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13. ABSTRACT *(Maximum 200*

This study evaluated breast-cancer patients and their "witnesses" (significant others) for post-traumatic stress disorder (PTSD) related to the patient's breast cancer experience. Participants were interviewed by telephone with the PTSD Checklist (PCL), invited to come for a personal interview with the Clinician-Administered PTSD Scale (CAPS), and then invited for psychophysiologic testing. The estimated incidence of breast cancer-related PTSD during the approximately two years elapsed since tissue diagnosis was 24% (21/87) in patients and 23% (7/31) in witnesses. The estimated point prevalence of breast cancer-related PTSD at the time of interview was 9% (8/87) in patients and 3% (1/31) in witnesses. Physiologic responses were measured in 5 Current, 7 Past, and 25 Never patients, and in 1 Current, 5 Past, and 17 Never witnesses, while they listened to tape-recorded "scripts" portraying their personal experiences with breast cancer. MANOVA yielded an overall group effect of $F(8,62)=2.5$, $p=.02$ for patients and $F(4,18)=6.8$, $p=.002$ for witnesses. Current PTSD patients showed statistically larger heart rate, skin conductance, and corrugator electromyogram responses than both Past and Never patients. Current/Past PTSD witnesses showed statistically larger skin conductance responses than Never witnesses. We conclude that being diagnosed with breast cancer can cause psychophysiologically reactive PTSD in breast cancer patients and their witnesses.

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Roger K. Pai MD 1/14/00

PI - Signature Date

Principal Investigator: Roger K. Pitman, M.D.

Note: This report contains unpublished data which are not to be disseminated.

4. TABLE OF CONTENTS

Principal Investigator: Roger K. Pitman, M.D.

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5. INTRODUCTION

The *Diagnostic and Statistical Manual of Mental Disorders,* 4th edition (DSM-IV),[1] includes "being diagnosed with a life-threatening illness" among examples of traumatic events capable of causing post-traumatic stress disorder (PTSD). However, this proposition has received relatively little empirical investigation, and to our knowledge it has not been subjected to psychophysiologic testing. Although there is no doubt that extremely stressful events such as military combat or rape can cause PTSD, the ability of less acute stressors, such as being diagnosed with cancer, to cause PTSD remains unclear. Although a lesion on a mammogram may be as dangerous as a rapist's knife, the threat it poses is less immediate and palpable, making the plausibility of the PTSD outcome less clear. This study evaluated recently diagnosed breast cancer patients for PTSD by means of a structured psychodiagnostic interview and a psychophysiologic script-driven imagery technique.

The DSM-IV also includes "learning about … threat of death … experienced by a family member" among examples of traumatic events capable of causing PTSD. It specifically mentions "learning that one's child has a life-threatening disease," but presumably learning the same about one's spouse or significant other would also qualify. This provision has received even less empirical investigation, and to our knowledge it also has not been subjected to psychophysiologic testing. Therefore, this study also evaluated breast cancer patients' "witnesses," i.e., significant others, with the same protocol.

6. BODY OF REPORT

Methods. All breast cancer patients diagnosed during the period 1994-96 in the private practices of four selected local surgeons were identified from a local tumor registry. University and local Institution Review Board (IRB) approval was obtained for the release of identifying information back to the surgeons' offices, but the local IRB did not permit the investigators to have access to patients' identities. The surgeons attempted to locate and refer for participation patients who were a.) age 18 or older; b.) at least one year post-tissue diagnosis of breast cancer greater than Stage 0

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and less than Stage IV; c.) finished with initial treatment; d.) free of recurrence; and e.) without potentially interfering medical or psychiatric conditions.

Referred patients were interviewed by telephone with the PTSD Checklist (PCL),[2] then invited to come for a personal interview by a psychiatrist who administered the Clinician-Administered PTSD Scale (CAPS),[3] and finally invited to participate in a validated script-driven imagery psychophysiologic procedure for PTSD.[4-7] In the laboratory, participants listened to tape-recorded "scripts" portraying their most traumatic personal experiences with breast cancer, while physiologic measures were recorded.

A "witness" to each patient's cancer experience, usually the spouse, was also invited to participate in the study's procedures.[8]

Results: Patients. One hundred eighty-seven patient candidates were identified from the tumor registry. Of these, 100 were not referred for participation by their surgeon, for the following reasons: deceased 9, lost to surgeon's follow-up 52, met study exclusion criteria 30, refused participation 9.

All of the 87 patients referred for participation completed the telephone PCL. Of these, 50 agreed to come in for the CAPS. Of those who underwent telephone interview only, 1 met DSM-IV criteria for Current PTSD, 5 for Past PTSD, and 31 for neither (Never had PTSD) related to their personal experiences with breast cancer, according to the PCL. Of those who were interviewed in person, 7 met criteria for current PTSD, 8 for past PTSD, and 35 for neither (i.e., Never), according to the CAPS. Because agreement was good between the PCL and CAPS (weighted κ=.57), PCL-classified patients were added to CAPS-classified patients to yield an estimated incidence of (current or past) breast cancer-related PTSD during the mean 20.5 (*SD* 7.6, range 11.2-44.2) months following tissue diagnosis of 24% (21/87), and a point prevalence of current PTSD at the time of interview of 9% (8/87).

Thirty-seven patients who completed the CAPS (5 Current, 7 Past, 25 Never) agreed to participate in psychophysiologic testing. Their demographic, psychometric, and psychophysiologic response data appear in Table 1, along with the results of ANOVAS. Heart rate (HR), skin conductance (SC), lateral frontalis (LF) and corrugator (C)

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electromyographic (EMG) responses during patients' personal script-driven imagery of their breast cancer experiences were entered as simultaneous dependent variables into a MANOVA, which yielded an overall significant group effect: $F(8,62)=2.5$, $p=.02$. As shown in Table 1, Current patients showed statistically larger HR, SC, and C-EMG responses than both Past and Never patients. The Current patients' mean physiologic responses were comparable to those observed in persons with PTSD from other traumatic events.[4-7]

Pearson product-moment correlations between current CAPS score and physiologic responses across all patients were significant for all physiologic variables: HR $r=.38$ ($p=.02$); SC $r=.34$ ($p=.04$); LF-EMG $r=.34$ ($p<.05$); C-EMG $r=.55$ ($p<.001$).

Results: Witnesses. Twenty-four witnesses agreed to undergo the CAPS. An additional 7 agreed to the telephone interview only. Of the latter, 0 met DSM-IV criteria for Current PTSD, 1 for Past PTSD, and 6 for neither (i.e., Never) related to their personal experiences with breast cancer, according to the PCL. Of those who were interviewed in person, 1 met criteria for current PTSD, 5 for past PTSD, and 18 for neither (i.e., Never), according to the CAPS. PCL-classified witnesses were added to CAPS-classified witnesses to yield an estimated incidence of (current or past) breast cancer witnessing-related PTSD during the mean 20.5 (*SD* 7.6, range 11.2-44.2) months following tissue diagnosis of 23% (7/31), and a point prevalence of current PTSD at the time of interview of 3% (1/31).

Twenty-three witnesses (1 Current, 5 Past, 17 Never) agreed to participate in psychophysiologic testing. Their demographic, psychometric, and psychophysiologic response data appear in Table 2. Because there was only one witness in the Current category, data from the Current and Past witnesses were combined and compared with the data from the Never witnesses. Heart rate (HR), skin conductance (SC), lateral frontalis (LF) and corrugator (C) electromyographic (EMG) responses during personal script-driven imagery of their experiences with witnessing breast cancer were entered into MANOVA, which yielded an overall significant psychophysiologic group effect: $F(4,18)=6.8$, $p=.002$. As shown in Table 2, Current/Past witnesses showed statistically larger SC responses than Never witnesses.

Pearson product-moment correlations between current CAPS score and physiologic responses across all witnesses

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were: HR r=.21 (p=.32); SC r=.54 (p=.009); LF-EMG r=.40 (p=.06); C-EMG r=.07 (p<.76), i.e., statistically significant for SC.

7. CONCLUSIONS

The experience of being diagnosed with and treated for breast cancer appears to be capable of causing PTSD. The lifetime PTSD incidence of 24% is in the range of that observed from other traumatic events.[9] Significantly elevated physiologic responding during script-driven imagery of personal breast cancer experiences in participants with PTSD, and significant positive correlations between current CAPS scores and physiologic responses, support the validity of the PTSD observed in this population. Furthermore, patients' breast cancer events also appear capable of causing psychophysiologically positive PTSD in their witnesses.

A limitation of this study is incomplete recruitment from the pool of potential patient candidates, largely due to the unanticipated refusal of the local IRB to allow the investigators to contact patients directly (even though a State law permitted this). This resulted in smaller sample sizes than originally anticipated, introduced potential recruitment biases, and limited statistical power. Therefore, these results should be regarded as tentative pending replication. Institutional Review Boards reviewing proposals for such research in the future should weigh the risk to patients entailed by limited infringements on confidentiality against the loss to science and to the diagnosis and treatment of future patients entailed by recruitment restrictions.

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Principal Investigator: Roger K. Pitman, M.D.

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9. MEETING ABSTRACT

Lanes D, Williston S, Metzger L, Orr S, Pitman R. Incidence and Psychophysiology of PTSD in breast cancer patients. International Society for Traumatic Stress Studies Annual Meeting 15:186.

10. PUBLICATIONS

In preparation

11. PERSONNEL RECEIVING PAY DURING GRANT PERIOD

Maureen Clark
Heike Crouteau
Douglas Lanes
Diane Leduc
Lauren McLaughlin
Linda Metzger
Nina Murray
Scott Orr
Roger Pitman
Karen Sheldon
Stephanie Williston

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Table 1. Group Means, Standard Deviations, and Results of Analyses of Variance (ANOVAs) and Post Hoc Comparisons for Demographic, Psychometric, and Psychophysiologic Response Measures in Breast Cancer Patients

Table 2. Group Means, Standard Deviations, and Results of *t*-tests for Demographic, Psychometric, and Psychophysiologic Response Measures in Breast Cancer Witnesses

Table 1. Group Means, Standard Deviations, and Results of Analyses of Variance (ANOVAs) and Post Hoc Comparisons for Demographic, Psychometric, and Psychophysiologic Response Measures in Breast Cancer Patients

	CURRENT ($n = 5$)		PAST ($n = 7$)		NEVER ($n = 25$)		ANOVA			POST HOC COMPARISONS
Variable	*M*	(*SD*)	*M*	(*SD*)	*M*	(*SD*)	*F*	(*df*)	*p*	
Demographics										
Age (years)	45.2	(6.6)	46.4	(5.9)	57.3	(16.0)	2.7	(2,33)	ns	
Mos. since Diag.	19.0	(4.1)	18.6	(6.9)	20.9	(9.1)	<1	(2,33)	ns	
Education (years)	14.2	(3.6)	14.0	(2.2)	13.8	(2.8)	<1	(2,30)	ns	
Psychometrics										
CAPS Total	92.6	(28.4)	20.7	(18.3)	11.3	(12.0)	53.1	(2,33)	<.001	C> P,N
CAPS B	29.8	(8.9)	4.7	(4.7)	1.9	(3.5)	72.4	(2,33)	<.001	C> P,N
CAPS C	38.0	(11.6)	10.3	(12.4)	3.5	(5.7)	36.7	(2,33)	<.001	C> P,N
CAPS D	24.8	(12.4)	5.7	(4.6)	5.9	(6.3)	15.5	(2,33)	<.001	C> P,N
Mississippi Scale	111.8	(26.8)	73.3	(16.8)	67.1	(13.4)	15.5	(2,31)	<.001	C> P,N
IES Total	53.8	(34.9)	17.3	(9.7)	5.5	(8.7)	19.8	(2,29)	<.001	C> P,N
IES Intrusion	14.9	(13.3)	7.0	(6.8)	1.6	(1.7)	10.4	(2,29)	<.001	C> P,N
IES Avoidance	18.0	(10.8)	7.3	(2.9)	2.7	(4.7)	14.8	(2,29)	<.001	C> P,N
IES Arousal	20.9	(13.9)	7.0	(6.8)	1.2	(2.9)	22.5	(2,29)	<.001	C> P,N
SCL-90-R (GSI)	1.7	(1.1)	0.4	(0.3)	0.2	(0.2)	20.9	(2,32)	<.001	C> P,N
STAI (Trait)	54.3	(13.4)	35.7	(10.9)	30.0	(8.5)	11.3	(2,31)	<.001	C> P,N
MCSDS	15.0	(1.2)	15.3	(5.2)	19.8	(6.6)	2.2	(2,32)	ns	
Phys Responses										
Heart Rate	10.5	(12.6)	1.0	(4.4)	2.5	(3.5)	5.1	(2,34)	.01	C>P,N
Skin Condctnce	1.9	(2.5)	0.7	(1.0)	0.2	(0.6)	5.5	(2,34)	.009	C>P,N
Frnt. EMG	1.9	(3.4)	0.9	(1.3)	0.7	(1.5)	<1	(2,34)	ns	
Corr. EMG	9.0	(9.3)	2.4	(2.1)	1.9	(2.4)	6.9	(2,34)	.003	C>P,N

Note. CAPS= Clinician-Administered PTSD Scale; Mississippi Scale= Civilian Mississippi Scale; IES= Impact of Events Scale; SCL-90-R (GSI)= Symptom Checklist-90-Revised (General Symptom Index); STAI= Spielberger State-Trait Anxiety Inventory; MCSDS= Marlowe Crowne Social Desirability Scale; Post Hoc Test=Ryan-Einot-Gabriel-Welsch Multiple Range Test.

Table 2. Group Means, Standard Deviations, and Results of *t*-tests for Demographic, Psychometric, and Psychophysiologic Response Measures in Breast Cancer Witnesses

Variable	CURRENT + PAST ($n = 6$) *M*	*(SD)*	NEVER ($n = 17$) *M*	*(SD)*	*t(21)*	*p*
Demographics						
Age (years)	48.7	(10.3)	53.2	(11.1)	0.9	.39
Education (years)	15.0	(3.9)	14.5	(2.2)	0.4	.69
Psychometrics						
CAPS Total	34.8	(17.1)	5.7	(7.2)	5.9	<.001
CAPS B	11.3	(7.6)	1.2	(2.3)	5.0	<.001
CAPS C	8.7	(7.8)	1.9	(4.0)	2.7	.01
CAPS D	14.8	(10.7)	2.5	(4.1)	4.1	<.001
Mississippi Scale	78.3	(23.5)	60.8	(13.0)	2.3	.04
IES Total	23.8	(11.8)	4.3	(4.3)	5.8	<.001
IES Intrusion	7.7	(4.7)	1.7	(2.3)	4.0	<.001
IES Avoidance	11.3	(5.4)	2.1	(2.0)	6.0	<.001
IES Arousal	4.8	(4.4)	0.5	(1.2)	3.6	.002
SCL-90-R	0.7	(0.6)	0.2	(0.2)	3.0	.006
STAI (Trait)	41.7	(11.4)	30.9	(8.0)	2.5	.02
MCSDS	15.7	(8.0)	21.2	(7.5)	1.9	.07
Physiologic Responses						
Heart Rate	2.3	(3.4)	2.0	(4.3)	0.2	.88
Skin Conductance	1.16	(1.51)	0.08	(0.51)	2.6	.02
Frontalis EMG	1.5	(3.2)	0.2	(1.1)	1.4	.17
Corrugator EMG	0.5	(2.3)	0.8	(1.1)	0.4	.71

Note. CAPS= Clinician-Administered PTSD Scale; Mississippi Scale= Civilian Mississippi Scale; IES= Impact of Events Scale; SCL-90-R (GSI)= Symptom Checklist-90-Revised (General Symptom Index); STAI= Spielberger State-Trait Anxiety Inventory; MCSDS= Marlowe Crowne Social Desirability Scale; Post Hoc Test=Ryan-Einot-Gabriel-Welsch Multiple Range Test.

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