Quality of life trends in people with and without cancer referred to volunteer provided palliative care services (ELSA): A longitudinal study

Catherine Walshe[1] 0000-0002-4531-8608

Nancy Preston[1] 0000000326592342

Sheila Payne[1] 0000-0001-6982-9181

Steve Dodd[1]

Guillermo Perez Algorta[2] 0000-0001-6610-4951

[1]The International Observatory on End of Life Care,
Division of Health Research, Lancaster University,
Bailrigg, Lancaster, LA1 4AY

[2]Division of Health Research, Lancaster University,
Bailrigg, Lancaster, LA1 4AY

Corresponding author: Catherine Walshe, c.walshe@lancaster.ac.uk +44 (0)1524 510124

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Abstract

Context: Trends in symptoms and functional ability are known towards the end of life, but less is understood about quality of life, particularly prospectively following service referral.

Objectives: This study compares quality of life trajectories of people with and without cancer, referred to volunteer provided palliative care services.

Methods. A secondary analysis of the ELSA trial (n = 85 people with cancer and n = 72 without cancer). Quality of life data (WHOQOL-BREF) were collected at baseline (referral), 4, 8 and 12 weeks. Socio-demographic data were collected at baseline. We specified a series of joint models to estimate differences on quality of life trajectories between groups adjusting for participants who die earlier in the study.

Results. People with cancer had a significantly better quality of life at referral to the volunteer provided palliative care services than those with non-malignant disease despite similar demographic characteristics (Cohen *d's*=.37 to .45). More people with cancer died during the period of the study. We observed significant differences in quality of life physical and environmental domain trajectories between groups (*b* = -2.35, *CI* -4.49, -0.21, and *b* = -4.11, *CI* -6.45, -1.76). People with cancer experienced a greater decline in quality of life than those with non-malignant disease.

Conclusion. Referral triggers for those with and without cancer may be different. People with cancer can be expected to have a more rapid decline in quality of life from the point of service referral. This may indicate greater support needs, including from volunteer provided palliative care services.

Keywords

Palliative Care, volunteers, quality of life, pragmatic clinical trial, cancer

Background

Experientially, quality of life for those with life-limiting illness is critically important, as people may prioritise quality of life over treatment that extends its quantity(1). Palliative care services have a focus on quality of life, but access can be limited or late. Recent data indicate that people with cancer remain likely to receive aggressive end-of-life interventions including chemotherapy, repeated hospitalizations, ICU admission and late hospice or palliative care enrolment(2, 3). Volunteer provided palliative care services designed to complement clinical care may offer options which facilitate earlier care (4, 5).

Our study of volunteer provided palliative care services is the first reported trial in this area(6). Whilst the intervention effect was small, the longitudinal quality of life data of those referred are a novel addition to knowledge, helping understanding of referral timing and change over time. Studies of quality of life trends for those in the palliative phase of illness are scarce, despite being perceived as an important outcome of trials of palliative care interventions(7-9). Understanding trends in quality of life is important both clinically and to improve research so that interventions can be carefully timed, contextualised and evaluated(10-12). Response shift is a particular concern, where people re-appraise illness and their quality of life and accommodate its challenges and their perceptions, leading to problems interpreting standard measures over time(13, 14).

Trajectory data for people towards the end of life tends to focus on functional change, augmented with understandings of social, psychological and physical change, rather than quality of life(15, 16). Studies use either qualitative interviews to understand change over time(16-29), or measure change quantitatively(12, 28, 30-47). Typically, these studies only focus on one diagnosis, track symptoms or functional change rather than quality of life, or use limited data, often from those accessing in-patient clinical services. Some explain the trajectory retrospectively from point of death, but this is less useful clinically due to the inherent problems of prognostication accuracy(48). Prospective studies are less common, especially for those referred to non-clinical services(49). This study adds to knowledge by reporting longitudinal, prospectively collected, quality of life data, of those expected to be in their last year of life who were referred to volunteer provided palliative care services.

Patients and methods

Design:

This prospective, longitudinal, multicenter study of people understood to be in their last year of life assessed quality of life in the 12 weeks following referral to a volunteer provided befriending service. Data were collected in the context of a pragmatic, randomized, prospective wait-list trial; the study protocol and reports are available, and the trial prospectively registered (6, 50, 51). The aim of this exploratory analysis was to prospectively compare the quality of life of people (with and without cancer) referred to these services.

Participants and setting:

Eligible participants were adults (≥18 years) referred to the volunteer provided palliative care services where the answer to the surprise question ‘would you be surprised if the patient dies within a year?’, assessed by the referring healthcare professional, was ‘no’(52). They could have any diagnosis. They had to understand or speak a language in which our main outcome measure (the WHOQOL-BREF) was available, and have an anticipated prognosis of > 4 weeks. The volunteer provided palliative care services were provided in 11 community settings across England (9 hospices, 1 alcohol and substance use charity, 1 NHS Trust). Participants continued to receive all usual care during the study. NHS Research Ethics Committee approval was received, and governance approvals from each participating site. All participants gave written consent.

Data collection:

Data were collected at study entry, and 4 and 8 weeks following that point. Those in the ‘wait’ arm of the trial also provided data at 12 weeks. Quality of life was assessed using the World Health Organisation Quality of Life (WHOQOL-BREF) Scale, a relatively short, but broad (26 item) non disease specific, validated self-reported measure of quality of life and wellbeing(53). Data are reported across physical, psychological, environment and social relationship domains. Loneliness was assessed with the De Jong Gierveld 6-item Loneliness Scale, a short, well-used, reliable and valid measurement instrument(54). Social support was assessed using the 8-item modified Medical Outcomes Study Social Support Survey (mMOS-SS), a short validated scale covering two domains of emotional and social support(55). Additional data included self-reported contact with health and social care services and other networks over the previous 2 weeks, and baseline socio-demographic data (age, gender, disease diagnosis, education, marital status, living status, spirituality and ethnicity). Study instruments were self-completed by participants, baseline questionnaires were explained to participants when written consent taken at a home visit, subsequent questionnaires were posted to participants' home address, self-completed, and returned by post to the study team.

Statistical analysis:

Participants were characterised in terms of reported primary diagnosis (cancer vs. non-cancer), accounting for no detected difference in primary and secondary outcomes between intervention and control groups(6). Baseline characteristics between diagnostic groups were compared using *t* or Chi-square test, irrespective of original random treatment allocation. To test for diagnostic status (cancer vs non-cancer) effect on quality of life trajectories, we specified a series of joint models(56, 57). These joint models simultaneously model the longitudinal outcome (quality of life) of interest and risk of death, by adjusting for participants who die earlier in the study. In end-of-life studies and those involving older people, a significant proportion of participants may die, with survivors contributing disproportionately larger amounts of data than decedents. The tendency for healthier persons to live longer and contribute more data may lead to a "healthy survivor" effect in estimates obtained from a longitudinal analysis(58), so it is important this is accounted for in modelling these data. As part of the joint model, we specified a linear mixed model with intercept and random slopes. We tested the main effect of time and the interaction of time with diagnostic status to evaluate for potential differences in quality of life trajectories between groups. In the Cox model, we added diagnostic group as a time-independent covariate. We used a (pseudo) adaptive Gauss-Hermite optimization algorithm(59). We report parameter estimates, standard errors and 95% confidence intervals.

Results

Of those referred to the volunteer provided palliative care services (n=329), 196 consented to take part in the study, and 157 provided evaluable data for this analysis. At each time point missing data were noted, but participants continued to be enrolled in the study unless advised otherwise, as data sets could be and often were returned at subsequent time points. Twenty percent of enrolled participants (39 of 196) died during the study. The overall flow through the study is presented in figure 1. Data were collected in 2015-6.

< *Insert figure 1 around here: Figure 1. Study participant flow.>*

Baseline demographic, quality of life, loneliness and social support data for the 157 participants who provided diagnostic information, enabling these analyses, are presented in table 1. There were no significant differences on demographic characteristics between those with cancer and with other non-malignant conditions. Of those without cancer, the study included those with respiratory disease (n=26), neurological disease (n=21), heart failure (n=10), liver disease (n=7), and other forms of life-limiting illness (n=8).

< *Insert table 1 around here: Table 1 Baseline demographic, quality of life, loneliness and social support data for those who provided a diagnosis.>*

There were significant differences between baseline scores on areas of quality of life (*d's*=.37 to .45), social loneliness (*d*=.37) and emotional social support (*d*=.44) between those with and without cancer. Those with non-malignant life limiting disease typically had worse quality of lie, were lonelier and had less social support on referral to the volunteer provided palliative care services. All differences reflect small effect sizes.

We evaluated the distribution of quality of life at different time points by group. Despite the impact of attrition on our sample, we observed a normal distribution, with good coverage of spread of scores (Table 2, Figure 2).

< *Insert Table 2 and Figure 2 around here.> Table 2. Distribution of quality of life scores at different time points. Figure 2. Distribution of quality of life scores at different time points.*

By the end of the study, 31 people in this sample had died, 27 of those with cancer, and 4 of those with non-malignant disease. Data on change in quality of life are reported in table 3 for the physical, psychological and environmental domains of the WHOQOL-BREF.

< *Insert table 3 around here: Table 3 Change in quality of life over time*>

Whilst people with cancer have a generally higher quality of life at referral to the volunteer provided palliative care service (baseline), their quality of life deteriorates significantly more rapidly over the (relatively short) data collection period to the end of the study compared to those without cancer (Figures 3 and 4).

<Insert figures 3 and 4 around here: Figure 3. Change in quality of life (physical domain) over study data collection time points. Figure 4. Change in quality of life (environmental domain) over study data collection time points. >

Discussion

These are novel longitudinal quality of life data from those anticipated to be in their last year of life who were referred to volunteer provided palliative care services. At referral to the service (baseline), demographic characteristics of those with and without cancer are similar, but those with non-malignant life limiting illnesses had a worse quality of life, were lonelier, and had less social support. This may indicate they had more need for palliative care services at the time of referral. During the relatively short (12 week) period of data collection however, those with a cancer diagnosis had a more rapidly deteriorating quality of life. More people with cancer died during the study period. These are different trajectories of quality of life for people with cancer and non-cancer diagnoses who were nevertheless identified as requiring similar volunteer provided palliative care services.

The baseline quality of life scores of those referred to the volunteer provided palliative care services can be compared to reference data. This demonstrates that quality of life of both those with and without cancer in this sample are worse than people who are healthy or in the general population(60-62), but with similarities to those known to have life limiting illness or be users of specialist palliative care(63-65). This may indicate that the triggers for referral, at least in terms of need relating to quality of life, are similar both where referral to volunteer provided palliative care services, and a specialist palliative care service are considered. Minimal clinically important differences are not reported for the WHOQOL-BREF, but it has been reported to be sensitive to change in health status (62). Typically half a standard deviation is considered a clinically relevant change in health related quality of life (66, 67), a magnitude similar to the estimated change observed in our sample at the end of the study.

People with life-limiting illness who do not have cancer are known to be referred to services at a point in time where their functional status is typically worse than those with cancer. For example, those referred to specialist palliative care services with primary diagnoses other than cancer have been found to be less functional at time of referral (odds ratio: 1.6; 95% CI: 1.1, 2.3). This was felt to be because of the slower and more varied trajectory of non-cancer serious illness, typified by greater disability(40, 68). Our data are important as they identify that this differentiation in baseline status (whether in quality of life or functional status) at point of referral to services is also true for referral to a very different volunteer provided palliative care services as for referral to specialist palliative care. Specialist palliative care is typically triggered later in the disease course for those without cancer(3, 69), but this may not necessarily have been expected for those referred to a volunteer provided palliative care service. People with non-cancer life-limiting disease appear to have been deteriorating for a longer period of time, with more impact on quality of life, before need is recognised and referral to services made. Reasons for this may include having more time to adapt to a lower functional status, less appreciation of the life-limiting nature of the illness, less routine assessment of need, or discrimination against some disease e.g. COPD where lifestyle behaviours such as smoking contribute to risk(70-72). In the UK hospice and palliative care services are also historically focused on, and predominantly used by, those with cancer(3, 73).

Even over the relatively short period of time data were collected for this study, people with cancer demonstrated a more rapid deterioration in quality of life. Comparisons with other studies are challenging, as many only include people with a single diagnosis, typically cancer, but not with a comparison to other disease trajectories (28, 30-32, 37, 42, 44, 74-77). These studies show that people with cancer do report poorer quality of life over time(44), which is broadly characterised as a gradual decline, accelerating in the last months of life. There are studies however which do not demonstrate such changes, with no changes in quality of life found in those referred to a community palliative care service(46), and a study of those with lung cancer which found that those with good quality of life did not change as they approached the end of life(45). Where studies do compare people with and without cancer, typically steeper declines are found in functional status or quality of life for those with cancer(33, 34, 39), with more disability three months prior to death(12). Our study adds to this scarce comparative literature, strengthening the evidence base on the different trajectories of those with and without cancer at the end of life. In particular our study adds data on quality of life rather than the more typical functional status, prospectively gathered, rather than judged retrospectively from death.

The strengths of this study are in the relatively large sample, with different life-limiting illnesses, providing data prospectively over a number of time points. The follow up time points were carefully and deliberately chosen to be short, given that the study was at the end of life, and care effects need to be rapid to be worthwhile, but it is possible that a longer term follow up may reveal different trends. A potential limitation is that these data were provided in the context of an interventional trial, and this may affect people's responses to outcome measures in unanticipated ways. Diagnosis data were unavailable for 20 participants, and they had to be removed from this data set, we did not have direct access to clinical data to address this issue. This lack of access to clinical data mean that we do not know if participants were receiving any potentially disease modifying treatments which could affect quality of life. It is known that the predictive value of the surprise question in identifying those who may die is not perfect, with worse performance in non-cancer illness(78). It may be that some of those referred are not in their last year of life, with differences in prediction between those with and without cancer. This may be why fewer of those who died were in the non-cancer group. However the baseline data from both groups, and comparison to population norms, nevertheless indicates that these are groups eligible for palliative care, and we carefully controlled for survival differences in our joint model. Our data reflect 'real-life' referral patterns to a novel intervention, rather than the sample being representative of these diagnostic populations, and there is strength in these data because of this diversity. We aggregated quality of life data for those with non-malignant conditions, as it is known that those with chronic conditions do have similar quality of life trends (62), but it must be noted that their patterns of quality of life may not be the same.. Our study adds to knowledge methodologically by using joint models that take into account the effect of participants who die earlier in the study. Information on the deaths of those in the study was provided contemporaneously, but exact dates of death were not known for some, and it is possible that some of those for whom we had missing data may have died.

People with life-limiting illness appear to be referred to volunteer provided palliative care services both close to death (for those with cancer), or with a poor quality of life (for those with non-malignant disease). The rapid decline in quality of life experienced by those with cancer may indicate that their support needs are greater in this phase of life, potentially necessitating additional support from volunteers in addition to clinical services.

Declarations

Ethics approval and trial registration: All procedures performed in studies involving human participants were in accordance with the ethical standards of the institutional and/or national research committee and with the 1964 Helsinki declaration and its later amendments or comparable ethical standards. The trial was prospectively registered. ISRCTN 12929812 http://www.isrctn.com/ISRCTN12929812 Health Research Authority research ethics approval was granted 12.3.15 by NRES Committee Yorkshire & The Humber - South Yorkshire. REC reference 15/YH/0090. IRAS project ID 173058. Site specific approvals were granted by NRES Committee Yorkshire and the Humber – South Yorkshire. Informed consent was obtained from all individual participants included in the study.

Availability of data and materials: Patient level data are stored in the ELSA database developed by the study authors on a secure server maintained by Lancaster University. Presented data are fully anonymised. The corresponding author may be contacted to forward requests for data sharing.

Competing interests: The authors declare they have no competing interests.

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