Published in final edited form as:

J Med Ethics. 2008 September ; 34(9): 664–668. doi:10.1136/jme.2007.022731.

Decision-making in patients with advanced cancer compared with amyotrophic lateral sclerosis

A B Astrow^{1,2,3}, J R Sood^{2,3}, M T Nolan⁴, P B Terry⁴, L Clawson⁴, J Kub⁴, M Hughes⁴, and D P Sulmasy^{2,3}

¹ Maimonides Medical Center, Brooklyn, New York, USA

² St Vincent's Hospital Manhattan, New York, New York, USA

³ New York Medical College, Valhalla, New York, USA

⁴ The Johns Hopkins Medical Institutions, Baltimore, Maryland, USA

Abstract

Aim: Patients with advanced cancer need information about end-of-life treatment options in order to make informed decisions. Clinicians vary in the frequency with which they initiate these discussions.

Patients and methods: As part of a long-term longitudinal study, patients with an expected 2-year survival of less than 50% who had advanced gastrointestinal or lung cancer or amyotrophic lateral sclerosis (ALS) were interviewed. Each patient's medical record was reviewed at enrollment and at 3 months for evidence of the discussion of patient wishes concerning ventilator support, artificial nutrition and hydration (ANH), resuscitation (DNR) and hospice care. A Kaplan–Meier analysis was also performed and 2-year survival calculated.

Results: 60 cancer and 32 ALS patients were enrolled. ALS patients were more likely than cancer patients to have evidence of discussion about their wishes for ventilator support (31% vs 0%, $p < 0.001$), ANH (38% vs 0%, $p < 0.001$), DNR (25% vs 0%, $p < 0.001$) and hospice care (22% vs 5%, $p = 0.03$). At 6 months, 91% of ALS patients were alive compared with 62% of cancer patients; at 2 years, 63% of ALS patients were alive compared with 23% of cancer patients ($p < 0.001$).

Conclusions: Cancer patients were less likely than ALS patients to have had documented advanced care planning discussions despite worse survival. This may reflect perceptions that ALS has a more predictable course, that advanced cancer has a greater number of treatment options, or differing views about hope. Nevertheless, cancer patients may be less adequately prepared for end-of-life decision-making.

Patients with short life expectancy as a result of diseases such as cancer and amyotrophic lateral sclerosis (ALS) need information about end-of-life care options in order to make informed decisions about medical interventions such as ventilator support, artificial nutrition and hydration (ANH), resuscitation (“do not resuscitate”; DNR) and hospice care.¹ Doctors, patients and families, however, may avoid these discussions. ALS has a relatively predictable downhill course and limited treatment options. Cancers range widely in their prognoses and

Correspondence to: Dr D P Sulmasy, Saint Vincent Catholic Medical Centers Manhattan, Department of Ethics, 153 West 11th Street, NR 817, New York, NY 10011, USA; daniel_sulmasy@nymc.edu.

Competing interests: None.

Ethics approval: The study was approved by the institutional review boards at the Johns Hopkins Medical Institutions in Baltimore, Maryland and St Vincent's Hospital Manhattan.

responses to treatment. Most cancer patients want detailed prognostic information and want to be informed if their illness is terminal, but they want information presented in an individualised manner that allows for hope.²³

Reflecting differences in biology, therapeutic options and popular perceptions, the rates of documented discussion of end-of-life care options ("advance care planning")⁴ may vary depending upon the patient's diagnosis. One study retrospectively examined the charts of elderly patients with advanced cancer to determine the proportion who had a documented discussion of prognosis. The study found that only a minority of patients, 38%, had documentation and that such documentation was associated with the discussion of life-sustaining treatments.⁵ The current study involves a comparison of prospectively identified adult advanced cancer patients with patients suffering from a different incurable illness, ALS, and includes a review of outpatient as well as inpatient records. The purpose was to determine whether the rate of discussion of end-of-life care options differed in advanced cancer patients compared with ALS patients. The study was part of a larger longitudinal study of decision control preferences in end-of-life care.

PATIENTS AND METHODS

Sample

This study was a part of larger 2-year longitudinal study looking at patient's control preferences for decisions at the end of life.⁶ The study institutions were the Johns Hopkins Medical Institutions in Baltimore, Maryland and St Vincent's Hospital Manhattan. Patients who met the study criteria and were being treated as either inpatients or outpatients by medical specialists at one of the two study institutions were referred to the investigators. Patient interviews and medical record review took place between April 2000 and June 2004. Inclusion criteria were: at least 18 years of age, English or Spanish speaking and interviewed within 8 weeks of being diagnosed with ALS or advanced cancer. Cancer patients included those with unresectable non-small cell lung cancer or stage III or IV pancreatic, or stage IV liver, colon or gastric cancer. These criteria were selected to obtain a sample of patients with a prognosis of at least 50% 2-year mortality based on the literature and the clinical experience of the respective medical specialists at the two study sites. Initial interviews took place within one month of diagnosis. Patients were screened and excluded for altered mental status using the short portable mental status questionnaire⁷ and the confusion assessment method.⁸ Informed consent was obtained from all patients and the study was approved by the institutional review boards at both institutions.

Of the 207 patients deemed eligible for the study, 81 (39%) refused. An additional 25 patients could not be reached within the one-month time frame, one patient was cognitively incapable, four died before they could be approached and families prevented us from contacting four patients. Participants did not differ from non-participants in diagnosis ($p = 0.43$), sex ($p = 0.21$), race ($p = 0.37$) or age ($p = 0.53$).

Instruments

We performed a medical record review at baseline (within 2 months of diagnosis) and again 3 months and 6 months later. Records were reviewed by a single registered nurse at each time point. At baseline we collected sociodemographic information including patient gender, race, maximum level of education, marital status, religion, type of health insurance and age. We looked for documentation of the discussion of patient wishes concerning ventilator support, ANH, DNR and hospice care at baseline, at 3 months and at 6 months. In addition, we assessed quality of life using the McGill quality of life questionnaire⁹ and health status using the general health questionnaire¹⁰ at the initial patient interview after diagnosis.

Six weeks after the patient's death, up to three attempts were made by telephone over a 2-week period to contact the patient's closest relative to conduct an interview regarding end-of-life decisions that had actually been made.

Data analysis

We compared ALS and cancer patients' demographic characteristics and the cumulative prevalence of documented discussion of patient wishes concerning ventilator support, ANH, DNR and hospice care using the Fisher's or the χ^2 tests. We also performed a Kaplan-Meier analysis and calculated 2-year survival. All analyses were performed using the SPSS statistical software package.

RESULTS

Ninety-two patients (60 cancer, 32 ALS) were surveyed. Patient characteristics are shown in table 1. Comparing cancer patients with ALS patients there were no significant differences in age, sex, education, quality of life by total McGill score or health status by total general health questionnaire score. The ALS patients were more likely to be white (94% vs 71%), to attend religious services at least once a week (63% vs 37%) and to be married (78% vs 38%). There were six Spanish-speaking patients but only one preferred that the interviews be conducted in Spanish.

Overall, 47% of eligible patients participated in the study, with 36% refusing and 17% not participating because of other reasons such as death or inability to be reached within 8 weeks of diagnosis. There were no significant differences between participants and non-participants with regard to race ($p = 0.11$), sex ($p = 0.30$), diagnosis ($p = 0.48$), age ($p = 0.63$) or study site ($p = 0.31$).

As shown in table 2, 3 and 6 months after diagnosis, ALS patients were significantly more likely to have documentation of the discussion of end-of-life treatment options: 31% of ALS patients had documentation of the discussion of ventilator support at 3 months and 56% at 6 months compared with 0% of cancer patients at both time points; 38% of ALS patients had documented discussion of ANH at 3 months and 56% at 6 months compared with 0% of cancer patients at both time points; 25% of ALS patients had documented discussion of DNR at 3 months and 41% at 6 months compared with 0% of cancer patients at both time points; 22% of ALS patients had documented discussion of hospice care at 3 months and 24% at 6 months compared with 3% of cancer patients at both time points.

On univariate analysis, sociodemographic variables, including health insurance, age, race, sex, education, religion, health status and quality of life were unassociated with the likelihood of the documented discussion of ventilator support, ANH, DNR or hospice care.

Survival was significantly better in this group of ALS patients than in the cancer patients (fig 1).

One month after death, we were able to interview 36 family members about the care their loved ones actually received at the end of life. For those family members for whom we have data regarding resuscitation status ($N = 33$), all but two of 26 cancer patients and all but one of seven ALS patients had DNR orders in place before death. Of the 24 cancer patients with DNR orders, however, six nonetheless received cardiopulmonary resuscitation, whereas none of the ALS patients with DNR orders received cardiopulmonary resuscitation. Given the small numbers these results did not reach statistical significance.

DISCUSSION

Cancer patients need to be given information about end-of-life treatment options in a timely manner if they are to be able to participate in decision-making.¹¹ Advance care planning often follows upon the discussion of prognosis and oncologists are sometimes reluctant to initiate such discussions.¹¹⁻¹³ Previous studies have shown that the discussion of issues such as DNR frequently take place late in the course of an illness,¹⁴ that among terminally ill patients with cancer, discussions about prognosis as documented in medical charts are infrequent and limited in scope^{5,15} and that chemotherapy is used frequently in the last 3 months of life even in patients with cancers unresponsive to chemotherapy.¹⁶ Most cancer patients want their doctors to be realistic and to give detailed information about prognosis, although they also prefer that such information be conveyed through individualised discussion with a doctor with whom they have had previous contact, delivered in a confident, collaborative and supportive manner.² 17-21

Among the 62 patients in our study with advanced lung or gastrointestinal cancer, there was almost no documented discussion of patient wishes concerning ventilator support, ANH, DNR or hospice care. Most of the 26 cancer patients for whom we have family member interview data did have DNR orders in place at the time of death, but as there is no record of DNR discussion at baseline, or at regularly scheduled follow-up visits, our findings suggest that DNR discussion took place with the patient's condition deteriorating, perhaps during hospitalisation, immediately before the patient's death. Although it might be argued that advance care planning discussions are not appropriate or desired immediately upon the diagnosis of incurable disease, our findings concerning cancer patients were similar at baseline and at 3 and 6 months follow-up. This was a group of cancer patients with an extremely poor prognosis. Although they were selected for the study because their estimated 2-year mortality was 50% or greater, most cancer patients died within one year of entry into the study.

Our findings add to previous studies by showing that the paucity of discussion is not limited to elderly patients,⁵ and that it is not only a patient's poor prognosis but also a diagnosis of cancer that is associated with less frank discussion. Compared with the ALS patients in the study, who had a significantly better survival than the cancer patients, there was significantly less documented discussion of end-of-life care with the cancer patients. This is consistent with a recent report that patients with advanced cancer are often not fully informed about alternatives to active treatment.²²

Possible reasons for the differences between cancer patients and ALS patients in the discussion of end-of-life issues include more variability in prognosis in cancer patients compared with ALS, which has a relatively predictable and inexorable decline towards death.²³ There are relatively few therapeutic options for ALS compared with cancer, which may prompt more attention to end-of-life concerns early in the course of the illness. With cancer there may be the perception of more treatment options, such that discussions between the oncologist and cancer patient may focus more on these acute care treatment possibilities, even when the prognosis is poor and the likelihood of benefit small.²⁴ In addition, the discussion of such issues as wishes concerning ventilator support or ANH might be seen as more pressing for ALS patients in whom progressive weakness requires that these issues be addressed with virtually all patients at some point in their illness trajectory. The standard of care among specialists who treat persons with ALS is to initiate these discussions. A 1999 report of the Quality Standards Subcommittee of the American Academy of Neurology on the care of the patient with ALS recommended that the doctor consider initiating a discussion of advance directives well in advance of the terminal phase, including options regarding long-term ventilation and hospice care.²⁵ Data on the care of 1014 persons with ALS treated at ALS

centres of excellence in the United States and Canada reported that advance directives were in place for 88.9% of the patients at the time of their death.²⁶

Some cancer patients prefer not to have frank discussions with their oncologist about prognosis.³²⁷⁻³⁰ In the face of uncertainty about the patient's wishes for frank discussion, the oncologist may evade the issue, for fear of depriving the patient of hope.³¹ One recent study of patients with advanced breast cancer found that hope was the single main reason patients chose to receive second-line chemotherapy.³² Oncologists nevertheless have an obligation both to be honest with their patients and also to "promote reasonable hopefulness".³³ Lack of training in communications skills may leave the oncologist poorly prepared to attain that balance and so difficult discussions may be avoided.³⁴⁻³⁶

Our study has several limitations. This was a relatively small group of cancer patients from only two sites in the northeastern United States. The results may not be generalisable to other institutions or regions. Another limitation of this study is its chart review methodology. Although it is possible that the standard of care for treating persons with ALS among neurologists differentially encouraged the documentation of advance care planning discussions so that we overestimated the magnitude of any real differences in discussion rates between cancer patients and ALS patients, differential inattention by oncologists to the recording of these conversations would itself raise concerns about the quality of care. Some may worry that a lack of documentation of advance care planning in the chart does not mean that it did not occur. It has been demonstrated, however, at least in the inpatient setting, that a lack of documentation of plans about specific aspects of end-of-life care in the chart validly reflects the understandings of those most closely affected by these decisions (the patients) as well as those who must carry out each plan for care at the end of life (nurses and house officers).³⁷ Finally, there were demographic differences between the cancer and ALS patients, but none of these demographic characteristics were associated with the outcome variables reflecting advance care planning.

There is scant published literature on how a patient's diagnosis influences the likelihood that end-of-life treatment options will be discussed. One retrospective study of teaching hospitals showed that patients with advanced lung cancer or AIDS were more likely to have DNR orders on their charts than patients with advanced cirrhosis or heart failure, despite similarly poor prognoses among the groups.³⁸ That study, published in 1989, did not address when in the course of the illness the DNR order was written, how and with whom the issues were discussed, or any information regarding the discussion of other end-of-life care issues.

In summary, cancer patients in our study had almost no documented discussion of their wishes concerning ventilator support, ANH, DNR or hospice care either upon the diagnosis of incurable illness or at 3-month and 6-month follow-up and were significantly less likely to have had such discussions than ALS patient who had a significantly better survival. Cancer patients with poor prognoses may therefore be less adequately prepared for end-of-life decision-making than other patients with poor prognoses and may be forced to confront these difficult issues only when hospitalised and close to death. These findings should encourage both further study of the impact of diagnosis on end-of-life care and additional training of oncologists in end-of-life communications skills.

Acknowledgements

Funding: This study was funded by the National Institute of Nursing Research at the National Institutes of Health (1 R01 NR005224-01A1), by a grant from the Leslie R Samuels and Fan Fox Foundation (administered by the Partnership for Caring) and by the ALS Research Center of the Johns Hopkins University

REFERENCES

1. Martin DK, Emanuel LL, Singer PA. Planning for the end of life. *Lancet* 2000;356:1672–6. [PubMed: 11089839]
2. Hagerty RG, Butow PN, Ellis PM, et al. Communicating with realism and hope: incurable cancer patients' views on the disclosure of prognosis. *J Clin Oncol* 2005;23:1278–88. [PubMed: 15718326]
3. Blanchard CG, Labrecque MS, Ruckdeschel JC, et al. Information and decision-making preferences of hospitalized adult cancer patients. *Soc Sci Med* 1988;27:1139–45. [PubMed: 3206248]
4. Teno JM, Nelson HL, Lynn J. Advance care planning: priorities for ethical and empirical research. *Hastings Cent Rep* 1994;24:S32–6. [PubMed: 7860278]
5. Bradley EH, Hallemeyer AG, Fried TR, et al. Documentation of discussions about prognosis with terminally ill patients. *Am J Med* 2001;111:218–23. [PubMed: 11530033]
6. Sulmasy DP, Hughes MT, Thompson RE, et al. How would terminally ill patients have others make decisions for them in the event of decisional incapacity? A longitudinal study. *J Am Geriatr Soc* 2007;55:1981–8. [PubMed: 18031490]
7. Pfeiffer E. A short portable mental status questionnaire for the assessment of organic brain deficit in elderly patients. *J Am Geriatr Soc* 1975;23:433–41. [PubMed: 1159263]
8. Inouye SK, van Dyck CH, Alessi CA, et al. Clarifying confusion: the confusion assessment method. A new method for detection of delirium. *Ann Intern Med* 1990;113:941–8. [PubMed: 2240918]
9. Cohen SR, Mount BM, Strobel MG, et al. The McGill quality of life questionnaire: a measure of quality of life appropriate for people with advanced disease. A preliminary study of validity and acceptability. *Palliat Med* 1995;9:207–19. [PubMed: 7582177]
10. Goldberg DP, Hillier VF. A scaled version of the general health questionnaire. *Psychol Med* 1979;9:139–45. [PubMed: 424481]
11. Annas GJ. Informed consent, cancer, and truth in prognosis. *N Engl J Med* 1994;330:223–5. [PubMed: 8264766]
12. Gordon EJ, Daugherty CK. “Hitting you over the head”: oncologists disclosure of prognosis to advanced cancer patients. *Bioethics* 2003;17:142–68. [PubMed: 12812182]
13. Miyaji NT. The power of compassion: truth-telling among American doctors in the care of dying patients. *Soc Sci Med* 1993;36:249–64. [PubMed: 8426968]
14. SUPPORT Principal Investigators. A controlled trial to improve care for seriously ill hospitalized patients. *JAMA* 1995;274:1592–8.
15. Bradley EH, Hallemeyer AG, Fried TR, et al. Documentation of discussions about prognosis with terminally ill patients. *Am J Med* 2001;111:218–23. [PubMed: 11530033]
16. Emanuel EJ, Young-Xu Y, Levinsky NG. Chemotherapy use among Medicare beneficiaries at the end of life. *Ann Intern Med* 2003;138:639–43. [PubMed: 12693886]
17. Sardell AN, Trierweiler SJ. Disclosing the cancer diagnosis: procedures that influence patient hopefulness. *Cancer* 1993;72:3355–65. [PubMed: 8242563]
18. Hagerty RG, Butow PN, Ellis PA, et al. Cancer patient preferences for communication of prognosis in the metastatic setting. *J Clin Oncol* 2004;22:1721–30. [PubMed: 15117995]
19. Yun YH, Lee GL, Kim S, et al. The attitude of cancer patients and their families toward the disclosure of terminal illness. *J Clin Oncol* 2004;22:204–314. [PubMed: 14701790]
20. Pentz RD, Lenzi R, Holmes F, et al. Discussion of the do-not-resuscitate order: a pilot study of perceptions of patients with refractory cancer. *Support Care Cancer* 2002;10:573–8. [PubMed: 12436216]
21. Parker PA, Baile WF, deMoor C, et al. Breaking bad news about cancer: patient preferences for communication. *J Clin Oncol* 2001;19:2049–56. [PubMed: 11283138]
22. Tattersall MH, Gattellari M, Voigt K, et al. When the treatment goal is not cure: are patients informed adequately? *Support Care Cancer* 2002;10:314–21. [PubMed: 12029431]
23. Benditt JO, Smith TS, Tonelli MR. Empowering the individual with ALS at the end-of-life: disease-specific advance care planning. *Muscle Nerve* 2001;1706–9. [PubMed: 11745983]
24. Good MD, Good BJ, Schaffer C, et al. American oncology and the discourse on hope. *Cult Med Psychiatry* 1990;14:59–79. [PubMed: 2340733]

25. Miller RG, Rosenberg JA, Gelinas DF, et al. Practice parameter: the care of the patient with amyotrophic lateral sclerosis (an evidence-based review): report of the Quality Standards Subcommittee of the American Academy of Neurology: ALS Practice Parameters Task Force. *Neurology* 1999;52:1311–23. [PubMed: 10227612]
26. Mandler RN, Anderson FA Jr, Miller RG, et al. The ALS Patient Care Database: insights into end-of-life care in ALS. *Amyotroph Lateral Scler Other Motor Neuron Disord* 2001;2:203–8. [PubMed: 11958732]
27. Leydon GM, Boulton M, Moynihan C, et al. Cancer patients' information needs and information seeking behavior: in depth interview study. *BMJ* 2000;320:909–13. [PubMed: 10742000]
28. Chochinov HM, Tataryn DJ, Wilson KG, et al. Prognostic awareness and the terminally ill. *Psychosomatics* 2000;41:500–4. [PubMed: 11110113]
29. The A, Hak T, Koeter G, et al. Collusion in doctor–patient communication about imminent death: an ethnographic study. *BMJ* 2000;321:1376–81. [PubMed: 11099281]
30. Rousseau P. Death denial. *J Clin Oncol* 2003;21(9 Suppl):52s–3s. [PubMed: 12743193]
31. Hancock K, Clayton JM, Parker SM, et al. Truth-telling in discussing prognosis in advanced life-limiting illnesses: a systematic review. *Palliat Med* 2007;21:507–17. [PubMed: 17846091]
32. Grunfeld EA, Maher J, Browne S, et al. Advanced breast cancer patients' perceptions of decision making for palliative chemotherapy. *J Clin Oncol* 2006;24:1090–8. [PubMed: 16505428]
33. Kadish E, Post SG. Oncology and hope. *J Clin Oncol* 1995;13:1817–22. [PubMed: 7602370]
34. Arora NK. Interacting with cancer patients: the significance of physicians' communication behavior. *Soc Sci Med* 2003;57:791–806. [PubMed: 12850107]
35. Baile WF, Lenzi R, Kudelka AP, et al. Improving physician–patient communication in cancer care: outcome of a workshop for oncologists. *J Cancer Educ* 1997;12:166–73. [PubMed: 9376255]
36. Moynihan TJ, Schapira L. Preparing ourselves, our trainees, and our patients: a commentary on truth-telling. *J Clin Oncol* 2007;25:456–7. [PubMed: 17264346]
37. Sulmasy DP, Marx ES, Dwyer M. Do the ward notes reflect the quality of end-of-life care? *J Med Ethics* 1996;22:344–8. [PubMed: 8961119]
38. Wachter RM, Luce JM, Hearst N, et al. Decisions about resuscitation: inequities among patients with different diseases but similar prognoses. *Ann Intern Med* 1989;111:525–32. [PubMed: 2549825]

Figure 1. Kaplan–Meier survival in the 32 amyotrophic lateral sclerosis patients is superior to that in the 60 advanced cancer patients ($p<0.001$). ALS, amyotrophic lateral sclerosis.

Table 1

Characteristics of the sample (N = 92) by diagnosis

Variable	Cancer patients (N = 60)	ALS patients (N = 32)	p Value (by t-test or χ^2)
	Mean or N (%)	Mean or N (%)	
Mean age, years	61.9 $\pm$ 12.8	62.4 $\pm$ 11.5	0.85
Age by category, years			0.78
<50	10 (17)	4 (13)	
50–59	17 (30)	10 (31)	
60–69	10 (17)	8 (25)	
≥ 70	21 (36)	10 (31)	
Gender			0.61
Male	37 (62)	18 (56)	
Female	23 (38)	14 (44)	
Race			0.01 *
White	42 (71.2)	30 (93.8)	
Non-white	17 (28.8)	2 (6.3)	
Race II			0.06
White	41 (69.5)	30 (93.8)	
Hispanic	5 (8.5)	1 (3.1)	
African American/black	10 (16.9)	1 (3.1)	
Other	3 (5.1)	0	
Education			1.00
High school or less	35 (58.3)	18 (56.3)	
College +	25 (41.7)	14 (43.8)	
Marital status			<0.001 **
Married	23 (38.3)	25 (78.1)	
Not married	37 (61.7)	7 (21.9)	
Health insurance			0.05
Medicaid/none	13 (22.0)	14 (43.8)	
Private/Medicare	46 (78.0)	18 (56.3)	
Religion			0.53
Christian	50 (84.7)	29 (90.6)	
Non-christian, none	9 (15.3)	3 (9.4)	
Religiosity (attendance at religious service)			0.03 *
< Once a week	37 (62.7)	12 (37.5)	
$\geq$ Once a week	22 (37.3)	20 (62.5)	
McGill quality of life total score	7.23 $\pm$ 1.60	7.28 $\pm$ 1.52	0.12
General health questionnaire total score	26.63 $\pm$ 14.82	22.38 $\pm$ 12.28	0.17

ALS, amyotrophic lateral sclerosis.

*
p<0.05**
p<0.01.

Table 2

Cumulative percentage of charts documenting discussion of end-of-life treatment options by 3 and 6 months from baseline

Variable	Cancer patients (N = 59) (%)	ALS patients (N = 32) (%)	p Value *
Ventilator support 3 months	0 (0.0)	10 (31.3)	<0.001
Discussion 6 months	0 (0.0)	18 (56.3)	<0.001
ANH 3 months	0 (0.0)	12 (37.5)	<0.001
Discussion 6 months	0 (0.0)	18 (56.3)	<0.001
Resuscitation 3 months	0 (0.0)	8 (25.0)	<0.001
Discussion 6 months	0 (0.0)	13 (40.6)	<0.001
Hospice 3 months	2 (3.4)	7 (21.9)	0.01
Discussion 6 months	2 (3.4)	8 (24.0)	0.003

ALS, amyotrophic lateral sclerosis; ANH, artificial nutrition and hydration.

* By χ^2 or Fisher's exact test.