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HYPNOTIZABILITY, POSTTRAUMATIC STRESS, AND DEPRESSIVE SYMPTOMS IN METASTATIC BREAST CANCER¹

Alex S. Keuroghlian, Lisa D. Butler, Eric Neri, and David Spiegel²

Stanford University School of Medicine, Stanford, California, USA

Abstract

This study assessed whether high hypnotizability is associated with posttraumatic stress and depressive symptoms in a sample of 124 metastatic breast cancer patients. Hypnotic Induction Profile Scores were dichotomized into low and high categories; posttraumatic intrusion and avoidance symptoms were measured with the Impact of Events Scale (IES); hyperarousal symptoms with items from the Profile of Mood States; and depressive symptoms with the Center for Epidemiologic Studies-Depression Scale. High hypnotizability was significantly related to greater IES total, IES intrusion symptoms, and depressive symptoms. A logistic regression model showed that IES total predicts high hypnotizability after adjusting for depressive symptoms and hyperarousal. The authors relate these results to findings in other clinical populations and discuss implications for the psychosocial treatment of metastatic breast cancer.

Phenomena related to hypnosis can be helpful in both the assessment and treatment of stress-related symptomatology, including dissociation and posttraumatic stress disorder (PTSD). The considerable variance in symptomatic response to the same stressor, such as the diagnosis and treatment of breast cancer, may in part be accounted for by traits such as hypnotizability. Hypnosis can be conceptualized as consisting of three psychological components: absorption, dissociation, and suggestibility (H. Spiegel & Spiegel, 2004). Hypnotizability represents the individual's degree of responsivity to suggestion during hypnosis (Green, Barabasz, Barrett, & Montgomery, 2005) and is a highly stable and measurable trait (Piccione, Hilgard, & Zimbardo, 1989; H. Spiegel & Spiegel). Several studies have demonstrated a relationship between hypnotizability and posttraumatic stress. For example, previous research has shown that hypnotizability is significantly higher among combat veterans with PTSD than among control populations (Bryant, Guthrie, Moulds, Nixon, & Felmingham, 2003; D. Spiegel, Hunt, & Dondershine, 1988; Stutman & Bliss, 1985), including those with depression (D. Spiegel et al.). Another study assessed trauma symptoms within 2 weeks of hospitalization and found that burn injury victims who were highly hypnotizable had an increased frequency of intrusive avoidance and arousal symptoms compared to low and midrange hypnotizables (DuHamel, Difede, Foley, & Greenleaf, 2002). In addition, hospitalized patients exposed to an automobile accident or nonsexual assault with clinically significant acute stress disorder (ASD) were significantly more hypnotizable than those with subclinical ASD or no ASD (Bryant, Guthrie, & Moulds, 2001). One study of college students at a Midwestern university found hypnotizability to be positively correlated with both PTSD and depression (Sapp, Ioannidis, & Farrell, 1995).

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²Address correspondence to Alex S. Keuroghlian, Stanford University School of Medicine, 401 Quarry Road, Office 2325, Stanford, CA 94305-5718, USA. alexk22@stanford.edu.

Thus, hypnotizability is a clinically salient measure for examination of stress, PTSD, and depression among breast cancer patients.

Breast Cancer, PTSD, and Depression

Though most women with breast cancer do not meet diagnostic criteria for major depression, the vast majority experience their breast cancer diagnosis and treatment as a significant stressor. Up to 80% of patients experience significant distress as a result of the initial diagnosis (Hughes, 1982; Irvine, Brown, Crooks, Roberts, & Browne, 1991), while 30% to 44% are sufficiently symptomatic to merit a psychiatric diagnosis, including adjustment disorders and depression (Derogatis et al., 1983; Ford, Lewis, & Fallowfield, 1995). Patients with metastatic breast cancer have a similar prevalence of psychiatric illness (31%–42%; Kissane et al., 2004) and a majority of patients reporting clinically significant levels of intrusion and avoidance symptoms (Butler, Koopman, Classen, & Spiegel, 1999). One to 2 years after diagnosis, 20% to 45% of patients continue to exhibit significant emotional distress (Ganz, Lee, Sim, Polinsky, & Schag, 1992; McGuire et al., 1978; Morris, Greer, & White, 1977; Omne-Ponten, Holmberg, & Sjoden, 1994).

Rates of PTSD in cancer patients range from 3% to 14% and subsyndromal PTSD may be found in more than 50% of patients (Gurevich, Devins, & Rodin, 2002). Within a 2-year period following initial breast cancer diagnosis, the severity of cancer-related avoidance and intrusion symptoms predicts depressive symptoms (Golden-Kreutz & Andersen, 2004) and decreased quality of life (Golden-Kreutz et al., 2005). PTSD in breast cancer patients is also related to poorer functioning, employment absenteeism, and seeking mental health services (Shelby, Golden-Kreutz, & Andersen, 2008).

This study was designed to identify personality factors that may exacerbate posttraumatic stress and depressive symptomatology in patients with metastatic breast cancer. It is part of a larger clinical trial designed to examine the effects of supportive-expressive group psychotherapy on survival time among 125 women with metastatic breast cancer (D. Spiegel et al., 2007). We hypothesized that posttraumatic stress symptoms would be positively related to hypnotizability.

Method

Participants

The population studied consisted of 125 women diagnosed with stage IV metastatic breast cancer. Patients with another life-threatening comorbid medical illness or psychiatric or other mental disorder that had required hospitalization in the previous year were excluded. All assessments were conducted at baseline, prior to randomization in the psychotherapy trial. The average time from breast cancer recurrence to assessment was 22 months ($SD = 29$; range = 1–147). Out of 125 subjects initially included in the study, 1 subject refused to be hypnotized for the study; thus, 124 subjects were ultimately assessed.

Patients completed questionnaires to assess depressive symptoms, demographic and disease status variables, and medical treatments. Demographic characteristics and disease status indicators of the women are illustrated in Table 1.

Assessment of Hypnotizability

Hypnotizability was assessed using the Hypnotic Induction Profile (HIP; H. Spiegel & Spiegel, 2004). The HIP provides a linear induction score from 0 (lowest) to 10 points (highest) that can be used for statistical analysis and possesses outcome validity and high test-retest reliability (H. Spiegel & Spiegel; Stern, Spiegel, & Nee, 1978). The 0-to-10

induction score is obtained by assessing responses to a standard hypnotic induction and a series of suggestions. The components of the induction score, each scored from 0 to 2, are the experience of dissociation in the hand instructed to feel light and float upwards, the postinduction levitation after the hand is pulled down, the sense of differential control between the two hands, the response to the cutoff of hypnotically instructed lightness in the hand, and the experience of sensory alteration. The HIP is moderately and positively correlated with the longer Stanford Hypnotic Susceptibility Scales, with a range of correlations between .45 and .6, similar to the correlation of any one item of the Stanford Scale to the total score (Frischholz, Spiegel, Trentalange, & Spiegel, 1987; Orne et al., 1979).

Posttraumatic Stress Symptoms

The Impact of Events Scale (IES; Horowitz, Wilner, & Alvarez, 1979) is a self-report 15-item scale that assesses subjective distress, specifically intrusion and avoidance symptoms, after a stressful life event. Intrusion symptoms include experiencing unbidden thoughts and trauma-related feelings or images. Avoidance symptoms include trying to avoid reminders of the trauma or to dull one's emotional reactions to it. Subjects rate the frequency of intrusive or avoidant experiences in the week prior to testing, using a 4-point scale with scores ranging from 0 to 5 (0 = *not at all*, 1 = *rarely*, 3 = *sometimes*, 5 = *often*). IES total score and intrusion and avoidance subscale scores were assessed. The IES has been used with a wide variety of populations, including metastatic breast cancer patients (Butler et al., 1999) and has been demonstrated to be a valid and reliable measure (Sundin & Horowitz, 2002). Participants were asked to estimate how often they experienced symptoms throughout the past week in response to having cancer. The IES was used instead of the revised IES (IES-R) because these data were collected prior to the development of the IES-R (Weiss & Marmar, 1997). In order to assess hyperarousal, the third symptom dimension of PTSD in the *Diagnostic and Statistical Manual of Mental Disorders* (4th ed. [*DSM-IV-TR*]; American Psychiatric Association, 2000), we conducted a factor analysis of 15 items selected for their salience to hyperarousal/irritability from the Profile of Mood States (POMS; described below) and produced three hyperarousal factors (*anxious*, *angry*, and *annoyed*).

Mood Disturbance

We measured disturbances in mood using the Profile of Mood States (POMS; McNair, Lorr, & Droppleman, 1992). The POMS is a commonly used measure of affective states that has demonstrated validity in a variety of populations. Participants use a 5-point Likert scale, ranging from 0 = *not at all* to 4 = *extremely*, to rate 65 adjectival descriptors of their moods (e.g., angry, sad, tense, clear headed) during the week prior to testing. A Total Mood Disturbance (TMD) score is generated from the six POMS subscales (tension-anxiety, depression-dejection, anger-hostility, vigor-activity, fatigue-inertia, and confusion-bewilderment). These six subscales have internal consistencies ranging from .87 to .95 (McNair et al.).

Depressive Symptoms

Depressive symptoms were measured with the Center for Epidemiologic Studies-Depression Scale (CES-D; Radloff, 1977). The measure consists of 20 items that assess mood, somatic symptoms, and interpersonal relationships during the past 7 days on a 4-point scale based on frequency of occurrence, ranging from 0 (*rarely or none of the time [less than one day]*) to 3 (*most or all of the time [5 to 7 days]*). The summary score ranges from 0 to 60, with higher scores indicating more severe depressive symptoms. The CES-D has been used to study a variety of populations (Beekman et al., 1997; Caracciolo & Ciaquinto, 2002; Radloff, 1977).

and has been demonstrated to be both valid and reliable with cancer patients (Hann, Winter, & Jacobsen, 1999; Schroevers, Sanderman, van Sonderen, & Ranchor, 2000).

Statistical Analyses

We dichotomized the HIP Induction Scores into “low” (0 to 5) and “high” (>5) hypnotizability categories. We conducted bivariate correlations to examine the relationship of high hypnotizability to depressive symptoms (CES-D), mood disturbance (POMS), subjective distress after a stressful life event (IES total, IES avoidance, IES intrusion), and the POMS-derived hyperarousal factors.

We also conducted a logistic regression in which hypnotizability was the dependent variable, while CES-D, IES total, and the POMS-derived hyperarousal factor 1 (of the three hyperarousal factors, this “anxious” factor incorporated the largest number of POMS items) were the independent variables. Independent variables were centered to minimize collinearity (Kraemer & Blasey, 2004). In this regression model, we included interaction terms for CES-D with both IES total and POMS-derived hyperarousal factor 1 to assess interactions between depressive symptoms and trauma symptoms.

Results

Demographic, medical, and descriptive psychological variables are presented in Table 1. Bivariate correlations of high hypnotizability with subjective distress after a stressful event, mood disturbance, and depressive symptoms are shown in Table 2.

High hypnotizability was significantly related, to greater IES total ($r_s = .19$, $CI = .02$ to $.36$, $p = .0312$) and IES intrusion ($r_s = .26$, $CI = .09$ to $.42$, $p = .0034$) but was not significantly associated with IES avoidance. Five out of the seven IES intrusion components were significantly related to hypnotizability. None of the three POMS-derived hyperarousal measures constructed was significantly related to high hypnotizability. POMS total mood disturbance was also not significantly related to hypnotizability.

High hypnotizability was significantly related to greater depressive symptoms as well ($r_s = .20$, $CI = .02$ to $.36$, $p = .0271$). This relationship remained significant when considering only those subjects with subthreshold depression ($r_s = .25$, $CI = .04$ to $.43$, $p = .0180$) but not when considering only those subjects who met threshold criteria for clinical depression.

A logistic regression model showed that the IES total score remained significantly associated with hypnotizability after adjusting for depressive symptoms and hyperarousal: for every five-unit increase in IES total, the odds of high hypnotizability increased by 1.21 ($b = .039$; $CI = .00$ to $.07$; $p = .0292$). No other independent variables or interaction terms were significant. The model was significantly better than an empty model (the Likelihood Ratio test was significant: $c^2 = 11.26$; $p = .0465$), and the Hosmer-Lemeshow Goodness of Fit test was not significant (there was no significant difference between observed and predicted values).

Discussion

This study found that high hypnotizability was associated with posttraumatic stress and depressive symptoms in women with metastatic breast cancer. The relationship between posttraumatic stress symptoms and hypnotizability remained significant after accounting for depressive symptoms and hyperarousal symptoms. These data support findings in other populations, although existing studies of the relationship between these variables have usually sampled no more than 65 subjects and tended to oversample male trauma survivors

(Yard, DuHamel, & Galynker, 2008), despite the greater prevalence of PTSD in women (Resnick, Kilpatrick, Dansky, Saunders, & Best, 1993).

Our overall finding that depressive symptoms were positively related to hypnotizability remained significant for the subset with subthreshold depression but did not remain significant when considering only the subset of patients who met threshold criteria for clinical depression. Thus, the results are reconcilable with other studies in which patients with clinically significant mood disorders were found to be equally (Frischholz, Lipman, Braun, & Sachs, 1992) or less hypnotizable (Pettinati et al., 1990; D. Spiegel, Detrick, & Frischholz, 1982; D. Spiegel et al., 1988) than controls. The crucial variance in our sample involved those subjects with subthreshold depressive symptoms, who were more comparable to the population of Midwestern college students in which depressive symptoms were related to increased hypnotizability in the context of a relatively low incidence of PTSD (Sapp et al., 1995; Yard et al., 2008), rather than to those who were significantly depressed.

It is impossible to conclusively explain the hypnotizability and trauma symptom findings without having prospectively collected data on hypnotizability before and after a traumatizing event. It is possible that higher hypnotizability resulted in higher levels of trauma-related symptoms or, conversely, that disease-related traumatic experience in this population led to higher hypnotizability. Increased hypnotizability has been observed, for example, as a result of both restricted environmental stimulation and brief Antarctic isolation (A. Barabasz, 1980A. Barabasz, 1982; A. Barabasz & Barabasz, 1989; M. Barabasz, Barabasz, & Mullin, 1983). Hypnotizability and proneness to dissociation are at best modestly correlated in general populations (Frischholz, Braun, et al., 1992; Kihlstrom, Glisky, & Angiulo, 1994) but were more strongly associated among those with severe histories of traumatic stress (Putnam, Helmers, Horowitz, & Trickett, 1995). One possible reason for the relatively low correlation between hypnotizability and dissociation involves process rather than content: hypnosis is a controlled type of dissociation, whereas spontaneous dissociative experiences are often unbidden and uncontrolled (Barrett, 1992). Moreover, the study does not address how high hypnotizability might relate to other dimensions of the psychopathologies measured, such as outcomes and chronicity (Yard et al., 2008).

Alternatively, highly hypnotizable individuals may be at an increased risk of developing posttraumatic stress by virtue of their greater responsivity to external stimuli, suggestibility, and dissociative capacity (H. Spiegel & Greenleaf, 1992). In a diathesis-stress model of hypnotizability and posttraumatic stress, a person's predisposition to enter a hypnotic state interacts with the experience of a traumatic event to produce pathological dissociation, which varies in severity as a function of both the individual's innate dissociativity and the intensity of the traumatic event (Butler, Duran, Jasiukaitis, Koopman, & Spiegel, 1996). Entering a dissociated state in response to a traumatic event may serve as a coping mechanism (D. Spiegel, 1986; Van der Hart Nijenhuis, Steele, & Brown, 2004; Van der Kolk & Van der Hart, 1989) by providing psychological distance from a physically inescapable stressor, but research shows that this strategy also increases the risk of subsequently developing posttraumatic stress symptoms and other psychopathologies (Classen, Koopman, Hales, & Spiegel, 1998; Koopman, Classen, & Spiegel, 1994; McFarlane, 1986; Taal & Faber, 1997). A dissociative coping style in response to traumatic events is thought to impede an individual's capacity for cognitive and emotional processing, particularly with regard to painful emotions resulting from the trauma (Dancu, Riggs, Hearst-Ikeda, Shoyer, & Foa, 1996; Foa & Kozak, 1986; Foa, McNally, & Murdock, 1989; D. Spiegel et al., 1988). Thus, dissociative strategies may hinder long-term recovery from trauma (Dancu et al.).

In our study, high hypnotizability may have amplified both posttraumatic stress and depressive symptoms in breast cancer patients. Hypnotizability involves an increased capacity for psychological absorption and focus: breast cancer patients with high hypnotizability may thus be concentrating more on their posttraumatic stress and depressive symptoms, resulting in amplification of both. Thus, hypnotizability may constitute a personality trait that aggravates posttraumatic stress and depressive symptomatology in metastatic breast cancer.

Clinical Implications and Future Directions

The relationships we observed of posttraumatic stress and depressive symptoms to high hypnotizability suggest that high hypnotizability potentially could be used to provide early preventive interventions for metastatic breast cancer patients who are at greater risk of developing these symptoms. Moreover, psychotherapy with hypnosis has been shown to be clinically beneficial in the treatment of posttraumatic stress (D. Spiegel & Cardena, 1990; D. Spiegel et al., 1988; H. Spiegel & Spiegel, 2004; Yard et al., 2008), including reducing intrusive thoughts (Brom, Kleber, & Defares, 1989). More recently, investigators have begun using hypnosis as a component in the effective treatment of depression (Butler et al., 2008; Smith, 2004; Yapko, 2001a, 2001b; Yexley, 2007). Advancing our understanding of the relationship of PTSD and depression to hypnotizability in metastatic breast cancer patients may contribute to the development of interventions better designed to improve quality of life in this population.

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Table 1

Demographic, Medical, and Psychological Variables Among Women With Metastatic Breast Cancer ($N=124$)

Mean Age (<i>SD</i>)	53.1 (10.6)
Mean Years of Education (<i>SD</i>)	16.0 (2.6)
Ethnicity: Non-Hispanic Caucasian	87.1%
Mean Number of Children (<i>SD</i>)	2.3 (2.0)
Annual Household Income: \$60,000 or greater	45.53%
Currently Married	56.45%
Lives Alone	21.95%
Currently Employed	56.45%
Mean Disease-Free Period (<i>SD</i>) in months	46.2 (35.6)
Median months from cancer recurrence to study entry (Interquartile range)	9.5 (4.5,32.0)
Dominant cancer site at study entry: Chest Wall/Bone/Viscera	30.65%/39.52%/29.9%
Tumor estrogen receptor status: ER+/ER-/Unknown	74.19%/20.16%/5.6%
High Hypnotizability (dichotomized)	62.90%
Median Induction Score	6.0
Median CES-D Total Score	10.0
Median IES Total Score	31.0
Median IES Avoidance Score	14.0
Median IES Intrusion Score	15.0
Median POMS Total Mood Disturbance Score	22.0

Table 2

Summary of Bivariate Spearman Correlations of High Hypnotizability With Distress and Mood Variables Among Women With Metastatic Breast Cancer ($N = 124$)

Variable	Spearman Correlation with High Hypnotizability
IES Total	.193 **
IES Avoidance	.078
IES Intrusion	.261 *
IES intrusion Component	
IES1: Thought about it when I did not mean to	.245 *
IES4: Trouble falling or staying asleep	.187 **
IES5: I had waves of strong feelings about it	.262 *
IES6: I had dreams about it	.123
IES10: Pictures about it popped into my mind	.171
IES11: Other things made me think about it	.177 **
IES14: Reminders brought back feelings of it	.179 **
POMS Total Mood Disturbance	.144
Average of POMS for items in Hyperarousal Factor 1 ("Anxious")	.067
Average of POMS for items in Hyperarousal Factor 2 ("Angry")	.015
Average of POMS for items in Hyperarousal Factor 3 ("Annoyed")	.030
CES-D ($N = 124$)	.198 **
CES-D in women with subthreshold depression ($n = 92$, CES-D 15)	.246 **
CES-D in women who met threshold criteria for depression ($n = 32$, CES-D 16)	.121

*
 $p .01$.

**
 $p .05$.