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Role of Telemedicine in Improving Guideline-Directed Medical Treatment for Patients with Heart Failure During a Pandemic



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KEYWORDS

• Telehealth • Heart failure • Guideline medications • COVID-19

KEY POINTS

- Telehealth and heart failure
- Heart failure and COVID-19
- Heart failure guidelines
- Adherence to heart failure treatment guidelines

The coronavirus disease 2019 (COVID-19) pandemic has complicated the management of heart failure (HF), which is by itself an intricate disease to treat. Decreased medical contact, reduced social interactions, and lockdowns during this global pandemic are a few of the many factors that have made treating this medically fragile population more complex. In addition, parallels between COVID-19 infection and resulting myocardial injury have been suggested, which may further impair cardiac function and increase exacerbations.¹ Finding innovative strategies to successfully treat patients with HF while keeping them safe from COVID-19 exposure is an unavoidable challenge many providers face while battling this complex virus.

DISCUSSION

Current guideline-directed medical treatment (GDMT) for patients with HF includes the use of Entresto, an angiotensin receptor-neprilysin inhibitor (ARNI), a β -blocker (Metoprolol Succinate, Carvedilol, or Bisoprolol), an aldosterone antagonist (AA), and a sodium-glucose cotransport-2 inhibitor (SGLT-2). This regimen is complex for the

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Abbreviations	
COVID-19	coronavirus disease 2019
GDMT	guideline-directed medical treatment
ARNI	Angiotensin receptor-neprilysin inhibitor
B-Blocker	Beta blocker
AA	Aldosterone antagonist
SGLT-2	Sodium-glucose cotransport-2 inhibitor
HF	Heart failure
HFrEF	Heart failure with a reduced ejection fraction
EF	Ejection fraction

patient and provider alike. Patients with HF struggle with polypharmacy and providers battle multiple comorbidities that complicate the initiation and titration of many of the guideline-directed medications. Add in a global pandemic and achieving target or optimal doses of these medications seems like an insurmountable feat.

COVID-19 and Chronic HF

Chronic comorbidities increase the risk of severe COVID-19 and experience a worse prognosis and a mortality rate of over 10%.² Viral infections such as coronaviruses and influenza have been shown to exacerbate preexisting HF and increase HF-related hospitalizations. Severe COVID-19 infections necessitate increased cardiac performance and high cardiac output, something that patients with HF are mostly unable to produce. According to Bader and colleagues,² established HF is an independent predictor of in-hospital death for COVID-19-infected patients.

Comorbidities

More than half of all patients with HF are diagnosed with 5 or more comorbid conditions, which compound the risk of all-cause and HF hospitalizations. The most common comorbidities found in patients with HF are hypertension (85.6%), ischemic heart disease (72.1%), hyperlipidemia (62.6%), anemia (51.2%), diabetes mellitus (47.1%), arthritis (45.6%), chronic renal insufficiency (CRI; 44.8%), chronic airway diseases (30.9%), and atrial fibrillation (28.8%).³ CRI is the largest predictor of HF outcome outside left ventricular ejection fraction. Optimal dosing of guideline-directed medications, especially renin-aldosterone-angiotensin blockers, becomes problematic when the glomerular filtration rate is low. Chronic obstructive pulmonary disease (COPD) affects one-third of all patients with HF and predicts mortality. This comorbid condition often goes undiagnosed due to dyspnea, a common finding in patients with HF, being the most frequently reported complaint. There is an underutilization of β -blockers and increased usage of steroids, which increase fluid retention in the COPD population.³

Polypharmacy

Owing to the sizable percentage of patients with HF with multiple comorbid conditions, polypharmacy, which is needing to take 5 or more medications daily, is common. Polypharmacy is associated with disability, decreased functional status, and higher incidence of drug-drug interaction effects.⁴ The complex medication regimen currently recommended to reduce HF mortality consists of at least 6 medications dosed up to 3 times daily. Combine that with medications used to manage other comorbid conditions, and the result is an overwhelming daily routine that patients struggle to maintain.

Telemedicine and HF

Telemedicine, the practice of delivering health care at a distance using telecommunications technologies, has increased in response to the COVID-19 pandemic. Telemedicine can safely decrease HF hospitalizations, mortality, and risk of exposure to COVID-19.⁵ The Heart Failure Society of America released a statement in favor of establishing virtual visits for patients with HF to ensure that the risk of COVID-19 infection is decreased while continuing to provide proper and safe follow-up for this cohort. Bader and colleagues reported that the use of telemedicine produced a decrease in the percentage of no-show visits for hospital follow-up visits 7 days after discharge (51% no-show for in-person vs 34.6% for virtual visits). Limited assessment of clinical volume overload (edema or jugular venous distension) paired with recording of daily weights, vitals, and activity tolerance can also aid in assessing symptoms and guide any medication changes. Telemedicine allows patients with chronic HF to have access to care while decreasing the risk of exposure and further spread of the virus (Fig. 1).

Telemedicine and GDMT

A systematic review by Yun and colleagues⁵ reported that telemonitoring patients with HF produces a 19% decrease in all-cause mortality but no change in the rate of hospitalization. Medication adherence and early symptom management were the most-reported reasons for the significant reduction in mortality. A randomized controlled trial by Comin-Colet and colleagues⁶ demonstrated that HF management using telehealth increased treatment adherence among patients, decreased rehospitalizations, and lowered health-related costs. Blood and colleagues⁷ stated that remote monitoring via telehealth with or without video of patients with HF_{rEF} for uptitration of GDMT medications is feasible and cost-effective, given the titration program has specific algorithms for titration and are collaborative between a physician, a pharmacist, and an HF nurse.

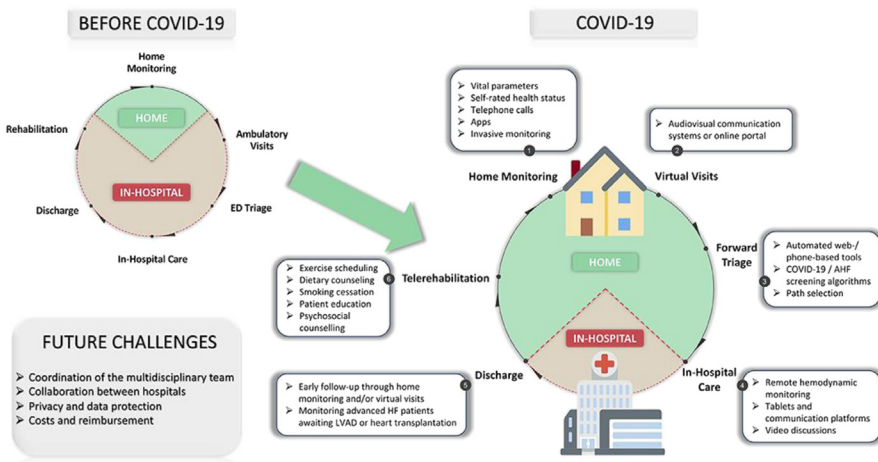


Fig. 1. Telemedicine in patients with heart failure before and during COVID-19. (From Tersalvi G, Winterton D, Cioffi GM, Ghidini S, Roberto M, Biasco L, Pedrazzini G, Dauw J, Ameri P and Vicenzi M (2020) Telemedicine in Heart Failure During COVID-19: A Step Into the Future. *Front. Cardiovasc. Med.* <https://www.frontiersin.org/articles/10.3389/fcvm.2020.612818/full>. Published December 2020. Accessed 10/01/2021.)

Implementation of Telemedicine During COVID-19

Telehealth is not new to health care providers; it was first used in the 1950s when several hospitals shared images and information via telephone.⁸ Before the outbreak of COVID-19, most health systems in the United States had low rates of telehealth use for ambulatory patient care. Many health care facilities have increased telehealth visits from less than 100 per day before the pandemic to more than 1000 visits per day currently (Fig. 2). Evidence on the use of telehealth for HF management is sparse and controversial because of the underutilization of telehealth until very recently.⁹ Although current findings support the use of telehealth for adults with HF, a meta-analysis by Zhu and colleagues¹⁰ suggests that further research is needed to confirm these results.

Hernandez¹¹ discovered through a retrospective chart review that telehealth was successful in increasing the number of patients with HF with appropriate GDMT medications and decreasing HF hospitalizations. The findings also highlighted opportunities for education about the GDMT medications and their appropriate use. The results of this project also provided evidence that it is possible to initiate these medications despite comorbidities. Her¹¹ review found a 5% increase in patients on appropriate GDMT medications, and this is consistent with the current evidence regarding chronic illness management using telehealth. A systematic review by Kruse and colleagues¹² found that using telehealth for cardiovascular disease management reduced hospital admissions and readmissions but failed to find statistical significance from any of the included articles. Greenhalgh and colleagues¹³ found through their systematic review that telehealth was superior in disease-modifying medication titration to higher, more effective doses as compared with standard care.

Telehealth can be used to manage the full spectrum of patients with HF, including those with reduced EF, preserved EF, and across all stages (A-D). The visits can manage new or worsening symptoms of HF, medication titration, hospital discharge follow-up, and new test results. Health care workers represent 20% of COVID-19

Before COVID-19:

18%

of doctors delivered virtual care

After COVID-19:

48%

of doctors are delivering virtual care

Fig. 2. Rapid adoption in response to COVID-19. (From Ed Lee, MD, MPH. How COVID-19 created a telehealth surge. Kaiser Permanente Business. <https://business.kaiserpermanente.org/insights/telehealth/covid-19-accelerated-telehealth>. Published July 28, 2020. Accessed 10/01/2021.)

cases, and telehealth allows providers who require quarantine but remain well to continue to manage patients.¹⁴ Patients with HF experience many barriers to attending in-person visits, including poor exercise tolerance, difficulty in transporting oxygen, and lack of transportation. Telehealth removes these hurdles, and many believe it will become the norm after the COVID-19 crisis.¹⁴

SUMMARY

The use of GDMT for improving HFrEF outcomes is well supported by current practice guidelines and evidence. However, recent literature shows that adherence to the guidelines for HFrEF treatment remains low for the provider and patient. Telehealth removes barriers to care for patients with HF and has demonstrated lower hospitalization rates and increased patient satisfaction. Treatment adherence is increased when telehealth is used, and this leads to better success with GDMT titration. Owing to the COVID-19 pandemic, many health care systems quickly implemented telehealth to continue to manage the HF population while reducing potential COVID-19 exposure. GDMT utilization will increase, and hospitalizations will decrease with the use of telehealth despite COVID-19.

CLINICS CARE POINTS

- Telehealth allows providers who require quarantine but remain well to continue to manage patients.¹⁴
- Patients with HF experience many barriers to attending in-person visits, including poor exercise tolerance, difficulty in transporting oxygen, and lack of transportation, and telehealth removes these hurdles.¹⁴
- A systematic review by Zhu and colleagues¹⁰ reported that telemonitoring patients with HF produces a 19% decrease in all-cause mortality but no change in the rate of hospitalization
- Telemedicine safely reduces health care use by reducing emergency room visits.¹⁰
- Telemedicine medication titrations are just as successful as traditional, in-person titrations.¹⁰

DISCLOSURE

The author has nothing to disclose.

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