

Heart failure and palliative care in the emergency department

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ABSTRACT

Objectives Heart failure is a common ED presentation that is underserved by palliative care services and is associated with significant morbidity and mortality. We sought to evaluate use of palliative care services in patients with heart failure presenting to the ED. The primary outcome studied was palliative care involvement. Secondary outcomes of the study were: (1) 1-year mortality, (2) ED visits, (3) hospital admissions and (4) heart failure clinic involvement.

Methods We conducted a health records review of 500 patients with heart failure who presented to two Canadian academic hospital EDs from January to August 2013.

Results Patients were of mean age 80.7 years, women (53.2%) and had significant comorbidities. Only 41% of all deceased patients at 1 year had any palliative care involvement. Of those with palliative care, 44 (76%) patients had less than 2 weeks of palliative care involvement prior to death. Compared with those with no palliative care, the 79 (15.8%) patients with palliative care involvement had a higher 1-year mortality rate (70.9% vs 18.8%) and more hospital admissions/year (1.4 vs 0.85) for heart failure.

Conclusions We found that few patients with heart failure had palliative care services. Additionally, the majority of those who have palliative care involvement do not meet current recommendations for early palliative care involvement in heart failure. This study suggests that the ED may be an appropriate setting to identify and refer high-risk patients with heart failure who could benefit from earlier palliative care involvement.

INTRODUCTION

Background

Heart failure is a disease with increasing prevalence, associated with significant morbidity and mortality.¹ Palliative care has been well studied in the realm of malignant illnesses and multiple studies have shown improved quality of life and decreased hospital utilisation.^{2,3} That being said, palliative care is thought to be underused by patients with non-malignant terminal illnesses.^{4,5} In 2011, the Canadian Cardiovascular Society (CCS) Heart Failure Management Guidelines Update emphasised the growing need for early and comprehensive palliative care for patients with heart failure, not simply those deemed at the 'end of life'.⁶

Goals of this investigation

Our goal was to evaluate the use of palliative care in patients with heart failure who presented to academic centre EDs. Our primary objective was to

Key messages

What is already known on this subject

- ▶ Heart failure is a chronic disease with significant morbidity and mortality. The literature has shown that these patients have high levels of symptom burden, including dyspnoea, depression, pain and fatigue. This burden translates to increased utilisation of the ED.
- ▶ Palliative care has been shown to improve quality of life in both malignancy as well as non-malignancy-related terminal illnesses such as heart failure.
- ▶ Palliative care is underused by patients with non-malignancy-related terminal illnesses. Current guideline recommendations for 'early palliative care involvement' in heart failure.

What this study adds

- ▶ In this retrospective observational study of two academic EDs in Canada, we evaluated the extent of palliative care involvement in patients with heart failure presenting to the ED, their associated healthcare utilisation and 1-year mortality.
- ▶ Patients with heart failure over the age of 65 who present to the ED have a high 1-year mortality (27%) but have a low palliative care involvement (15.8%).
- ▶ Of those patients with heart failure referred to palliative care, the majority (76%) died within 2 weeks of involvement.
- ▶ There is a significant need for methodologically sound referral criteria that can identify high-risk patients with heart failure from the ED who could benefit from palliative care involvement.

determine the extent of palliative care involvement in patients with heart failure who present to the ED, both in absolute prevalence as well as timing of involvement before death. Secondary objectives were (1) 1-year mortality, (2) ED visits, (3) hospital admissions and (4) heart failure clinic involvement.

METHODS

Study design and setting

We performed a health records review of 500 consecutive, unique patients with heart failure who presented to the ED between January and August 2013. The patient encounters were from the EDs of two tertiary care academic hospitals in Ottawa, Ontario, Canada.



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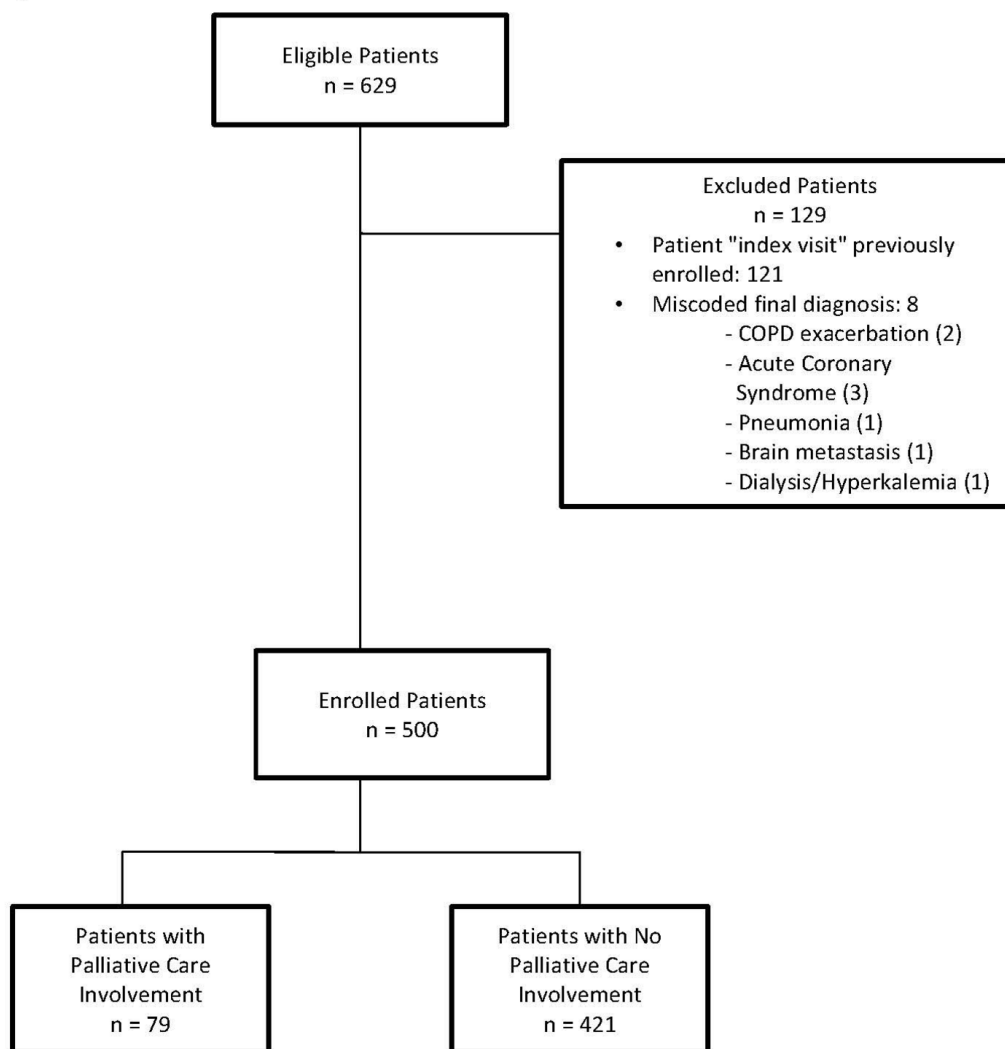


Figure 1 Patients enrolled in the health records review. COPD, chronic obstructive pulmonary disease.

Population

All patients reviewed were seen in the ED. Inclusion criteria were all patients aged 65 years and older with a diagnosis of heart failure exacerbation by the emergency physician (International Classification of Diseases-10 code 150). The first ED visit identified during enrolment was labelled as the index case and was used for analysis. Exclusion criteria can be seen in [figure 1](#).

Data collection

The chart index case was manually reviewed for patient characteristics and medications. The chart was also reviewed for any consultations with palliative care or the University of Ottawa Heart Institute (UOHI) Heart Failure Clinic. A 1-year follow-up was performed for each patient via the hospital electronic health records system. All data were entered into a secured Excel database.

Outcome measures

The primary outcome measured was palliative care involvement in patients with heart failure who present to the ED. This was determined through review of the electronic medical records (EMR) for any palliative care consultation or cardiology consult referencing active palliative care involvement. In this study group, palliative care was provided either through the inpatient

palliative care service which would provide recommendations on symptom management as well as facilitate goals of care discussions and end-of-life care throughout the patients' admission or through various outpatient palliative care physicians who would have a variable degree of involvement in managing the patients' symptoms and end-of-life goals.

Secondary outcomes measured at 1-year follow-up were (1) all-cause mortality, (2) the number of ED visits, (3) admissions to hospital and (4) involvement with the UOHI Heart Failure Clinic. For those patients who had no information on the EMR, the provincial obituaries were searched to determine patient outcomes.

RESULTS

Patient characteristics

We identified 629 patients from January to August 2013 who were seen in the ED with a diagnosis of heart failure exacerbation. Of these visits, 121 were excluded as those patients' 'index case' had been previously captured in the study. An additional eight patients were excluded as their final diagnosis had either been erroneously coded or involved ischaemic chest pain ([figure 1](#)). The demographic characteristics of the 500 study patients can be found in [table 1](#).

Table 1 Characteristics of 500 patients with heart failure stratified by those who had palliative care involvement and those who did not have palliative care involvement

Characteristics	Total patients n=500	Palliative n=79	No palliative n=421	P values
Female sex (%)	266 (53)	40 (51)	226 (54)	0.63
Age in years, mean (SD)	80.7 (10.6)	81.5 (11.6)	80.6 (10.4)	0.29
Comorbidities (%)				
Dyslipidaemia	303 (61)	50 (63)	253 (60)	0.62
Atrial fibrillation	256 (51)	42 (53)	214 (51)	0.71
Diabetes	202 (40)	39 (49)	163 (64)	0.08
COPD	104 (21)	27 (34)	77 (18)	0.002
Medications (n=498:79:419) (%)				
Diuretic	360 (72)	64 (81)	296 (71)	0.74
Beta blocker	341 (68)	57 (72)	284 (68)	0.51
ACE inhibitor	182 (36)	21 (27)	161 (38)	0.06
Nitrates	74 (15)	19 (24)	55 (13)	0.02
Angiotensin receptor blocker	67 (13)	12 (15)	55 (13)	0.59
Digoxin	62 (12)	16 (20)	46 (11)	0.04
Aldosterone antagonist	41 (8)	15 (19)	26 (6)	<0.001
LVEF (n=315:65:250) (%)				0.69
>40%	215 (68)	45 (70)	170 (68)	
30%–40%	52 (16)	10 (15)	42 (17)	
20%–29%	34 (11)	6 (9)	28 (11)	
<20%	15 (5)	4 (6)	11 (4)	
Creatinine, mean µmol/L (SD)	126 (91)	152 (97)	121 (89)	0.009

COPD, chronic obstructive pulmonary disease; LVEF, left ventricular ejection fraction. Bolded values: p value <0.05.

Main results

At 1-year follow-up, only 41% (n=56) of all deceased patients had any form of documented palliative care consultation. On review of those patients who died with palliative care involvement (n=56), 44 (76%) died within 2 weeks from palliative care consultation and only 12 (20%) had more than a month of

palliative care involvement prior to death. Eight per cent (n=6) of patients had palliative care involvement prior to their index visit.

Of those patients who died within 1 year, [table 2](#) highlights certain differences in outcomes between those patients with and without palliative care involvement.

DISCUSSION

Interpretation

Our study found that very few patients with heart failure had any documented palliative care involvement. This includes a cohort of patients with heart failure with significant disease burden who are potentially not being identified for palliative care. We also found that of patients who died after 1 year, those who received palliative care involvement had statistically significant greater heart failure admissions and had been more likely to be admitted two or more times 6 months preceding their index visit. This is likely a reflection of greater disease burden in these patients prompting palliative care involvement, not a function of their palliative care itself. These patients are a vulnerable group who, through the ED, could be identified as requiring further assistance and potential palliative care referral.

Previous literature

Recently, there has been a significant discussion in the literature and guidelines on developing a more integrated model of heart failure management which includes earlier palliative care and symptom management emphasis.^{2–9} Both the CCS 2011 Heart Failure Management Update and the American Heart Association 2016 policy statement on palliative care and cardiovascular disease emphasise the need to consider palliative care early in the disease trajectory of heart failure and especially in patients with a high symptom burden. While the CCS update identifies multiple quality-of-life questionnaires, neither guideline provides specific criteria to identify patients who would benefit from palliative care involvement.^{6–8}

STRENGTHS AND LIMITATIONS

We feel that the strength of our study lies in the novelty of the research question. This study highlights that only 41% of patients with heart failure who died had any sort of palliative

Table 2 Outcomes from index visit stratified by palliative care involvement in deceased patients

	Total deceased patients n=135	Deceased with palliative n=56	Deceased with no palliative n=79	P values
Outcome: 1-year follow-up				
ED visits, mean (range)				
SOB/HF	0.59 (0–6)	0.75 (0–6)	0.47 (0–3)	0.36
Other	1.5 (0–32)	1.1 (0–10)	1.8 (0–23)	0.62
Admissions, mean (range)				
HF	1.1 (0–10)	1.4 (0–5)	0.89 (0–3)	0.007
Other	0.79 (0–8)	0.72 (0–3)	0.84 (0–6)	0.83
Heart failure clinic involvement (%)				
Prior to index visit and after	4 (3)	1 (2)	3 (4)	0.5
Within 1-year follow-up	7 (5)	4 (7)	3 (4)	0.39
No heart failure clinic involvement	128 (95)	52 (93)	76 (96)	0.39
2+ admissions for any reason in the last 6 months	19 (14)	13 (23)	6 (8)	0.01
2+ encounters requiring intravenous diuretics in the last 6 months	24 (18)	9 (16)	15 (19)	0.67
Creatinine >200 µmol/L at index visit	24 (18)	14 (25)	10 (13)	0.07

HF, heart failure; SOB, shortness of breath. Bolded values: p value <0.05.

care involvement, and it is also unique in that we were able to quantify the duration of palliative care prior to death. This highlights a significant gap in guideline recommended care. This study is a health records review and, as such, does have limitations when interpreting results. On assessment of palliative care involvement, we treated it as a binary variable but did not assess the amount of palliative care involvement. Therefore, there may have been a certain heterogeneity in those patients with palliative care that could have affected the outcomes measured in the study.

Clinical implications

In summary, patients with heart failure are faced with a significant disease burden and are currently being underserved by the palliative care system. Our study has shown that patients with heart failure seen in the ED have a high 1-year mortality rate with limited palliative care involvement. Additionally, of those who have palliative care involvement, overwhelmingly this is within 2 weeks of death, which does not meet current recommendations for early palliative care involvement in heart failure. This study suggests that the ED may be an appropriate setting to identify and refer high-risk patients with heart failure who could benefit from earlier palliative care involvement and is a potential avenue for palliative care access for these patients.

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Contributors ML conceived the idea, collected the data and prepared the manuscript. DE provided considerable assistance in study design and statistics, and revised the manuscript. LMF provided assistance in study design and revised

the manuscript. LM provided expert content opinion, provided the preliminary UOHI palliative care referral pilot data and revised the manuscript. IGS provided considerable statistical assistance, input on study design and revision of the manuscript. ML had full access to all of the data in the study and takes responsibility for the integrity of the data and the accuracy of the data analysis.

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REFERENCES

- 1 The Heart and Stroke Foundation. *Heart and Stroke Foundation Report on the Health of Canadians: The Burden of Heart Failure*, 2016.
- 2 Temel JS, Greer JA, Muzikansky A, *et al*. Early Palliative Care for Patients with Metastatic Non-Small-Cell Lung Cancer. *N Engl J Med Overseas Ed* 2010;363:733–42.
- 3 El-Jawahri A, Greer JA, Temel JS. Does palliative care improve outcomes for patients with incurable illness? A review of the evidence. *J Support Oncol* 2011;9:87–94.
- 4 Gadoud A, Kane E, Macleod U, *et al*. Palliative care among heart failure patients in primary care: a comparison to cancer patients using English family practice data. *PLoS One* 2014;9:e113188.
- 5 Fernandes S, Guthrie DM. A comparison between end-of-life home care clients with cancer and heart failure in Ontario. *Home Health Care Serv Q* 2015;34:14–29.
- 6 McKelvie RS, Moe GW, Cheung A, *et al*. The 2011 Canadian Cardiovascular Society heart failure management guidelines update: focus on sleep apnea, renal dysfunction, mechanical circulatory support, and palliative care. *Can J Cardiol* 2011;27:319–38.
- 7 Jaarsma T, Beattie JM, Ryder M, *et al*. Palliative care in heart failure: a position statement from the palliative care workshop of the Heart Failure Association of the European Society of Cardiology. *Eur J Heart Fail* 2009;11:433–43.
- 8 Braun LT, Grady KL, Kutner JS, *et al*. Palliative care and cardiovascular disease and stroke: a policy statement from the American Heart Association/American Stroke Association. *Circulation* 2016;134:e198–e225.
- 9 McIlvennan CK, Allen LA. Palliative care in patients with heart failure. *BMJ* 2016;353:i1010.