

Comparison of respiratory health-related quality of life in patients with intractable breathlessness due to advanced cancer or advanced COPD

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ABSTRACT

Objectives

Breathlessness is common in patients with advanced cancer and almost universal in advanced chronic obstructive pulmonary disease (COPD), but studies suggest their experiences of breathlessness vary. This report builds on these studies by providing quantitative evidence of differences in respiratory health-related quality of life (HRQoL) between these groups. Further, it explores the validity of the Chronic Respiratory Questionnaire (CRQ) in patients with cancer.

Methods

The CRQ-Original was completed within baseline interviews for a randomised controlled trial of a palliative intervention for intractable breathlessness due to advanced disease. Independent-Samples Mann-Whitney U Tests were performed to identify significant differences in median scores for the four CRQ domains (mastery, dyspnoea, emotional function, fatigue) in patients with advanced COPD (n=73) or advanced cancer (n=67.) The Minimally Clinically Important Difference (MCID) of 0.5 was applied to determine clinical significance.

Results

Patients with advanced COPD scored lower across all four CRQ domains. This was statistically significant for dyspnoea, mastery, and emotional function ($p < 0.05$), and clinically significant for the latter two, suggesting poorer respiratory HRQoL.

Conclusions

Patients with breathlessness due to advanced COPD have worse respiratory HRQoL than those with advanced cancer. This may result from greater burden of breathlessness in COPD due to condition-longevity, lesser burden of breathlessness in cancer due to its episodic nature, or variance in palliative referral thresholds by disease group. Our results suggest greater access to palliative care is needed in advanced COPD and that formal psychometric testing of the CRQ may be warranted in cancer.

BACKGROUND

Breathlessness, the most common symptom of advanced chronic obstructive pulmonary disease (COPD), is also highly prevalent in cancers of all primary sites.[1] A recent study demonstrated that patients with COPD differ significantly in their experiences of breathlessness compared to patients with cancer, and that such differences are important for effective intervention targeting.[2] Little is known about the impact of these differences on respiratory health-related quality of life (HRQoL.) Greater understanding of this could help determine effective ways to palliate symptoms in these diagnostic groups. Further, there is significant demand in the literature for a single HRQoL outcome measure suitable for use across disease groups to enable comparison within and between studies and disciplines.[3,4] For example, Parshall et al. have commented that studies of breathlessness are too often 'siloes by disease or by specialty or by disciplinary focus.' [4] Exploration of HRQoL data collection using a single outcome measure across disease groups is therefore warranted.

The Chronic Respiratory Questionnaire-Original (CRQ-Original) is an interviewer-administered respiratory HRQoL questionnaire that is reproducible, responsive, and widely used for research. Other versions, such as the CRQ-SA (self-administered), have been developed, and are reportedly as valid as the original.[5] The CRQ's relative brevity increases its potential for use within clinical practice. It produces scores of 0-7 (lower score represents poorer respiratory HRQoL) across four respiratory HRQoL domains: dyspnoea (how breathless the patient feels), mastery (how in control of their condition the patient feels), emotional function (extent to which their condition affects them emotionally), and fatigue (extent to which their condition makes them feel tired.) The CRQ is validated for use in chronic airflow limitation and many other conditions but not, as yet, in cancer.[3, 6] However, given the commonality of respiratory symptoms in patients with cancer, the CRQ has frequently been used as a research tool in this diagnostic group.[7] Indeed, two recent

randomised controlled trials (RCT) of breathlessness interventions used the CRQ as an outcome measure in patients with breathlessness due to advanced cancer.[7,8] In the Cambridge study[8] the tool was well received by patients with cancer; they did not question the relevance of items, or appear challenged in responding to them, suggesting face validity.[Personal Communication. Farquhar MC. 20/04/2015] There is also increasing evidence that cancer should be seen as a chronic disease, potentially increasing the relevance of outcome measures for chronic illness to this diagnostic group.[4] Nonetheless, no consensus has been reached on whether the CRQ is valid for measuring respiratory HRQoL in cancer. The validation of the CRQ for use in this diagnostic group would provide a single outcome measure for analysis of respiratory HRQoL in both malignant and non-malignant disease, for which there is demand.

AIM

This report aims to provide quantitative evidence of differences in respiratory HRQoL between patients with breathlessness due to advanced COPD or advanced cancer. This builds on previous research highlighting that these diagnostic groups experience breathlessness differently, and responds to the demand in the literature for further exploration of how these two groups compare in their experiences of breathlessness.[1] Secondly, it aims to explore whether formal psychometric testing of the CRQ to establish its use as a respiratory HRQoL instrument for patients with cancer is warranted.

METHODS

Data were collected within baseline interviews for a Phase III single-blinded fast-track pragmatic RCT of the Cambridge-based multidisciplinary palliative care service CBIS: a complex intervention delivering pharmacological and non-pharmacological interventions to patients with intractable breathlessness of any cause, including advanced COPD or advanced cancer of any primary site.[8] Independent-Samples Mann-Whitney U Tests were used to determine whether there were statistically significant differences between the median mastery, dyspnoea, fatigue, and emotional function CRQ scores of patients with COPD (n=73) or cancer (n=66; 49.3% lung, 19.4% breast.) The Minimally Clinically Important Difference (MCID) of 0.5 was applied to the differences of means to determine if there was a clinically significant difference between the mean CRQ scores of patients with COPD and cancer; the mean was used rather than medians as the MCID was originally determined using means.[10] An Independent-Samples T-Test and Chi-squared test were used to determine if there was any significant difference in age or sex respectively between the two diagnostic groups.

RESULTS

The patients' median Global Initiative for Chronic Obstructive Lung Disease (GOLD) classifications (COPD: 3, IQR=1) and Australian Modified Karnofsky scores (cancer: 70, IQR=20; COPD: 60, IQR=30) reflect their advanced disease stage. Patients with advanced COPD had a lower median score across all four CRQ domains compared to patients with advanced cancer. These differences were statistically significant for the dyspnoea, emotional function, and mastery domains ($p < 0.05$.) Differences in the means were clinically significant for the mastery and emotional function domains when the MCID threshold of 0.5 was applied, but not for the fatigue or dyspnoea domains.[Table 1] There was no significant difference in the mean age of patients by diagnostic group (COPD: 71.12 years, SD=10.07; cancer: 68.66 years, SD=11.46; $t=1.36$, $p=0.178$.) However, there was a significant difference in sex by diagnostic group, with a greater proportion of males in the advanced COPD group: 45 male and 28 female in the COPD group, and 26 male and 40 female in the cancer group (χ^2 (1, N=139) = 6.867, $p=0.009$.) Therefore, independent-Samples Mann-Whitney U Tests were used to compare median CRQ scores by sex in each diagnostic group. In both diagnostic groups, there was no statistical difference in the median CRQ scores by sex for the dyspnoea, emotional function, and mastery domains, demonstrating that differences in sex did not have a statistically significant effect on the CRQ scores.

Table 1 CRQ-Original scores by diagnostic group with associated p values

CRQ Domain	Advanced Diagnostic Group	Median	75 th -25 th Percentiles	Mean	Standard deviation	P value from Independent-Samples Mann-Whitney U Test	Differences in Means for MCID Calculation
Mastery	COPD	3.75	4.75-2.75	3.81	1.28	0.001*	0.71**
	Cancer	4.50	5.50-1.75	4.52	1.22		
Dyspnoea	COPD	3.00	3.60-2.40	3.02	0.93	0.038*	0.39
	Cancer	3.50	4.00-2.60	3.41	0.98		
Fatigue	COPD	2.88	3.75-2.00	2.97	1.13	0.126	0.32
	Cancer	3.25	4.19-2.25	3.29	1.20		
Emotional Function	COPD	3.86	4.33-3.11	3.84	1.13	0.004*	0.51**
	Cancer	4.50	5.14-3.57	4.35	1.06		

*p<0.05, **meets MCID=0.5 as the threshold for clinically significant difference

DISCUSSION

Patients with advanced COPD referred for a palliative intervention for breathlessness had lower median scores across all four domains of the CRQ compared to patients with breathlessness due to advanced cancer. These differences were statistically significant for the dyspnoea, mastery, and emotional function domains, and clinically significant for the latter two domains. The differences were not explained by differences in sex between the two groups. This suggests that patients with advanced COPD referred for specialist palliative support had worse respiratory HRQoL than patients with breathlessness due to advanced cancer.

There are three possible reasons for this finding. Firstly, patients with COPD experience respiratory symptoms such as breathlessness much earlier in their disease trajectory, and for a longer period of time, compared to patients with breathlessness due to cancer.[11] This longevity could result in a greater burden of the symptom, resulting in a worse respiratory HRQoL. Secondly, experience of breathlessness in cancer is more episodic than in COPD.[12] Patients with cancer may, therefore, spend less time experiencing breathlessness and experience times of respite from the symptom, resulting in a lesser overall breathlessness burden, and, therefore, better respiratory HRQoL. Thirdly, it is possible that the threshold for referring patients with advanced COPD to specialist palliative support is higher than for those with advanced cancer.

These findings have implications for both clinical and research practice. The clinical implication relates to access to palliative care in patients with advanced COPD. It has been established that access to palliative care is poor for these patients compared to those with cancer, despite studies indicating that patients with advanced COPD have an equal or greater symptom burden than patients with cancer.[11, 13-15] Our data confirms their poorer respiratory HRQoL, suggesting the need for major improvements in access to palliative support for these patients.

The research implication relates to whether the CRQ-Original should be validated as an appropriate tool to assess respiratory HRQoL in patients with cancer. Our data suggest that the CRQ-Original is sensitive to detecting differences in respiratory HRQoL between patients with advanced COPD and cancer, increasing its potential for use in this diagnostic group. If found to be valid, this would provide a single tool that could be used across disease groups, which would be advantageous in palliative care research across malignant and non-malignant disease. Formal psychometric testing of the CRQ in advanced cancer may therefore be warranted. In tandem to this, given the short nature of the CRQ (its self-administered versions in particular), its validation across malignant and non-malignant disease could have utility for clinical practice.

CONCLUSION

Acknowledging that patients with advanced COPD experience breathlessness differently from those with cancer is imperative if we are to direct our interventions effectively and improve access to palliative care for patients with advanced COPD. Further, formal psychometric testing of the CRQ in patients with respiratory symptoms due to cancer may be warranted to establish its suitability for use in this group, which could benefit both research and clinical practice.

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