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Difficulties in screening for adjustment disorder, Part I: Use of existing screening instruments in cancer patients undergoing bone marrow transplantation

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ABSTRACT

Objective: Although success rates for bone marrow transplantation (BMT) continue to improve, there is still a high level of morbidity and physical and emotional distress associated with BMT. To date, limited research has focused on the assessment of and screening for specific psychiatric disorders of patients facing BMT. This is especially true with regard to identifying adjustment disorder (AD), despite the fact that AD is the most prevalent psychiatric diagnosis in cancer patients.

Methods: A sample of 95 BMT patients were interviewed using the Structured Clinical Interview for Diagnostic and Statistical Manual of Mental Disorders, 4th edition (SCID) and completed several commonly used self-report instruments to determine if these tools could be used to identify patients with adjustment disorder in need of further assessment and intervention.

Results: Of these patients, 34.7% were diagnosed with adjustment disorder, 11.6% with major depression, and 5.3% with generalized anxiety disorder. The instruments were not found to be predictive of AD. However, the results of a regression analysis showed that the Social Subscale of the Functional Assessment of Cancer Therapy–General (R^2 Δ = 0.04, $F = 4.30$, $p < 0.05$) was a significant predictor of adjustment disorder.

Significance of results: We conclude that there is little efficacy in using existing scales for detecting adjustment disorders in cancer patients undergoing bone marrow transplantation, and that other tools for identifying patients with adjustment disorder who might benefit from counseling are needed.

KEYWORDS: Adjustment disorder, Screening, Bone marrow transplant

INTRODUCTION

Adjustment disorder (AD) is the most prevalent psychiatric diagnosis associated with cancer. Prior research reports rates of AD of 25–30% in ambulatory populations with cancer (Derogatis et al., 1983; Dugan et al., 1998), which may be even higher in the typically more symptomatic patients facing bone marrow transplantation (BMT). Despite this high prevalence, most efforts at screening for mental problems in cancer patients have focused on major depression rather than so-called minor depression, or adjustment disorder.

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The National Comprehensive Cancer Network (NCCN) has noted that a crisis is developing regarding the lack of psychosocial screening for distress (American Society for Psychosocial and Behavioral Oncology/AIDS, 1999). Although using the term "distress" to avoid perceived stigma by patients, the NCCN definition, that is, an unpleasant emotional experience of a social or psychological nature that is tied to and interferes with the ability to effectively cope with cancer and cancer-related treatment, very closely corresponds to the psychiatric diagnosis of adjustment disorder. The NCCN guidelines further state that there are no standards of care for the psychosocial domain of cancer care and that there is no referral pattern or algorithm for identifying the level of distress or appropriate treatment modalities. As a way to remedy the situation, the NCCN are calling for the development or identification of rapid, brief screening tools that can measure distress in clinics and offices, and that can be administered by the primary oncology team. The use of such tools should be carried out with respect for their psychometric qualities and relationship to clinical diagnoses. Thus, the current study represents a potential contribution to this effort.

The ultimate utility of adjustment disorder as a diagnostic category for oncology is to identify those patients who may be in need of intervention yet do not meet full criteria for DSM-IV diagnoses such as major depression or generalized anxiety disorder. Persons with adjustment disorder have been shown to have positive outcomes when they are treated with brief psychotherapy (Sifneos, 1989), the usual form of psychotherapy employed by psycho-oncologists. Thus, screening for AD allows for the possibility of early treatment using counselors, nurses, and other staff before a problem worsens to the point of requiring more intensive care. The rapid identification of adjustment disorder can prompt early psychological intervention that can help to promote the patient's quality of life, or at the very least, may prevent the further erosion of the patient's ability to function (Strain, 1998).

Of theoretical interest to the current study is the relationship between adjustment disorder and major depression (MD), which may be explained from two main viewpoints. One conceptualization speculates that adjustment disorder is simply *quantitatively* different from major depression. That is, mood disorders and adjustment disorders lie along a continuum with the main differentiation one of severity (Angst & Dobler-Mikola, 1984). Adjustment disorder, then, would occupy a niche somewhere between a major mental disorder and the normal unhappiness experienced under the extreme stress of cancer. According to this conceptualization (as a "subclinical depression"), moderate scores on traditional depression screens would be diagnostic for this disorder (Strain, 1998). However, currently there is no uniform agreement on what cutoffs should be used to identify AD using depression screens, if indeed AD is a minor or subclinical depression.

An alternative conceptualization of the relationship between adjustment disorder and major depressive disorder is that the two disorders are *qualitatively* or categorically distinct. According to this point of view, major depression is seen as a symptom-based diagnosis (e.g., 5 of 9 specific symptoms for more than 2 weeks) whereas adjustment disorder is more function based (e.g., inability to maintain role functioning). To lend credence to this view, Andreasen and Hoenk (1982) followed patients for 5 years and found that only 21% of adult patients diagnosed with adjustment disorder ever developed a diagnosis of depression. The vast majority of the patients, 71%, were completely well at the end of the study, apparently due to remediation of the stressors.

Further evidence that AD and major depression may be distinct is the finding that depression screens may fail to detect AD. A recent study by Passik et al. (2001) shows that a traditional depression screen does not adequately identify adjustment disorder in ambulatory oncology patients. In addition, another recent study (Gawronski & Privette, 1997) of health care workers found that so-called "reactive depression" was not correlated with results on the Zung Self-Rating Depression screen. These findings lend some support to the qualitative school of thought.

Whether either of the approaches discussed above (quantitative versus qualitative) are eventually shown to have utility, the fact remains that the underdiagnosis and undertreatment of psychological problems, and subsequent negative impact on quality of life, remain highly prevalent (Katon & Sullivan, 1990; Dugan et al., 1998; Zabora, 1998). It is clear that persons with psychological distress in general and adjustment disorder in particular are not being diagnosed or recognized by oncology professionals (Razavi et al., 1990).

The purpose of this study was to identify whether measurement scales for anxiety and depression could be used to identify and adequately differentiate between adjustment disorder, major depression, and generalized anxiety disorder in a BMT population chosen due to their potential for higher overall rates of distress. It also was designed to identify the relationship between these disorders and quality of life.

METHODS

Participants

Patients at Indiana Bone and Marrow Transplantation in Indianapolis, Indiana, were identified at various stages of the transplant process, including pre- and posttransplant patients. The potential participant pool was limited to an outpatient sample, due to the length of time necessary to complete the interview and self-report measures. It was felt that many inpatients would be too fatigued to complete the measures during the active phase of inpatient treatment. A convenience sample was used consisting of 95 successive patients to the clinic.

Procedures

Potential participants were approached during clinic appointments. Pretransplant patients were approached on the work-up day on which all of their preliminary laboratory tests were performed. This was an ideal day to meet with them because they were available in the clinic throughout the entire day. Posttransplant patients were approached during their clinic follow-up appointments in which there was also ample time for them to be approached. Subjects were asked to participate and informed consent was obtained prior to administering for this internal review board-approved study. No clinic patients refused to participate.

Measures

A combination of a semistructured interview and self-report questionnaires was used to assess the various components of interest in this study. Scales were selected to measure mood, quality of life, anxiety, avoidant thinking, and intrusive thoughts. The study design was cross-sectional and correlational.

Demographics / Medical Information

A general information sheet, including demographic interview questions, was created for the study. The demographic questions ask for information on age, sex, race, marital status, and education level. Other questions focused on disease site, type of BMT, prior trauma and other medical treatments, and history of cancer treatment.

Structured Clinical Interview for DSM-IV

The SCID is a semistructured clinical interview broken into separate modules to cover major diagnostic classes such as anxiety disorders, mood disorders, adjustment disorders, and psychotic disorders. The modules contain open-ended questions with follow-up questions for symptoms that are endorsed by the subject. Criterion items are scored with a question mark if there is insufficient information, 1 if the symptom is absent, 2 if the symptom is subthreshold, or 3 if the symptom is present (Steinberg, 1994). Prior work has reported high levels of interrater reliability for portions of the SCID, especially for major depressive disorder (kappa 0.93) and generalized anxiety disorder (kappa 0.95), with moderate agreement for diagnoses such as adjustment disorder (kappa 0.74; Skre et al., 1991; Segal et al., 1994). For the total SCID, weighted kappa was 0.61 for current disorders and 0.68 for lifetime disorders (Segal et al., 1994). For the current study, only the SCID modules measuring major depression, generalized anxiety disorder, and adjustment disorder were used. When assessing adjustment disorder, data were collected regarding the source of any significant stressors to make sure they were related to BMT. The anxiety and depression modules were selected to act as a divergent validity check.

Zung Self-Rating Depression Scale (ZSDS)

The ZSDS (Zung, 1967*a*, 1967*b*) is a 20-item self-report measure of the symptoms of depression. Subjects rate each item regarding how they felt during the preceding week using a 4-point Likert scale, with 4 representing the most unfavorable response. After correcting for items that are reverse-scored, the 20 items are summed to create a total score. Scores are not meant to offer strict diagnostic guidelines but rather denote levels of depressive symptomatology that may be of clinical significance. The ZSDS has been shown to be both valid and reliable, with high internal consistency of 0.84 and test–retest reliability of 0.86 (Tate et al., 1993; Dugan et al., 1998). Gabrys and Peters (1985) reported that the ZSDS had an interrater reliability of 0.89, internal consistency reliability of 0.88 (Cronbach's alpha), mean item-total correlations of 0.85, split-half reliability of 0.94, and showed preliminary evidence of discriminant validity, significantly differentiating between nondepressed and depressed clients ($t = 30.85$, $p < 0.0001$).

Zung Self-Rating Anxiety Scale (ZSAS)

The ZSAS is a 20-item self-report measure of the severity of anxiety and associated somatic symptoms (Zung, 1971; Maddock et al., 1998). Items are rated on a 4-point likert scale ranging from 1 (*none or a little of the time*) to 4 (*most or all of the time*) based upon how the subject has felt during the past week. After correcting for reverse-scored items, the questions are summed to yield a total scale score,

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with higher scores indicative of greater levels of anxiety. The scale has been shown to have high internal consistency (coefficient alpha = 0.83), good split-half reliability (r = 0.83), and to modestly correlate with other measures of anxiety (r = 0.33; Zung, 1971; Bystritsky et al., 1990).

Impact of Events Scale (IES)

The IES is a 15-item scale designed to measure the perception of stressors specific to BMT. Patients are asked to rate how frequently they experienced each event during the past week using a 4-point Likert scale ranging from 0 (*not at all*) to 3 (*often*). The measure is composed of two subscales: one for intrusive thoughts and one for avoidant thinking (Hodgkinson & Joseph, 1995). The intrusion subscale explores such things as repetitive behavior, disturbing dreams, and waves of negative feelings. The avoidance subscale focuses on denial, awareness of detachment, and behavioral inhibition. The IES has been shown to exhibit high split-half reliability (r = 0.86) and test–retest reliability (r = 0.87). Internal consistency reliability was 0.82 (Cronbach's alpha) for the avoidance subscale and 0.78 for the intrusion subscale (Horowitz et al., 1979). The IES was chosen to explore the degree to which patients perceived life with BMT as a stressor.

Functional Assessment of Cancer Therapy—General (FACT-G)

The FACT-G is a 27-item cancer-specific self-administered questionnaire assessing four quality of life domains: physical, social and family, emotional, and functional well-being. Items are rated on a 5-point Likert scale, from 0 (*not at all*) to 4 (*very much*). Patients rate how true each statement has been for them during the past 7 days. After accounting for reverse-scored items, questions are summed to form the four subscales as well as a total score, with higher scores indicative of greater overall quality of life. The instrument is easy to use, brief, reliable, and valid (Cella et al., 1993; Winstead-Fry & Schultz, 1997). The measure has been shown to yield adequate to high internal consistency, exhibiting coefficient alphas ranging from 0.63 to 0.86 for the subscales and 0.90 to 0.95 for the total scale (Cella et al., 1995; Brady et al., 1997). The scale also has shown high test–retest reliability (r = 0.87) and concurrent validity as demonstrated by strong correlations with the Functional Living Index-Cancer (r = 0.80; Yellen et al., 1997).

Psychoticism Subscale

The Psychoticism subscale (PS) of the Brief Symptom Inventory (Zabora et al., 1990; Tate et al., 1993; Allen et al., 1996) is a 5-item screen that focuses mainly on issues of social isolation and withdrawal, two very common aspects of adjustment disorder and depression. Ratings are made using a 5-point Likert scale (0 = *not at all*, 4 = *extremely*). Cancer patients tend to have elevated scores on this scale (Neitzert et al., 1998). In cancer patients, the PS seems to measure an essential existential aspect of life with the disease (i.e., feeling alienated) and problems of adjustment rather than actual psychotic symptoms. In essence, the scale may be a good screening tool for identifying cancer patients in crisis, even though the original intent of the subscale was to delineate psychotic features. Internal consistency ratings of the PS, measured by Cronbach's alpha, range from 0.71 to 0.75 (Derogatis & Melisaratos, 1983; Boulet & Boss, 1991; Broday & Mason, 1991). The subscale also has shown moderate validity, with correlations ranging from 0.48 to 0.51 with the Schizophrenia subscale of the Minnesota Multiphasic Personality Inventory (MMPI; Derogatis & Melisaratos, 1983; Boulet & Boss, 1991). The Psychoticism subscale also has been shown to correlate highly (r = 0.92) to its parent Psychoticism subscale on the SCL-90-R (Wood, 1982).

Data Analysis

Descriptive statistics were calculated on all data from the sample. Regression analyses were used to determine the association between the predictor scales and SCID-identified adjustment disorder. Finally, sensitivity and specificity statistics when identifying adjustment disorder were calculated for the predictor scales.

RESULTS

The average age of the sample was 45.76 years (SD = 11.72) and was comprised of 41 women (43.2%) and 54 men (56.8%). About a third of the participants had a high school education (33.7%, n = 32), 27.4% (n = 26) had some college course work, and 13.7% (n = 13) had a college degree. Most were currently married (68.4%, n = 65), 14.7% (n = 14) were single, and 10.5% (n = 10) were divorced. The vast majority (92.6%, n = 88) were Caucasian and the remainder (7.4%, n = 7) were African-American. In addition, the majority (52.6%, n = 50) were disabled, although some were currently employed full-time (23.2%, n = 22) or were homemakers (8.4%, n = 8). The type of tumor varied across the sample, with acute myeloid leukemia (24.2%, n = 23), multiple myeloma (23.2%, n = 22), and chronic myeloid leukemia (15.8%, n = 15) being most prevalent. At

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Table 1. *Prevalence of adjustment disorder, major depression, generalized anxiety disorder, and no diagnosis by type of bone marrow transplant and pre- versus posttransplant status*

	BMT type and pre- versus posttransplant status			
SCID diagnosis	Preautologous	Postautologous	Preallogeneic	Postallogeneic
Adjustment disorder (n = 33)	33.30% (n = 11/33)	12.10% (n = 4/33)	27.30% (n = 9/33)	27.30% (n = 9/33)
Major depression (n = 11)	18.20% (n = 2/11)	27.30% (n = 3/11)	18.20% (n = 2/11)	36.40% (n = 4/11)
Generalized anxiety disorder (n = 5)	40.00% (n = 2/5)	20.00% (n = 1/5)	20.00% (n = 1/5)	20.00% (n = 1/5)
No diagnosis (n = 46)	34.80% (n = 16/46)	12.40% (n = 8/46)	19.60% (n = 9/46)	28.30% (n = 13/46)

BMT: bone marrow transplant; SCID: Structured Clinical Interview for DSM-IV.

the time of the interview, most of the participants were either preautologous transplant (32.6%, n = 31) or postallogeneic transplant (28.4%, n = 27).

Analyses were conducted to explore possible relationships between the demographics and the study measures. None of the demographic variables were significantly related to SCID diagnosis (i.e., adjustment disorder, major depression, and generalized anxiety disorder). However, age was significantly negatively related to stress (IES; $r = -0.22$, $p < 0.05$) and being unemployed was significantly related to both stress (IES; $F = 4.620$, $p < 0.001$) and anxiety (ZSAS; $F = 4.013$, $p < 0.001$).

Table 1 summarizes the obtained prevalence rates for the SCID diagnoses within BMT types broken down by transplant type and status. Based on the SCID results, slightly more than half of the participants were suffering from a currently diagnosable mental illness, 34.7% (n = 33) received a diagnosis of adjustment disorder, 11.6% (n = 11) received a diagnosis of major depression, and an additional 5.3% (n = 5) met the criteria for the diagnosis of generalized anxiety disorder. The remaining 46 participants (48.4%) did not meet criteria for any of the disorders examined. There were no significant differences in number or type of psychiatric diagnoses as a function of either BMT type ($\chi^2_{1,3} = 0.64$, n.s.), specific transplant status ($\chi^2_{1,3} = 2.02$, n.s.), or a combination of both factors ($\chi^2_{1,9} = 3.05$, n.s.).

Table 2 displays the means, standard deviations, range, and internal consistency alpha coefficients for the predictor variables. As shown in the table, participants displayed considerable variation in their scores on all measures. In addition, all of the predictor measures exhibited adequate internal consistency. Cronbach's alpha for the IES, ZSDS, and FACT-G were very good ($\alpha > 0.88$). Internal consistency for the ZSAS was still adequate ($\alpha = 0.77$); however, the alpha for the PS was marginal ($\alpha = 0.64$).

Correlations between Study Measures

Bivariate correlations were calculated between all of the predictor measures used in the study. All of the scales were significantly intercorrelated with each other; however, only two correlations exceeded 0.5 (25% shared variance). The ZSDS was significantly related to the ZSAS ($r = 0.58$, $p < 0.001$), and to the FACT-G ($r = -0.74$, $p < 0.001$).

The predictor measures also were correlated with the SCID diagnoses (see Table 3). Note that negative correlations do not necessarily indicate an indirect relationship between constructs. Higher scores on the FACT-G indicate higher functioning, whereas higher scores on the IES, ZSDS, ZSAS, and PS indicate poorer functioning. As expected, the ZSDS was the best predictor of major depres-

Table 2. *Means, standard deviations, variances, and Cronbach's alphas measuring internal consistency of the measures*

Measures	Mean	*SD*	Range	Alpha
IES	5.16	7.36	0–34	0.93
ZSDS	37.86	9.88	22–66	0.89
ZSAS	32.91	6.12	21–52	0.77
FACT-G	76.64	16.03	30–108	0.92
PS	0.98	1.85	0–11	0.64

IES: Impact of Events Scale; ZSDS: Zung Self-Rating Depression Scale; ZSAS: Zung Self-Rating Anxiety Scale; FACT-G: Functional Assessment of Cancer Therapy—General; PS: Psychoticism Subscale.

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Table 3. *Correlations between SCID diagnoses of adjustment disorder, major depression, and generalized anxiety disorder to the study measures*

	SCID diagnosis		
Measure	Adjustment disorder[a]	Major depression[a]	Generalized anxiety disorder[a]
IES	0.033 0.754 95	0.190 0.065 95	0.053 0.611 95
ZSDS	0.163 0.114 95	0.571** 0.000 95	0.117 0.260 95
ZSAS	0.040 0.701 95	0.294** 0.004 95	0.225* 0.028 95
FACT-G	−0.176 0.087 95	−0.514** 0.000 95	−0.033 0.750 95
PS	−0.105 0.312 95	−0.327** 0.001 95	−0.028 0.785 95

Note: Negative correlations are artifacts of scoring. Higher scores on the FACT-G are indicative of higher functioning. Higher scores on the IES, ZSDS, ZSAS, and PS are indicative of poorer functioning. SCID diagnoses were coded 1 for presence of diagnosis and 2 for no diagnosis. SCID: Structured Clinical Interview for DSM-IV; IES: Impact of Events Scale; ZSDS: Zung Self-Rating Depression Scale; ZSAS: Zung Self-Rating Anxiety Scale; FACT-G: Functional Assessment of Cancer Therapy—General; PS: Psychoticism Subscale.
[a]Stacked values are r, p level, and n, respectively.

sion ($r = 0.571$, $p < 0.001$); however, the FACT-G scale was nearly as good ($r = -0.514$, $p < 0.001$), and both the ZSAS ($r = 0.294$, $p > 0.01$) and PS ($r = -0.33$, $p < 0.01$) were significant predictors. The ZSAS was the only predictor significantly related to generalized anxiety disorder ($r = 0.225$, $p < 0.05$). None of the measures was a significant predictor of adjustment disorder.

Quality of Life (QOL)

We hypothesized that quality of life would decrease in an orderly progression as a function of the severity of the underlying diagnosis. To formally test for a rank ordering of QOL scores across the diagnostic groups, a linear test of trend was performed using a one-way ANOVA. The contrast tested was that QOL would be highest for those with no diagnosis, next highest for those with a diagnosis of adjustment disorder, and lowest for those with a diagnosis of either major depression or generalized anxiety disorder. The linear test of trend was significant ($F_{1,94} = 41.158$, $p < 0.000$). There was no evidence of higher order trends (i.e., the quadratic term was nonsignificant).

Sensitivity and Specificity Results

To further explore the utility of the predictor measures in identifying adjustment disorder, sensitivity and specificity statistics were calculated for various combinations of cutoff scores. Using the cutoff score that maximized overall predictive accuracy, the ZSDS had a specificity of 71% and a sensitivity of 51.5%, the ZSAS had a specificity of 56.5% and a sensitivity of 48.5%, the IES had a specificity of 87.1% and a sensitivity of 24.2%, the FACT-G had a specificity of 43.5% and a sensitivity of 30.3%, and the PS had a specificity of 66.1% and a sensitivity of 42.4%.

Exploratory Analyses

A series of three exploratory multiple linear regressions were performed separately to predict each of the disorders. Because there were no specific hypotheses, the enter method was used to simultaneously regress the dependent variables onto each of the independent variables. As with the correlational findings, there were no significant predictors of adjustment disorder. The regression analysis predicting SCID-identified major depression showed that the ZSDS was the only significant predictor ($R^2\Delta = 0.14$, $F = 18.91$, $p < 0.001$). The regression analysis predicting SCID-identified generalized anxiety disorder found that both the ZSDS ($R^2\Delta = 0.09$, $F = 9.81$, $p < 0.01$) and the ZSAS ($R^2\Delta = 0.08$, $F = 9.49$, $p < 0.01$) were predictors of generalized anxiety disorder in this sample.

Sensitivity and Specificity in Detecting Any SCID Diagnosis

To further explore the specificity and sensitivity of the measures, analyses were conducted to determine the scales' abilities to identify a criterion defined as any disorder (major depression, generalized anxiety disorder, or adjustment disorder). The ZSDS ($r = 0.47$, $p < 0.001$), ZSAS ($r = 0.33$, $p < 0.001$), and PS ($r = 0.32$, $p < 0.001$) all were significantly correlated to the presence of any disorder. Using the cutoff that maximized overall accuracy, the ZSDS had a specificity of 82.6% and sensitivity of 55.1%, whereas the ZSAS had a specificity of 69.6% and a sensitivity of 59.2%, and the PS had a specificity of

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78.3% and a sensitivity of 51% in detecting any disorder.

Best Prediction of Adjustment Disorder

Finally, an exploratory hierarchical-stepwise regression analysis was conducted to determine the best combination of variables to predict adjustment disorder. The possible independent variables included all of the original dependent measures (IES, ZSDS, ZSAS, FACT-G, PS), plus demographic measures (gender, age, education level, marital status, type of BMT) or predictor variable subscales demonstrating evidence of a univariate association to adjustment disorder. All of the variables were entered as independent variables in the regression. Only the Social Subscale of the FACT-G ($R^2\Delta = 0.06$, $F = 6.05$, $p < 0.05$) was a significant predictor of adjustment disorder.

DISCUSSION

To our knowledge, this study is the first to attempt to explore systematically the prevalence, correlates, and identification of the adjustment disorder diagnosis in bone marrow transplant patients. A primary purpose was to test the ability of measures for anxiety and depression to detect adjustment disorder, and secondarily to identify generalized anxiety disorder and major depression in this population.

The study results, although not overly robust, did offer some interesting findings. Only the ZSDS, used to detect major depression, was of sufficient predictive reliability to be useful in screening in this population. In contrast, none of the tested instruments was able to reliably detect adjustment disorder in this population and, although the ZSAS was correlated with generalized anxiety disorder, it was too weakly associated to be of use as a screen for the disorder.

The chief bright spot, then, was the finding that the ZSDS could be useful in detecting major depression, yielding both moderate sensitivity and specificity. Overall accuracy, however, was still quite limited. Although more modest, these results are consistent with our prior research (Passik et al., 2000, 2001; Kirsh et al., 2001), which has demonstrated that the ZSDS can be a useful screening tool for use with cancer patients.

With respect to generalized anxiety disorder, the ZSAS was the only reliable predictor, yielding a pattern of moderately high sensitivity but rather low specificity. As mentioned above, however, the correlations of the ZSAS with generalized anxiety disorder were likely too weak to be useful as a screen. Moreover, the scale demonstrated poor overall accuracy in terms of high false positive and false negative rates. Surprisingly, and consistent with the relatively low specificity obtained, the ZSAS was correlated more strongly to major depression than to generalized anxiety disorder, suggesting that it may not be a pure measure of anxiety in the BMT population. In contrast, studies in other nonmedically ill populations have supported its utility for detecting anxiety (Mavissakalian et al., 1995; Lopez & Gomez-Jarabo, 2000). However, unlike the ZSDS, which has been studied extensively in cancer populations, knowledge about the usefulness of the ZSAS with cancer patients is still limited. Based on the current results, the ZSAS does not appear to be a useful screen for this population. Future research may be better served by the selection of an alternate scale for the detection of anxiety.

As mentioned above, none of the global measures were reliably predictive of adjustment disorder. Somewhat surprisingly, the Social Subscale of the FACT-G was the only significant predictor of AD in this study. Of all the subscales of the FACT-G, the Functional Subscale (consisting of questions regarding the ability to enjoy work and life and engage in hobbies) makes the most intuitive sense to be a good predictor of AD, but this was not the case. The Social Subscale, in contrast, consists of seven questions covering social support from family and friends as well as communication and satisfaction with sex life. The social aspect of how a patient is interacting with friends and family, therefore, according to these results, may be a good predictor of adjustment disorder diagnosis. Consistent with this finding, the DSM-IV lists social impact as one of the Criterion B markers for adjustment disorder. Future research should explore further the potential predictive usefulness of measures of social adjustment in detecting adjustment disorder, to determine whether it is a genuine link to AD or simply an artifact of the current sample.

A secondary goal was to explore the potential additive negative effects on quality of life of having a mental illness diagnosis, in addition to a diagnosis of cancer. Two findings were of particular interest. First, having any mental illness (or psychiatric) diagnosis was a good predictor of reduced quality of life. That is, cancer patients also suffering from one or more of adjustment disorder, major depression, or generalized anxiety disorder had significantly impoverished quality of life compared to subjects with no psychiatric diagnosis. Thus, psychiatric diagnosis has a significant additional negative impact on quality of life, over and above the impact of cancer diagnosis. However, it is unknown if psychiatric diagnosis is a cause of, a result of, or simply a correlate of poorer quality of life. Second, the de-

gree of impact on quality of life varied with the specific psychiatric diagnosis. Subjects with adjustment disorder had significantly higher quality of life ratings than those with either major depression or anxiety, but lower quality of life than those with no psychiatric diagnosis. Interestingly, this finding provides some initial evidence that, compared to other psychiatric diagnoses or to the absence of psychiatric diagnosis, adjustment disorder may be useful as an independent and identifiable disorder as postulated earlier, with implications for quality of life and well-being that are both different from and less severe than for other psychiatric disorders. That is, the impact of adjustment disorder seems to be intermediate between no diagnosis and the more classical psychiatric diagnoses.

Other Implications

The underlying rationale for the study was that a better understanding of AD and its detection could have a profound impact on the delivery of services for cancer patients in the medical setting. As stated earlier, the usefulness of adjustment disorder as a diagnostic category for oncology is to identify those patients who may be in need of intervention but who do not meet full criteria for DSM-IV diagnoses such as major depression or generalized anxiety disorder. With early identification, persons with adjustment disorder can benefit greatly from brief psychotherapy and psychoeducation (Sifneos, 1989; Pollin & Holland, 1992; Wise, 1994; Strain, 1998). Clearly, this study has established that many persons undergoing BMT do suffer from adjustment disorder and they likely could benefit from psychiatric intervention. However, a suitable means for screening for adjustment disorder remains elusive.

Limitations

There are several limitations to the current study. First, the sample was almost completely Caucasian, which may limit the generalizability of the findings. Second, the high degree of correlation between the measures used in the study limited the degree to which findings could be interpreted as truly independent. Third, the interrater reliability of the SCID diagnoses is not known; only one rater performed the SCID diagnostic interviews. However, the fact that the prevalence estimates obtained are similar to those reported by Derogatis et al. (1983) suggests that the diagnoses made in the current study may have been reliable. It must be noted, though, that the populations in the two studies were different and one might have expected the BMT population to have a higher incidence of distress. Fourth, the study utilized a cross-sectional design and therefore results cannot be interpreted causally. Subsequent research should use a longitudinal design that would allow for the collection of data on the natural progression of AD in patients with cancer as well as the opportunity to explore the predictive utility of the measures.

Conclusion

Consistent with earlier research, the ZSDS appears to be a promising screen for the detection of major depression. However, no scale tested was able to identify those with generalized anxiety disorder with adequate reliability. Moreover, there was a clear problem in trying to find a screen for adjustment disorder. None of the scales were able to detect adjustment disorder with any degree of reliability. Thus, the challenge is to continue work in the area to identify core concepts that can help identify adjustment disorder and lead to the creation of brief screening tools. For example, the current findings suggest that social functioning may be a useful starting point. The presence of psychiatric diagnosis had a clear additive negative impact on quality of life. Those with major depression and generalized anxiety disorder had the worst overall quality of life followed by moderate impairment in those with adjustment disorder and finally by the highest quality of life in those without any diagnoses. Although adjustment disorder may represent an intermediate level of clinical disorder relative to the other diagnoses examined, it nevertheless is indicative of distress that can be treated with good outcomes in this medically ill population.

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