

Emotional expression and diurnal cortisol slope in women with metastatic breast cancer in supportive-expressive group therapy: A preliminary study

Janine Giese-Davis^{a,*}, Sue DiMiceli^{a,1}, Sandra Sephton^{b,2}, David Spiegel^{a,3}

^aStanford University, Department of Psychiatry and Behavioral Sciences, United States

^bDepartment of Psychological and Brain Sciences and James Graham Brown Cancer Center University of Louisville, United States

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Abstract

We examined coded emotional expression during an initial therapy session and its association with a known physiological risk factor for early death, aberrant diurnal cortisol slope, in women with metastatic breast cancer. Out of 64 women with metastatic breast cancer randomized to a multi-site clinical intervention trial of supportive-expressive group therapy (SET), a subsample of 29 met eligibility criteria for this study. We tested whether longer mean durations of primary negative affect (fear, sadness, and anger) expression were associated with steeper diurnal cortisol slopes after adjusting for speaking time, repressive-defensiveness, anxiety, and the interaction between repressive-defensiveness and anxiety. We found that steeper cortisol slopes were related to lower repressive-defensiveness and greater primary negative affect expression in line with a priori hypotheses. Additionally we explored whether coded positive affect, defensive/hostile affect, constrained anger, and the interaction between primary negative affect and repressive-defensiveness explained additional variance in diurnal cortisol patterns.

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1. Introduction

Disruptions in the circadian rhythmicity of cortisol (Sephton et al., 2000), other hormones (Davis et al., 2001; Mormont and Levi, 1997; Schernhammer et al., 2001), and rest/activity cycles (Mormont et al., 2000) have emerged as processes that may connect psychological states with increases in vulnerability to cancer incidence or faster cancer progression (Sephton and Spiegel, 2003). We previously found that aberrations in diurnal

cortisol slope were associated with early death and also with greater self-report of repressive-defensiveness and anxiety in a sample of metastatic breast cancer patients (Giese-Davis et al., 2004; Sephton et al., 2000). Lack of emotional expression, (suppression or repression) has also been linked with greater cancer incidence and faster progression (Giese-Davis and Spiegel, 2003; Gross, 1989). Emotional expression may help to regulate physiological distress (Gross and Levenson, 1993) and is an important element of support groups for cancer patients (Spiegel and Classen, 2000).

In the current study we sought to extend this research to examine associations between baseline diurnal log cortisol slope and observed emotional expression during a first supportive-expressive group psychotherapy session (SET) in women with metastatic breast cancer. Although a few studies have examined the behavioral emotional expression of repressors and high-anxious participants (Milmoie et al., 1967; Rosenthal et al., 1984; Scherer et al., 1991; Tolkmitt and Scherer, 1986), nothing is known about how they express emotion in a cancer support group or whether expression of primary negative affect by repressors would be associated with

* Corresponding author at: 401 Quarry Rd Rm 2318, Stanford, CA 94305-5718, United States. Tel.: +1 650 498 5160; fax: +1 650 725 3762.

E-mail addresses: jgiese@stanford.edu (J. Giese-Davis), dimiceli@stanford.edu (S. DiMiceli), sephton@louisville.edu (S. Sephton), dspiegel@stanford.edu (D. Spiegel).

¹ Present address: 903 Paradise Way, Palo Alto, CA 94306, United States. Tel.: +1 650 493 0909.

² Present address: 2301 South Third Street, Room 317, Louisville, KY 40202, United States. Tel.: +1 502 852 1166; fax: +1 502 852 8904.

³ Present address: 401 Quarry Rd. Rm 2325, Stanford, CA 94305-5718, United States. Tel.: +1 650 723 6421; fax: +1 650 725 3762.

better physiological function. Finding that behavioral expression helps to explain additional variance in the diurnal cortisol slope beyond self-report of repressive-defensiveness and anxiety would be important information for future studies examining links between cancer support groups, physiological change, and survival.

Emotion-focused psychotherapies, such as SET, posit that direct expression of primary negative affect (fear, anger, and sadness) in a supportive setting during therapy sessions facilitates resolution of ongoing difficulties, releases pent-up emotion, and allows participants to adopt healthier thought processes (Giese-Davis et al., 2002; Giese-Davis et al., 2005; Greenberg and Safran, 1984). Longer moments of such expression may allow a woman with metastatic breast cancer to be aware of her feelings and cognitions, have time to process her feelings, become aware of choices she can make that might alleviate some of her distress, and to receive support from group members (Giese-Davis et al., 2002; Giese-Davis et al., 2005). This process may lead to better response and recovery from life crises (Classen et al., 2001; Goodwin et al., 2001; Greenberg and Safran, 1989; Spiegel and Bloom, 1983; Spiegel et al., 1981) and to better physiological function (van der Pompe et al., 1997). Emotion-regulation abilities may develop during psychotherapy for clients who have difficulty expressing or regulating affect (Giese-Davis et al., 2002; Greenberg, 1993), or may exist as trait-like abilities (Gross, 2002; Lopes et al., 2005; Salovey et al., 1995).

Cortisol is a hormone with known immunosuppressive effects under chronic stress conditions (Dhabhar and McEwen, 1997). Aberrant cortisol slopes (flatter profiles or peaks and troughs at unexpected times) have been associated with chronic stress and conditions including depression, (Deuschle et al., 1997; Ellenbogen et al., 2002), post-traumatic stress (Yehuda et al., 1996), repression and anxiety (Giese-Davis et al., 2004), chronic cancer fatigue (Bower et al., 2005a,b), higher work load (Caplan et al., 1979), insecure attachment (Adam, 1999), the chronic stress of caring for a child with cancer (Miller et al., 2002), and cancer progression (Touitou et al., 1996; Touitou et al., 1995). Relationships between observed emotional expression and aberrant cortisol slopes however have not been studied. Chronic experiences of negative life events, negative affectivity, or ineffective emotion-regulation may habitually tax the hypothalamic-pituitary-adrenal (HPA) system leading to higher allostatic load and debilitating health effects (McEwen, 1998). Ability to express and process negative affect in a supportive setting, however, may be associated with better, rather than worse, physiological function (Cruess and Antoni, 2000; McGregor et al., 2004; van der Pompe et al., 1997).

Studies examining cortisol rhythmicity over the day are most relevant to our hypotheses, but most research has instead examined mean cortisol levels assuming that lower mean levels are healthier. However, mean cortisol levels are not comparable across studies because each has utilized different time periods and sampling strategies. In addition, cortisol levels decline throughout the day making mean cortisol levels collected overnight, in the morning, and in the afternoon or evening very different. It is thus impossible to discern how the mean cortisol level is related to the diurnal slope.

Examination of the expression of primary negative affect and mean cortisol levels is sparse. Most in line with our hypotheses, Mattsson et al. found that when physicians and nurses rated hemophiliacs as expressing negative emotion, lower rather than higher mean cortisol levels were found (Mattsson et al., 1971). However, contrary to our hypotheses, Vickers found that when participants undergoing stressful life events were rated by clinicians' as visibly distressed, they had higher urinary cortisol levels (Vickers, 1988), and Davis et al. found that when parents rated children high on negative affect expression, the children had higher mean cortisol levels during the first week of school (Davis et al., 1999).

Our primary interest is in the association between primary negative affect and cortisol because SET specifically encourages this expression; however we also explored positive affect, constrained anger, and defensive/hostile expression. Many people assume that expression of positive affect is important to cancer survival even though no research documents this association (Holland and Lewis, 2000). However, greater positive affect experience has been associated with lower mean cortisol levels (Berk et al., 1989; Buchanan et al., 1999; Hubert and deJong-Meyer, 1989, 1992; Smyth et al., 1998).

Some studies indicate that constrained anger may be damaging to cancer patients (Giese-Davis and Spiegel, 2003), making examination of its expression important. Lastly, greater experience of hostility has also been associated with higher mean cortisol levels (Pope and Smith, 1991; Suarez et al., 1998). We found that participation in SET increased self-report of restraint of hostility (impulse control, suppression of aggression, responsibility, and consideration for others) (Giese-Davis et al., 2002), therefore examination of hostile expression and physiology may help to generate hypotheses mechanisms of regulation.

We predicted that longer mean durations of expression of primary negative affect during a therapy session would be associated with a steeper (healthier) cortisol slope throughout the day, lower 8:00 h level, and lower mean cortisol level (between 8:00 and 21:00 h), after adjusting for speaking time in the session, and repression and anxiety in the linear model. In a secondary exploratory analysis, we examined whether repressors who expressed primary negative affect would have less aberrant diurnal cortisol slopes. We also explored whether longer mean durations of expression of positive affect, and shorter mean durations of both constrained anger and defensive/hostile affect would account for additional variance.

2. Methods

2.1. Study Sample

Potential participants were excluded for other active cancers except basal cell or squamous cell carcinomas of the skin or in situ cancer of the cervix, positive supra clavicular lymph nodes as the only metastatic lesion at diagnosis, or any other condition likely to influence short-term survival. All participants signed informed consent in this Stanford University I.R.B. approved study. Subjects had stage IV metastatic disease (physician's Karnofsky rating $\geq 70\%$). They were English literate and lived in the San Francisco Bay Area. Of a total

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