)	13 (26.5)	0.02
Ischaemic	23 (18.5)	18 (24.0)	5 (10.2)	0.06
Valvular	13 (10.5)	8 (10.7)	5 (10.2)	1
Hypertensive	10 (8.1)	0 (0)	10 (20.4)	<0.001
Hypertrophic cardiomyopathy	9 (7.3)	1 (1.3)	8 (16.3)	<0.001
Amyloidosis	7 (5.6)	6 (8.0)	1 (2.0)	0.24
Toxic	3 (2.4)	1 (1.3)	2 (4.1)	0.56
Other	9 (7.3)	4 (5.3)	5 (10.2)	0.32
HF characteristics				
Current NYHA class				
I	39 (31.5)	29 (38.7)	10 (20.4)	<0.05
II	48 (38.7)	29 (38.7)	19 (38.8)	1
III	28 (22.6)	14 (19.7)	14 (28.6)	0.27
IV	9 (7.3)	3 (4.0)	6 (12.2)	0.15
History of NYHA class				
III	52 (41.9)	34 (45.3)	18 (36.7)	0.36
IV	42 (33.9)	28 (37.3)	14 (28.6)	0.34
HF management				
Cardiac resynchronization therapy	31 (25.0)	21 (28.0)	10 (20.4)	0.40
Implantable cardioverter-defibrillator	46 (37.1)	33 (44.0)	13 (26.5)	0.06
Telemonitoring ^a	28 (22.6)	18 (24.0)	10 (20.4)	0.67
Symptoms and health factor variations				
Increase in dyspnoea	10 (8.1)	4 (5.3)	6 (12.2)	0.19
Increase in oedema	10 (8.1)	4 (5.3)	6 (12.2)	0.19
Increase in fatigue	16 (12.9)	8 (10.7)	8 (16.3)	0.42
Increase in dyspnoea or oedema or fatigue	27 (21.8)	13 (17.3)	14 (28.6)	0.07
Decrease in well-being	27 (21.8)	12 (16.0)	15 (30.6)	0.07
Psychological distress ^b	23 (18.5)	15 (20.0)	8 (16.3)	0.64
Weight gain > 2 kg	34 (27.4)	22 (29.3)	12 (24.5)	0.68
Health care access				
Medical examination	20 (16.1)	10 (13.3)	10 (20.4)	0.33
Planned appointments	68 (54.8)	42 (56.0)	26 (53.1)	0.85
Cancelled appointment ^c	49 (72.1)	32 (76.2)	17 (65.4)	0.41
Switch for teleconsultation ^d	16 (32.7)	11 (34.4)	5 (29.4)	1
Teleconsultation (total)	23 (18.5)	14 (18.7)	9 (18.4)	1
HF medication modifications^e				
Increase	9 (7.3)	6 (8.0)	3 (6.1)	1
Decrease	3 (2.4)	3 (4.0)	0 (0)	0.27
Increase or decrease	12 (9.7)	9 (12.0)	3 (6.1)	0.36
Lifestyle and behaviours				
Decrease in physical activity	52 (41.9)	25 (33.3)	27 (55.1)	0.025
Increase in screen time	57 (46.0)	31 (41.3)	26 (53.1)	0.27
Current smokers	9 (7.3)	7 (9.3)	2 (4.1)	0.48
Increase in cigarette consumption	4 (44.4)	3 (42.9)	1 (50.0)	1
Increase in alcohol intake	5 (4.0)	4 (5.3)	1 (2.0)	0.65
Decrease in dietary adherence ^f	18 (14.5)	12 (16.0)	6 (12.2)	0.61

EF, ejection fraction; HF, heart failure; HFmrEF, heart failure with mid-range ejection fraction; HFpEF, heart failure with preserved ejection fraction; HFrEF, heart failure with reduced ejection fraction; NYHA, New York Heart Association.

^aFor patients with implantable cardioverter-defibrillator or cardiac stimulator.

^bK6 score ≥ 5.

^c% of planned appointments.

^d% of cancelled appointments.

^eDiuretic or angiotensin-converting enzyme inhibitors or angiotensin-receptor blocker or angiotensin receptor neprilysin inhibitor or beta-blocker.

^fSalt and/or fluid restrictions.

explained by easier access to an environment conducive to exercise. The rate of subjects who declared increase in alcohol intake was low (5%), and more patients reported a decreased intake (15%). These findings could be partly explained by lack of access to bars and reduced social drinking with friends or family. Interestingly, one out of seven patients admitted poorer adherence to salt and/or fluid intake restrictions. In CHF patients, adherence to dietary advice is a key issue that is often a challenge even in a normal context.¹¹

Surprisingly, despite potentially alarming media messages, medication adherence was not diminished. We documented a significant reduction in health care access, and a number of patients delayed or even cancelled planned physician examinations. At the same time, a significant number of patients (~20%) switched from an in-person consultation to telemedicine after the initiation of the lockdown.

In conclusion, lockdown policies and medication adherence appear to be upheld by CHF outpatients for the most part. However, our data reveal deteriorations in well-being and cardiovascular health indexes, associated with an increase in unhealthy lifestyle behaviours. Beyond the short term, these changes could profoundly affect disease severity. However, lockdown-related barriers to health care access were partly compensated by an encouraging increase in telehealth use. Our findings suggest that the COVID-19-related outbreak could act as an accelerator of telehealth implementation, which is a resource-efficient strategy in the management of CHF patients.

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Conflict of interest

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