Published in final edited form as:

Neurocrit Care. 2017 October ; 27(2): 180–186. doi:10.1007/s12028-016-0358-3.

Anxiety and Depressive Symptoms Among Two Seriously Medically-Ill Populations and their Family Caregivers: A Comparison and Clinical Implications

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Abstract

Purpose—Anxiety and depression are common among patients with acute illness and their families. In oncology, psychosocial services addressing these symptoms are increasingly part of regular practice. Less is known about psychiatric distress among patients with acute neurological injury (ANI) and their family caregivers. To highlight this inequity in psychosocial intervention across medical services, we compared anxiety and depressive symptomatology shortly following diagnosis among patients facing incurable cancer or ANI and their family caregivers.

Methods—Recruited from the same hospital, participants were patients within 8 weeks of receiving a diagnosis of incurable cancer ($N=350$) and their family caregivers ($N=275$; total patient/caregiver dyads=275) and patients hospitalized in the Neuroscience-ICU in the past 2 weeks ($N=81$) and their family caregivers ($N=95$; total dyads=75). Participants reported anxiety and depressive symptoms using the Hospital Anxiety and Depression Scale. Symptomatology was compared across illnesses using independent samples t -tests and multiple regressions controlling for differences in sample demographics.

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DISCLOSURES

This work was performed at the Massachusetts General Hospital, Boston, MA.

Conflict of Interest: The authors declare that they have no conflict of interest.

ETHICAL APPROVAL AND INFORMED CONSENT

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. Informed consent was obtained from all individual participants included in the study.

Results—Patients with ANI ($M=6.90$) reported greater anxiety symptoms than those with cancer ($M=5.31$, $p<.001$), while caregivers for patients with ANI ($M=5.45$) reported greater depressive symptoms than caregivers for patients with cancer ($M=3.81$, $p<.001$). Results remained when controlling for demographic differences between samples.

Conclusion—This is the first cross-comparison of psychiatric distress in patients and family caregivers affected by two distinct, life-threatening illnesses early in the illness trajectory. Findings support the priority of addressing psychiatric distress among patients with ANI and their family caregivers, as has been emphasized in the psychosocial oncology field.

Keywords

anxiety; depression; family caregiver; incurable cancer; neuroscience ICU; psychosocial intervention

INTRODUCTION

Symptoms of anxiety and depression are common among people experiencing life-threatening medical illness [1–5]. Higher frequency and intensity of these symptoms are associated with worse quality of life and treatment adherence, and increased mortality [6–9]. Those experiencing the greatest distress early in their disease trajectory tend to show chronically elevated distress months to years later [7, 10], yet few studies have documented distress in the days or weeks following the initial shock of diagnosis with a serious, life-threatening illness. Given that distress is treatable through evidence-based interventions [11, 12], early assessment and management of psychiatric distress among medically-ill patients has become a priority in psychosocial research and clinical care [6].

Family members and friends are also affected by their loved one's medical illness, both by existential worries about the possible loss and by their new role as family caregivers, providing support to the patient across their illness trajectory. While most interventions are designed to address patient distress, family caregivers also report substantial psychiatric distress, with caregivers sometimes described as “the hidden patient” [13]. Caregivers' anxiety and depressive symptoms interfere with their ability to provide high-quality care to the patient [14], and are also associated with their own risk for disease development [15, 16] and mortality [17]. As a result, early assessment and management of caregivers' distress has also become a clinical priority, yet remains rare in practice [18, 19].

Extensive literature documents psychiatric distress among both patients with cancer and increasingly their family caregivers, which has provided the evidence necessary to implement psychosocial screening, referral, and intervention into care standards for patients [20–22] and research priorities among caregivers [19]. Psychosocial screening programs and supportive interventions integrated into oncology care are seen as critical to achieving patient- and family-centered care [23], and have shown to improve outcomes ranging from patient-provider communication [24] to prolonged survival and quality of life among patients at end of life [25]. Psychosocial distress has more recently become an area of research interest among patients who face acute neurological injury (ANI), such as stroke or traumatic brain injury, and their families, with these populations reporting high levels of

depression, anxiety, post-traumatic stress, and generalized distress [5, 26–28]. Integration of psychiatric distress screening and intervention among patients admitted to Neuro-ICUs and their family caregivers remains limited.

To highlight this inequity in psychosocial assessment and intervention across medical services, we compared anxiety and depressive symptomatology shortly following diagnosis among patients facing incurable cancer and ANI and their family caregivers. We expected that our samples of patients with incurable cancer and ANI and their family caregivers would be relatively demographically comparable given recruitment from one hospital. We hypothesized that, given that both types of diagnoses are life-threatening and typically require complex and invasive treatments, anxiety and depressive symptoms would also be comparable between the samples facing incurable cancer and ANI. Findings hold implication for arguing for extension of psychosocial assessment and intervention into the Neuroscience ICU, as has been shown successful among oncology practice.

METHODS

Data were used from the baseline measures of two separate research studies conducted at the Massachusetts General Hospital (MGH) to compare anxiety and depressive symptoms across samples facing incurable cancer and acute neurological injury (ANI). Both studies collected demographic, medical, and psychiatric measures from patients and the patients' self-identified primary family caregiver.

Sample and setting

Incurable cancer—Data were baseline measures from a non-blinded, randomized, controlled trial of early palliative care integrated with standard oncology care compared with standard oncology care alone ([ClinicalTrials.gov](https://clinicaltrials.gov/ct2/show/study/NCT02349412) Identifier: NCT02349412). Participants were enrolled from May 2011 to July 2015 from the Massachusetts General Hospital (MGH) Cancer Center. The study was approved by the Dana-Farber/Harvard Cancer Center Institutional Review Board.

Patients were identified through electronic health record review of outpatient thoracic and GI oncology clinics; eligible patients were invited to participate by their oncology clinicians. Patients were eligible if they: (1) were within 8 weeks of diagnosis of lung (non-small cell, small cell, mesothelioma) or non-colorectal GI (pancreatic, hepatobiliary, esophageal, gastric) cancer being treated with non-curative intent; (2) received no prior treatment for metastatic disease; and (3) had an Eastern Cooperative Oncology Group (ECOG) status ≤ 2 . Patients were ineligible if they were already engaged in palliative care or if their oncologist believed the patient required palliative care or hospice. Enrolled patients identified family caregivers as a relative/friend who provided the majority of their unpaid care. One caregiver per patient was permitted to enroll per each participating patient. Both patients and caregivers were also: (1) fluent in English and (2) aged ≥ 18 years.

ANI—Data were baseline measures of an observational study of patients admitted to the Neuro-ICU and their family caregivers. Participants were enrolled from June to December

2015 from the MGH Neuro-ICU. This study was approved by the MGH Institutional Review Board.

Patients were eligible if they were admitted to the Neuroscience ICU (Neuro-ICU) within the past 2 weeks (e.g., with stroke, brain tumor). All patients were first cleared for participation in the consent process by the medical team. Patients were ineligible if they were unable to consent due to any medical (e.g., critical illness likely to result in death within the ICU), or cognitive factors (e.g., chronic aphasia) based on the clinical judgment of the medical team. Patients with transient aphasia or delirium who were asymptomatic at the time of consent were eligible to participate. The decision to use clinical judgment of the medical team rather than the use of specific questionnaires or cognitive test was predicated on using a criterion that is feasible, efficient, does not add burden to study participants, and can be easily employed in regular clinical practice. Patients identified family caregivers as a relative/friend who provided the majority of their unpaid care. Only one caregiver per patient was permitted to enroll; caregivers were eligible regardless of whether the nominating patient participated. Both patients and caregivers were also: (1) fluent in English and (2) aged ≥ 18 years.

Design

Incurable cancer—Patients who presented to the outpatient thoracic and GI oncology clinics were screened by research staff for study eligibility criteria using the electronic health record. The treating oncology clinicians invited eligible patients to participate in the study during the patients' clinic visits. Research staff invited caregivers identified by enrolled patients either in clinic or by telephone.

All who agreed to participate provided written informed consent at enrollment. Patients completed measures prior to randomization. Caregivers completed measures within one month of patient enrollment. Participants completed a demographic form and psychosocial questionnaires via either paper questionnaires or electronically with Research Electronic Data Capture (REDCap), a HIPAA compliant, web-based survey tool.

ANI—A research assistant (RA) rounded in the Neuro-ICU 2 days per week and identified dyads of patients and their caregivers. The RA approached eligible and medically cleared patients and their primary caregiver to discuss the study. Enrollment, inclusionary criteria review, and questionnaire completion occurred at the bedside (all Neuro-ICU rooms were single-patient rooms). When a patient met the eligibility criteria for the study but the caregiver was not present at the patient's bedside, the RA explained the study to the caregiver at a different time. If the patient was unable to complete the questionnaire at the time of enrollment, the RA followed the progress of the patient and re-approached the patient when appropriate. In some cases ($N=6$), the patient was never able to complete the questionnaire, so only the caregiver provided data.

All who agreed to participate provided written informed consent at enrollment. Patients and caregivers completed measures within 2 weeks of the patients' admission to the Neuro-ICU. Participants completed a demographic form and psychosocial questionnaires via either paper questionnaires or electronically with REDCap.

Measures

Demographic characteristics—Patient and caregiver characteristics were assessed via self-report and electronic medical review and included age, gender, race, ethnicity, level of education, and relationship type between the patient and caregiver.

Hospital Anxiety and Depression Scale (HADS)—Symptoms of anxiety and depression were measured with the HADS [29]. The 14 items are scored using a 4-point Likert scale (0 *Not at all/Very rarely* to 3 *All of the time/Very often*). Separate scores for anxiety (7 items) and depression (7 items) are computed by summing the respective items, with higher scores (range 0–21) indicating worse symptom severity.

Statistical analysis

Measures of central tendency (means and standard deviations or proportions) were used to describe patient and caregiver demographic characteristics. Sample demographics were compared across illness by patient-caregiver role using chi-square or independent *t*-tests, as appropriate. Where the frequencies per cell violated assumptions for chi-square tests, factors were either dichotomized (race [white vs. non-white] and relationship factors [spouse/partner vs. other]) or not statistically compared across samples (ethnicity).

Correlation between patient and caregiver symptom scores was tested using Pearson's *r* correlations. Mean symptom scores were compared across illness by patient-caregiver role using independent samples *t*-tests, as well as multiple regression to adjust for demographic characteristics that differed across samples. For patients, regression analyses adjusted for age, race (white vs. non-white), and level of education (high school or less vs. some college or more). For caregivers, regression analyses adjusted for age and race (white vs. non-white). Small, medium, and large effect sizes were distinguished by Pearson's *r*s=0.10, 0.30, and 0.50 and Cohen's *d*s=0.20, 0.50, and 0.80, respectively [30]. Analyses were completed using SPSS version 20 [31]. Significance testing used $\alpha=.05$, two-tailed tests.

RESULTS

Descriptive characteristics for the samples are shown in Table 1 for the incurable cancer sample (total *N*s patients=350, caregivers=275, full dyad=275) and the ANI sample (total *N*s patients=81, caregivers=94, full dyad=75). Patients and caregivers participating without a corresponding caregiver or patient, respectively, did not differ on any demographic variable or on levels of anxiety or depressive symptoms reported ($p>.06$). Therefore, data from all patients and caregivers were included in relevant analyses to increase generalizability.

Patients with incurable cancer were 8 years older than patients with ANI on average. The ANI patient sample was more racially diverse and more highly educated relative to the incurable cancer sample. Caregivers for patients with incurable cancer were 3 years older than caregivers for patients with ANI on average. The ANI caregiver sample was more racially diverse relative to the incurable cancer sample. Samples were otherwise comparable demographically.

Anxiety symptoms

Greater anxiety symptoms among patients with incurable cancer were related to greater anxiety symptoms among their caregivers (see Table 2, small effect); there was no association between patients' and their caregivers' anxiety symptoms in the ANI sample. Patients with ANI reported greater anxiety symptoms compared to patients with incurable cancer ($d=0.34$, small effect). Adjusting for covariates, patients with ANI reported mean anxiety symptom scores 1.53 points higher than patients with incurable cancer. There was no difference in anxiety symptom severity between caregivers for patients with incurable cancer or ANI.

Depressive symptoms

Greater depressive symptoms among patients were related to greater depressive symptoms among caregivers for both samples (see Table 2, small effects). There was no difference in depressive symptom severity between patients with incurable cancer and ANI. For caregivers, those caring for patients with ANI reported greater depressive symptoms than those caring for patients with incurable cancer ($d=0.42$, small-to-medium effect). Adjusting for covariates, caregivers for patients with ANI reported mean depressive symptom scores 1.37 points higher than caregivers for patients with incurable cancer.

DISCUSSION

In this first cross-comparison of patients and family caregivers affected by recent diagnosis of incurable cancer or ANI, patients with ANI reported greater anxiety symptoms than those with cancer, while the caregivers for patients with ANI reported greater depressive symptoms relative to those caring for patients with cancer. Findings support the priority of studying psychiatric distress among patients with ANI and their family caregivers and translating findings into empirically-based supportive interventions for these distressed populations, as has been a research priority in the psychosocial oncology field [19, 20].

There is a growing literature regarding anxiety and depression among patients with advanced or incurable cancer and their family caregivers. Less is known, however, regarding psychiatric distress in patients following ANI and their families. Our findings suggest that these populations facing ANI are highly distressed, even compared to persons affected by a recent incurable cancer diagnosis. The acute onset of illness from ANI and inpatient hospitalization experience may represent unique stressors for this population, versus the outpatient diagnostic process for those facing incurable cancer. Although both patient samples had life-threatening illness, patients with ANI experience immediate impairment, while patients with cancer experience greater debilitation as their treatment begins and illness progresses. These divergent illness trajectories also may have differential psychosocial associations with patients' family caregivers, in that caregivers for patients with ANI reported worse depressive symptoms severity compared to caregivers for patients with incurable cancer.

The oncology field has progressed substantially over the past several decades in terms of attending to the psychosocial needs of cancer patients and their families [32]. Given the high

psychosocial burdens of ANI to patients and their family caregivers even when compared to patients and families facing the most distressing cancer diagnoses, we encourage Neuro-ICUs to follow oncology's acceptance and integration of psychosocial care into standard practice. However, the success of psychosocial screening programs hinges on the follow-up with referral to effective treatments [24]. As few psychosocial interventions have been tested among patients with ANI and their caregivers, extension of existing, effective psychosocial interventions (such as short-term, skills-based, CBT-oriented interventions) [11, 12, 33] for these populations are warranted, even in the heavily medically-focused ICU.

Findings are limited in that data are cross-sectional and used a self-report questionnaire that is not diagnostic. However, the HADS is a widely-used psychiatric assessment tool and shows excellent sensitivity and specificity to clinical diagnosis among samples of patients with cancer or ANI and healthy persons [34–36], underscoring its validity and efficiency in clinical practice. We further acknowledge that the samples compared in the analyses had notable differences in terms of demographics (e.g., mean age) and medical stressors faced (e.g., inpatient versus outpatient treatment). We believe, however, that data presented provide a strong argument for the relevance and importance of psychiatric distress research, assessment, and intervention within intensive care neuroscience, as has been acknowledged in the field of oncology. Future studies may seek to determine risk factors for psychiatric symptoms that are shared versus unique across populations of severely medically-ill patients and their caregivers to promote development and tailoring of effective psychosocial distress assessment and treatment services.

In conclusion, this study is the first to compare anxiety and depressive symptom burden across patients and family caregivers affected by two distinct yet life-threatening illnesses at the outset of the illness trajectory. Recruited from the same hospital and relatively comparable demographically, patients admitted to the Neuro-ICU with ANI reported greater anxiety symptoms, and their caregivers reported greater depressive symptoms, relative to patients recently diagnosed with incurable cancer and their caregivers. Findings reinforce the priority of extending and tailoring psychosocial assessment and interventions to the acute stressors of the Neuro-ICU for both patients and family caregivers.

Acknowledgments

We thank Tara Tehan, Mary Guanci, Eric Riklin, and the nursing staff within the Neuroscience ICU for their help with recruitment for patients with Acute Neurological Injury. We thank the Cancer Outcomes Research team for their contributions to the Early Palliative Care study.

Funding: Funding information: Dr. Vranceanu received support from the National Institute of Neurological Disorders and Stroke Clinical Trials Methodology Course (5R25NS088248-02). Dr. Temel received support from the National Institute of Nursing Research (R01 NR012735) and National Cancer Institute (K24 CA181253).

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Table 1
Demographic and Medical Characteristics of Patients with Incurable Cancer or Acute Neurological Injury (ANI) and their Family Caregivers

	Cancer		ANI		Cancer compared to ANI	
	Patients (N=350)	Caregivers (N=275)	Patients (N=81)	Caregivers (N=95)	Patients - Patients	Caregivers - Caregivers
	M (SD) or N (%)	M (SD) or N (%)	M (SD) or N (%)	M (SD) or N (%)	t or χ^2 (df)	t or χ^2 (df)
Age	64.86 (10.86)	57.37 (13.61)	51.74 (16.78)	52.87 (14.02)	8.98(435)***	3.04(368)**
Gender (female)	161 (46.0%)	190 (69.1%)	39 (48.1%)	59 (62.1%)	0.15(1)	2.02(1)
Race					8.46(1)**	3.85(1)*
American Indian/Alaskan Native	4 (1.1%)	1 (0.4%)	1 (1.2%)	0 (0%)		
Asian	8 (2.3%)	8 (2.9%)	4 (4.9%)	3 (3.2%)		
African American/Black	10 (2.9%)	6 (2.2%)	3 (3.7%)	2 (2.1%)		
White	323 (92.3%)	256 (93.1%)	66 (81.5%)	82 (86.3%)		
Other/Multiracial	5 (1.4%)	4 (1.5%)	7 (8.6%)	7 (7.4%)		
Hispanic/Latino (endorsed)	9 (2.6%)	8 (2.9%)	3 (3.7%)	2 (2.1%)	–	–
Education					10.82(3)*	7.57(3)
High school degree	131 (37.4%)	73 (26.5%)	20 (24.7%)	19 (20.0%)		
Associate's/Technical degree/some college	79 (22.6%)	53 (19.3%)	19 (23.5%)	22 (23.2%)		
Bachelor's degree	66 (18.9%)	85 (30.9%)	28 (34.6%)	21 (22.1%)		
Graduate/Professional degree	74 (21.1%)	63 (22.9%)	14 (17.3%)	33 (34.7%)		
Diagnosis					–	–
Lung Cancer	191 (54.6%)	–	–	–		
Non-colorectal GI Cancer	159 (45.4%)	–	–	–		
Cerebrovascular (stroke/hemorrhage, brain aneurysm)	–	–	33 (40.7%)	–		
Structural (tumor, lesion/brain mass)	–	–	32 (39.5%)	–		
Other (e.g., traumatic brain injury, seizures)	–	–	16 (19.8%)	–		
Relationship to patient					–	0.06(1)
Spouse/partner	–	182 (66.2%)	–	54 (56.8%)		
Parent	–	6 (2.2%)	–	13 (13.7%)		
Child	–	51 (18.5%)	–	9 (9.5%)		
Other	–	35 (12.8%)	–	4 (4.2%)		

Note: Where categories do not add to listed *N*, data were not reported by participants.

100' > *d*

10' > *d*
**
5' > *d*
*

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Table 2

Anxiety and depression Symptoms of Patients with Incurable Cancer or Acute Neurological Injury (ANI) and their Family Caregivers

	Cancer		ANI		Cancer compared to ANI			
	Patients (N=350)	Caregivers (N=275)	Patients – Caregivers (N _{dyad} =275)	Patients (N=81)	Caregivers (N=95)	Patients – Caregivers (N _{dyad} =75)	Patients – Patients	Caregivers – Caregivers
	M (SD)	M (SD)	r	M (SD)	M (SD)	r	t (df)	B [SE]
HADS-Anxiety	5.31 (3.92)	6.93 (4.41)	.21***	6.90 (4.09)	7.16 (4.08)	.06	-3.55 (430)***	-1.53 [0.54]**
HADS-Depression	4.65 (4.01)	3.81 (3.55)	.21***	5.15 (3.65)	5.45 (2.91)	.30**	0.99 (430)	0.75 [0.53]
							-4.03 (369)***	-1.37 [0.43]*

* $p < .05$

** $p < .01$

*** $p < .001$

Note. For comparisons, *B* values are from regression analyses adjusting for differences in sample demographics (patients: age, race, education; caregivers: age, race).