JOURNAL OF PALLIATIVE MEDICINE
Volume 22, Number 8, 2019

DOI: 10.1089/jpm.2018.0513

Comparison of Palliative Care Interventions for Cancer versus Heart Failure Patients: A Secondary Analysis of a Systematic Review

Megan Bannon, BA,[1] Natalie C. Ernecoff, MPH,[2] J. Nicholas Dionne-Odom, PhD, RN,[3]
Camilla Zimmermann, MD, PhD,[4] Jennifer Corbelli, MD, MSc,[1] Michele Klein-Fedyshin, MSLS, BSN, RN,[5]
Robert M. Arnold, MD,[6] Yael Schenker, MD, MAS,[6] and Dio Kavalieratos, PhD[2,6]

Abstract

Background: In 2016, Kavalieratos and colleagues performed a systematic review of randomized clinical trials (RCTs) of palliative care (PC) interventions. The majority of RCTs included focused on oncology, with fewer in heart failure (HF). Cancer patients' often predictable decline differs from the variable illness trajectories of HF; however, both groups experience similar palliative needs, and accordingly, PC in HF continues to grow.
Objective: To investigate if PC interventions differ between cancer and HF patients.
Design: In this secondary analysis, we compare PC interventions for cancer and HF patients evaluated in the 2016 systematic review.
Settings/Subjects: We included a total of 25 trials, 19 of which included 3730 cancer patients, and 6 of which included 1049 HF patients (mean age, 67 years).
Measurements: We compared the following five characteristics among included trials: PC domains addressed, duration, location, provider specialization, and measured outcomes.
Results: The content of the cancer and HF interventions was similar. HF interventions tended to include more home-based (50% vs. 37%) and specialty PC interventions (67% vs. 47%), although these results did not reach statistical significance. Both cancer and HF interventions favored longer durations (i.e., more than one month; 79% and 67%). No HF intervention RCTs included caregiver outcomes, whereas 32% of cancer interventions did.
Conclusions: There were no substantial differences in content of cancer and HF interventions, although the latter tended to be delivered by PC specialists at home. There is a need for scalable interventions that incorporate the needs and preferences of individual patients, regardless of diagnosis.

Keywords: models of palliative care; palliative care interventions; randomized clinical trials; systematic review

Introduction

As the field of palliative care (PC) matures, it is time to investigate gaps in its evidence base to enable the continued innovation and refinement of research and clinical practice. One such remaining question is whether palliative interventions should differ for various diseases, or if a disease-generic approach to intervention design is sufficient to meet the needs of most patients receiving PC.

Although cancer is historically the most prevalent diagnosis served by PC, the landscape of diseases represented in PC practice continues to diversify; in 2017, the National

---

[1] Division of General Internal Medicine, Department of Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania.
[2] Department of Health Policy and Management, Gillings School of Global Public Health, University of North Carolina at Chapel Hill, Chapel Hill, North Carolina.
[3] School of Nursing, University of Alabama at Birmingham, Birmingham, Alabama.
[4] Department of Medicine, University of Toronto, Toronto, Ontario, Canada.
[5] Health Sciences Library System, University of Pittsburgh, Pittsburgh, Pennsylvania.
[6] Section of Palliative Care and Medical Ethics, Division of General Internal Medicine, Department of Medicine, University of Pittsburgh, Pittsburgh, Pennsylvania.
Accepted January 9, 2019.

Palliative Care Registry reported cancer as the primary diagnosis of only 26% of PC patients, whereas patients with heart failure (HF) comprised the greatest proportion of noncancer diagnoses at 15%.[1] Yet, to date, patients with HF have not yet been as much of a focus of PC research. A 2016 systematic review and meta-analysis concluded that PC interventions are associated with decreased symptom burden and improved quality of life in patients with serious illnesses.[2] The PC trials included in the review needed to address at least two of the eight ''domains of palliative care'' defined by the National Consensus Project for Quality Palliative Care.[3] The formats of the trials included were not limited to a specific type of PC intervention; they varied from longitudinal telephone-based interventions, delivered by advanced practice nurses with PC specialty training, to acute inpatient interventions delivered by oncology advanced registered nurse practitioners. The risk of bias for each of the trials was rated by two investigators separately, using the Cochrane Collaboration tool.[4] Nineteen of the included trials were of oncology samples, while only six trials focused on PC interventions among patients with HF.

Nevertheless, research exploring the role of PC in HF continues to grow. A 2017 review of six PC randomized clinical trials (RCTs) conducted among HF patients described generally positive results across a variety of outcomes, such as improved quality of life and reduced health care utilization.[5] Yet, the authors noted to optimize the impact and patient centeredness of PC in HF, the nascent evidence base would need to further investigate whether the historically oncology-influenced framework of PC intervention ideally meets the needs of populations with chronic, nonmalignant illnesses, such as HF. Yet, what remains absent from the literature is a head-to-head comparison of the PC interventions tested to date in oncology and HF populations.

In this secondary analysis of the 2016 review, we compare the content and design of PC interventions for cancer and HF patients across five characteristics: domains of PC included in interventions, duration, location, provider specialization, and measured outcomes.

Methods

This study is a secondary analysis of data from a 2016 systemic review and meta-analysis of RCTs, which examined the effectiveness of 43 PC interventions on patient-, caregiver-, and systems-level outcomes.[2] For this analysis, we included 25 of the 43 clinical trials that either comprised patients with cancer or patients with HF. The 18 excluded trials that comprised patients with diseases other than cancer or HF, or trials including both cancer and noncancer patients, but did not report outcomes by disease (i.e., mixed trials). A structured form was used to extract data about each intervention: PC domains addressed, duration, location of the intervention, provider specialization, and measured outcomes (Supplementary Tables S1 and S2). For example, a 2009 trial of patients recently diagnosed with gastrointestinal, genitourinary, or breast cancer used a manualized, psychoeducational intervention to help patients in such domains as symptom management, communication, and advance care planning.[6] This study included patients with prognoses of approximately one year and included four weekly educational sessions with monthly follow-up sessions, which reinforced session content and referred patients to appropriate care resources until patient deaths.[6]

Intervention content was categorized as per the eight domains of high-quality PC: physical, psychological, social, structure, spiritual, legal, end oflife, and cultural.[3] To be included in both the parent study and in this analysis, interventions included greater than or equal to two of eight PC domains. Intervention duration was defined as acute (i.e., intervention lasted less than or equal to one month) or longitudinal (greater than one month). We categorized intervention location as inpatient, outpatient, home, or telephone based, or mixed. Provider specialization was defined as specialty or primary PC. Specialty PC was defined as physicians and nurses with board certification or subspecialty training in PC. If conducted before PC board certification, studies that demonstrated use of professionals with extensive experience in PC (e.g., in-depth communication skills training, ethics consultant, or extensive experience in hospice or PC consultation) were also categorized as specialty PC. Primary PC was defined as clinicians and nurses with no formal training in PC, brief training in primary PC skill areas, such as advance care planning, goals-of-care communication, and pain and symptom management, or training exclusively for the research project (such as an in-depth protocol). Despite several of the interventions including multiprofessional teams that comprised both generalists and specialists, any specialist PC involvement led to a categorization of specialty PC. Where unclear, provider specialization was determined through review and consensus by four investigators.

Results

Of the 43 total trials included in the 2016 systematic review, there were 19 (44%) that evaluated cancer interventions and 6 (14%) that evaluated HF interventions.

The physical, psychological, and social domains were the most frequently assessed in both cancer (100%, 95%, and 84%, respectively) and HF (100%, 100%, and 83%, respectively) interventions. Compared with the cancer interventions, the HF interventions more frequently addressed the structural (100% vs. 68%), spiritual (67% vs. 47%), and legal (67% vs. 37%) domains of PC. The cancer interventions more often addressed the end-of-life PC domain (32% vs. 0%). None of the interventions addressed the cultural aspects of care.

Regarding trial locations, most of the cancer PC trials took place in home-based (37%) and mixed settings (37%), with inpatient (10%) and outpatient (16%) settings utilized less commonly. Likewise, the HF PC interventions most frequently used home-based (50%) and inpatient (33%) settings, with mixed settings (17%) and outpatient (0) settings being less utilized.

Regarding intervention duration, both cancer and HF interventions favored longer durations (i.e., more than one month; 79% and 67%) compared with shorter durations (21% and 33%). Regarding provider specialization, cancer trials were almost evenly spread between specialty and primary models of PC (47% and 53%). HF interventions more often used specialty PC models (67% vs. 33%). Regarding the nine trial outcome measures included in the 2016 review, cancer and HF PC trials were comparable in their measurement of patient quality of life (79% and 67%) and physical symptom burden (68% and 67%). HF interventions more frequently measured survival (67% vs. 21%), advance care planning (50% vs. 5%), resource utilization and expenditures (100% vs. 32%), and satisfaction with care (17% vs. 5%) than the cancer interventions. The cancer interventions more frequently measured patient mood (47% vs. 33%), site of death (5% vs. 0%), and caregiver outcomes (32% vs. 0%) compared with HF interventions.

Discussion

In this secondary analysis of the largest systemic review of PC to date, we found few differences in the content of the RCTs of PC interventions between cancer and HF patients. There is debate surrounding whether the differences in life-limiting illnesses warrant disease-specific approaches to PC. Whereas cancer is often thought to be characterized by a predictable decline in health over a period of time, HF often exhibits an unpredictable trajectory, uncertain prognosis, and timing of death.[7] Whereas some research suggests that patients' palliative needs differ between cancer and HF,[8,9] a large rigorous cohort study in 2011 found that among patients with cancer, HF, and chronic obstructive pulmonary disease, needs were more related to disease stage, rather than the disease itself.[10] Similarly, a 2014 review found few differences in the prevalence of PC-related problems (i.e., pain, fatigue, depression, dyspnea, and anxiety) among people living with cancer and HF.[11] In turn, flexible interventions that model services based on a patient's specific needs, rather than dichotomization of cancer versus noncancer, are likely to yield a more patient-centered approach to care; indeed, such a flexible approach is also reflective of how PC is often practiced in the real world.

Limitations

First, the small number of trials included precluded our ability to test for statistically significant differences. Second, this secondary analysis was limited to the RCTs included in the 2016 systematic review and meta-analysis. Third, despite each trial being evaluated for risk of bias, there still remains heterogeneity among the trials being compared (e.g., no distinction made between ''early'' vs. end-of-life PC interventions). Finally, we could be understating the elements that were included in the interventions as they were not reported transparently, a challenge also encountered by the authors of the 2016 systematic review. Future trials should strive for transparency and reproducibility when reporting intervention structure and content, using tools such as the template for intervention description and replication (TIDieR) checklist.[12]

Conclusion

As the PC evidence base expands, our work serves as a reminder that intervention development should include important formative inquiry to identify whether needs exist within that population that, if ignored, might compromise the uptake and impact on patient and caregiver outcomes. In addition, the development of patient-centered models of PC may require collaboration with specialists in those clinical disciplines, who are familiar with idiosyncratic disease processes, symptoms, and treatments.[5,13] Finally, given that none of the included HF PC interventions assessed caregiver outcomes, future trials should seek to establish the efficacy of PC in alleviating HF caregiver suffering.

Acknowledgments

The authors sincerely thank the following individuals for their help in conducting the original systematic review from which these data originate: Zachariah Hoydich, BS, Dara Ikejiani, BS, Janel Hanmer, MD, PhD, Lucas Heller, MD, and Sally Morton, PhD. Dr. Kavalieratos receives research funding from the National Heart Lung and Blood Institute (K01HL133466), and the Cystic Fibrosis Foundation (KAVALI18QI0, PILEWS14QI0). Dr. Dionne-Odom receives research funding from the National Institute of Nursing Research (R00NR015903).

Author Disclosure Statement

No competing financial interests exist.

Supplementary Material

Supplementary Table S1
Supplementary Table S2
Supplementary References

References

1. The Center to Advance Palliative Care and the National Palliative Care Research Center: 2017 National Palliative Care Registry™ Hospital Table. National Palliative Care Registry 2017;20. https://registry.capc.org/wp-content/uploads/2018/07/2017_Findings.Slides.pdf (last accessed February 7, 2019).
2. Kavalieratos D, Corbelli J, Zhang D, et al.: Association between palliative care and patient and caregiver outcomes: A systematic review and meta-analysis. JAMA 2016;316: 2104–2114.
3. Dahlin C: *Clinical Practice Guidelines for Quality Palliative Care, 3rd ed*. Pittsburgh, PA: National Consensus Project for Quality Palliative Care, 2013.
4. Higgins JPT, Green S (eds.): *Cochrane Handbook for Systematic Reviews of Interventions Version 5.1.0*. 2011. The Cochrane Collaboration. www.handbook.cochrane.org (last accessed February 2019).
5. Kavalieratos D, Gelfman LP, Tycon LE, et al.: Palliative care in heart failure: Rationale, evidence, and future priorities. J Am Coll Cardiol 2017;70:1919–1930.
6. Bakitas M, Lyons KD, Hegel MT, et al.: Effects of a palliative care intervention on clinical outcomes in patients with advanced cancer. JAMA 2009;302:741–749.
7. Lunney JR, Lynn J, Foley DJ, et al.: Patterns of functional decline at the end of life. JAMA 2003;289:2387–2392.
8. Murray S, Boyd K, Kendall M, et al.: Dying of lung cancer or cardiac failure: Prospective qualitative interview study of patients their carers in the community. BMJ 2002;325:1–5.
9. Kavalieratos D, Kamal AH, Abernethy AP, et al.: Comparing unmet needs between community-based palliative

care patients with heart failure and patients with cancer. J Palliat Med 2014;17:475–481.

10. Steinhauser KE, Arnold RM, Olsen MK, et al.: Comparing three life-limiting diseases: Does diagnosis matter or is sick, sick? J Pain Symptom Manage 2011;42:331–341.
11. Moens K, Higginson IJ, Harding R, Euro I: Are there differences in the prevalence of palliative care-related problems in people living with advanced cancer and eight non-cancer conditions? A systematic review. J Pain Symptom Manage 2014;48:660–677.
12. Hoffmann TC, Glasziou PP, Boutron I, et al.: Better reporting of interventions: Template for intervention description and replication (TIDieR) checklist and guide. BMJ 2014;348:g1687.
13. Fallon M, Foley P: Rising to the challenge of palliative care for non-malignant disease. Palliat Med 2012;26:99–100.

Address correspondence to:
Dio Kavalieratos, PhD
Section of Palliative Care and Medical Ethics
Division of General Internal Medicine
Department of Medicine
University of Pittsburgh
230 McKee Place, Suite 600
Pittsburgh, PA 15213

E-mail: diok@pitt.edu