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THE RELATIONSHIP BETWEEN TRAUMA, PTSD, AND MEDICAL UTILIZATION IN THREE HIGH RISK MEDICAL POPULATIONS*

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ABSTRACT

Objective: Increased use of medical and psychiatric services has been reported as a correlate of exposure to trauma. Recent studies suggest that: 1) physical and sexual abuse traumas are particularly associated with increased utilization and 2) posttraumatic stress disorder (PTSD), a common sequela of abuse, mediates the relationship between trauma exposure and

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elevated utilization. The goal of this study was to explore the relationships between trauma, abuse, PTSD, and medical utilization in three medical help seeking groups reported to be at high risk for trauma exposure. *Method:* One hundred and seven patients receiving care at a university-affiliated medical center were surveyed for trauma history and PTSD using the Trauma History Questionnaire (THQ) and the PTSD Checklist (PCL). The sample included: forty-eight gynecologic outpatients, thirty-five inpatients with seizure disorders, and twenty-four psychiatric inpatients with non-PTSD admitting diagnoses. Medical utilization data were obtained from a computerized medical center data base. *Results:* Ninety-six patients reported a trauma history. Of these patients, sixty-six reported abuse and forty-five qualified for PTSD diagnoses. Total number of traumas and reported sexual and physical abuse correlated significantly with elevated medical utilization and PTSD prevalence. PTSD diagnosis was not significantly correlated with utilization, but the five highest utilizers received PTSD diagnoses. *Conclusions:* Study results supported hypotheses regarding the relation of trauma exposure to medical utilization, but were less clear about the mediating role of PTSD. These findings suggest that routine screening of high-risk patient groups might promote timely identification of trauma history and PTSD, and subsequently impact health care utilization.

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Key Words: PTSD, abuse, trauma, medical utilization

INTRODUCTION

Trauma survivors appear to be disproportionate users of the health care system, presenting to medical and psychiatric facilities with diverse physical and emotional symptoms [1-3]. History of trauma exposure has been associated with multiple psychological and physical conditions including: chronic pelvic pain, gastrointestinal disorders, anxiety, depression, substance use disorders, dissociation, and posttraumatic stress disorder (PTSD) [1, 4]. While current research has not shown definitive links between trauma exposure and *specific* long-term medical illnesses, there is growing evidence that people who have experienced trauma, and particularly those who develop PTSD, exhibit comorbid health conditions previously seen as separate and unrelated [3, 4]. Reviewing findings on the relationship of trauma, PTSD, and physical health, Friedman and Schnurr [4] suggest that PTSD is an important mediator through which psychological trauma may relate to increased risk of adverse health outcomes. Somatization was found in one study to be ninety times more likely in patients with PTSD than patients without the disorder [1]. Individuals with PTSD are as likely to seek treatment from medical as from mental health providers and PTSD is a disorder that can become a chronic condition. More than one third of people with an index episode of PTSD fail to recover even after many years [1, 5, 6].

The goal of this study was to explore the relationships between trauma, abuse, PTSD, and medical utilization in three medical help seeking groups reported to be at high risk for trauma exposure: gynecologic patients, seizure disorder patients, and psychiatric patients. We chose these groups because past studies have reported relatively high rates of psychological trauma, adult and child physical and sexual abuse, and PTSD in these populations [7-14]. This allowed us to find a sufficient number of child and adult trauma survivors, and clients meeting diagnostic criteria for PTSD, to test the study hypotheses. PTSD is, itself, a frequent long-term correlate of the trauma of childhood sexual abuse, particularly for help seeking women [15, 16]. Women presenting at gynecologic health services for routine exams and PAP smears report rates of lifetime abuse histories of approximately 50 percent [14]. Several studies of patients with PMS and chronic pelvic pain found even higher rates of abuse than those reported for women presenting for annual examinations [12, 17, 18]. In two widely cited studies, severe trauma histories and lifetime PTSD were identified in patients with epilepsy disorders and particularly in patients with psychogenic non-epileptic seizures (NES). The mean rate of reported trauma exposure was approximately 87 percent and the rate of lifetime PTSD was approximately 38 percent for NES patients [8, 13]. Other research has specifically suggested correlations between a diagnosis of NES and a history of sexual and physical abuse [19, 20]. High prevalence of childhood sexual abuse, other abuse traumas, and PTSD has also been found in inpatient psychiatric populations and in persons with severe mental illness [9, 11, 21]. Reported trauma exposure in psychiatric populations ranges from about 50 to over 90 percent in multiple studies, and prevalence of PTSD has been reported at approximately 40 percent [21, 22].

Trauma survivors, particularly people exposed to physical and sexual abuse, have exhibited elevated medical utilization [1, 3, 14, 23, 24]. Golding et al. found that women with sexual abuse histories sought medical services twice as often as women reporting no abuse and were twice as likely to seek care for *physical* rather than emotional distress [23].

METHOD

Between March 1995 and November 1996, we used standardized instruments to survey three high-risk help-seeking populations from a single medical facility. We assessed all three groups of patients for trauma exposure, sexual and physical abuse, and PTSD. None of the patients in any group was specifically being treated for trauma or direct trauma sequelae (e.g., PTSD, head injury, or contusions following trauma). We hypothesized that: 1) trauma exposure would be correlated with medical utilization, 2) physical and sexual abuse would be the trauma types most highly correlated with increased utilization, and 3) PTSD prevalence would predict elevated medical utilization across populations.

Subjects

We surveyed 107 (22 male and 85 female) patients receiving treatment at Dartmouth-Hitchcock Medical Center (DHMC), a rural, university-affiliated medical center serving patients from all over New England. Patients were eligible for participation if they were over eighteen and able to write, understand the survey questions, and give informed consent. Subjects were ruled out of the study if they were pregnant and if medical illness, intellectual limitations, or psychosis made it impossible for them to give informed consent and to fill out the questionnaires.

There were forty-eight female gynecologic outpatients, twenty-four psychiatric inpatients (7 men and 17 women), and thirty-five inpatients with seizure disorders (19 women; 16 men) recruited for the study. Subjects from the two inpatient populations (seizure and psychiatric disorders) included all consecutive, consenting admissions during the study period. The seizure disorder patients presented for diagnostic assessment of intractable seizures, including a medical history, psychological assessments, and a 21-channel scalp EEG with simultaneous video monitoring and recording of typical spontaneous seizures. The psychiatric patients were admitted for brief hospitalizations on a psychiatry-medicine unit specializing in comorbid medical and psychiatric disorders. Most patients were hospitalized as a crisis intervention, e.g., for acute depression and suicidal risk. None was hospitalized because of an identified post-abuse reaction, nor because of symptoms identified as PTSD. The outpatient (gynecologic) population included all consecutive, consenting women with scheduled clinic appointments during the study period.

Procedures

Referrals to the study were made by attending physicians and nurses. Patients were then approached by experienced clinical interviewers. Over 85 percent consented to participate. Patients were told that this was a study of the possible impact of stressful life experiences on health. They were also informed that all information was kept confidential. After informed consent was obtained, the questionnaires were completed either in hospital (inpatient populations) or, in the case of the gynecologic group, mailed back to the researchers in stamped, addressed envelopes. Researchers were blind to patients' histories, presenting problems, and past and current medical, neurological, and psychiatric diagnoses.

Medical utilization data was obtained from a computerized medical center database which provided a detailed encounter index. We calculated number of visits with health care providers throughout the hospital but did not have data on non-hospital health care utilization. If there was more than one hospital encounter on a given day, we counted as separate only encounters that related to separate medical problems. For example, we did not count laboratory tests and x-rays that related to an appointment with a single medical provider as separate encounters.

Encounters were charted for a period of two years—one year before and including the date of the survey and one year after the survey.

Assessment of Trauma

Lifetime exposure to traumatic events was assessed with the Trauma History Questionnaire (THQ) [25]. The THQ asks subjects to endorse events from a comprehensive list of traumas. This list corresponds to DSM-IV Criterion A "traumatic events" which are a specific set of inherently stressful experiences; endorsement of one of which is a necessary precondition for diagnostic assessment of PTSD [26]. Infertility, mental illness, or the perceived stigmatization and handicapping effects of having seizures are non Criterion A traumas and are not assessed by this questionnaire.

The THQ consists of twenty-four items within three categories of traumatic events—crime related events, general disaster, and trauma (e.g., car accidents, hurricanes, unexpected death of a spouse)—and unwanted physical and sexual experiences. Abuse questions on the THQ are behaviorally specific and avoid use of words such as "abuse" [25]. In the standard format, each respondent is asked to report the number of times she/he experienced the endorsed traumatic event and at what age. We modified the format somewhat, asking each subject to report whether the event was a one-time or multiple occurrence and specifically whether exposure to the traumatic event(s) occurred before or after age sixteen.

Assessment of PTSD

PTSD is the best delineated psychological sequela of directly undergoing or witnessing traumatic events. The Diagnostic and Statistical Manual of Mental Disorders, 4th Edition (DSM-IV) definition of PTSD includes having: "experienced, witnessed, or [been] confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of others, and responding with intense fear, helplessness, or horror" [26, pp. 427-428]. Symptoms include the reexperiencing of the traumatic event, avoidance of stimuli associated with the trauma or psychic numbing, and increased arousal.

PTSD was assessed with the PTSD Checklist (PCL) [27]. The PCL is a self-report rating scale consisting of seventeen items that correspond to the DSM-IV symptoms of PTSD. There are three categories of symptoms (hyperarousal, intrusive symptoms, and avoidance symptoms) covering the necessary DSM-IV criteria for diagnosing PTSD. Subjects indicated on an anchored 5-point scale the degree of distress they experienced for the different symptoms in the past three months. For the purposes of establishing a PTSD diagnosis, symptoms rated as "moderately severe" or more severe were classified as "present." The PCL has good reliability and convergent validity with "gold standard" structured interviews for PTSD [28]. Correlation between the PCL using a cutoff score of 44

and the "gold standard" Clinician Administered PTSD scale (CAPS) has been reported to exceed .90 [29].

Analysis

Statistical analysis included several stages. First, correlations were computed between the hypothesized variables and the primary outcome measure. A Student's *t*-test (two-tailed) was used to test the significance of these correlations for the sample as a whole. Second, we used multiple regression procedures to determine which of the independent variables best predicted total medical utilization. Third, using a stem and leaf procedure, we examined hospital utilization as a function of PTSD status [30]. Finally, we used Levene's Test for Equality of Variances to compare the variance in hospital utilization as a function of PTSD status [31]. For all analyses, a p value less than 0.05 was considered statistically significant.

RESULTS

Descriptive Statistics

Mean age was forty-one (SD = 14). Ages ranged from twenty to eighty-one years and there were no significant differences between ages for the three patient subgroups. Mean ages for the subgroups were as follows: gynecologic: 39 (SD = 11); seizure disorders: 39 (SD = 13); and psychiatric inpatients: 48 (SD = 17). The gynecologic sample included, in approximately equal proportions, women presenting for three types of appointments: annual examinations, infertility consultations, and other gynecological problems (e.g., infections, pelvic pain). In the seizure disorder sample, twenty-seven patients post study recruitment received discharge diagnoses of epilepsy, while eight patients were discharged with diagnoses of NES. The psychiatric inpatients were discharged with predominantly affective diagnoses including: major depression, bipolar disorder, postpartum depression, and organic mood disorder. Seven of the twenty-four patients in the sample were discharged post study recruitment with a diagnosis of PTSD or subthreshold PTSD.

Trauma, Abuse, and PTSD in the Total Population

We found high rates of multi-traumatization and abuse across all three of our patient groups. The lifetime prevalence of trauma for the total study population was 89 percent, with 96 of 107 subjects endorsing at least one Criterion A trauma (Table 1). Abuse histories (physical and sexual) were reported by 62 percent of our sample. Child abuse histories were reported by 45 percent of the subjects. Subjects acknowledged incidents of coercive intercourse, oral or anal sex, coerced touching of private body parts, other forced and unwanted sexual contact, attacks with weapons, and beatings leading to serious injury. Aside from

Table 1. Percentage and Mean Number of Total Traumas, Abuse Traumas, and PTSD in Total Population and by Patient Groups

	Total Pop. (*N* = 107)		Gynecology (*N* = 48)		Seizure D/0 (*N* = 35)		Psychiatry (*N* = 24)	
	%	Mean	%	Mean	%	Mean	%	Mean
Total Tr	89 (*N* = 96)	5.9	92 (*N* = 44)	4.6	89 (*N* = 34)	6.4	87 (*N* = 21)	6.6
Abuse Tr	62 (*N* = 66)	2.5	58 (*N* = 28)	1.9	51 (*N* = 18)	2.3	83 (*N* = 20)	3.3
PTSD (PCL)	42 (*N* = 45)	8.2	19 (*N* = 9)	7.7	51 (*N* = 18)	9.0	75 (*N* = 18)	7.8

abuse traumas, subjects commonly reported other types of criminal victimization, unexpected deaths of significant others and serious motor vehicle accidents. Forty-two percent of the total study group met DSM-IV criteria for a diagnosis of PTSD. All three patient groups were high on trauma exposure, with the psychiatric patients reporting the highest rates of abuse traumas.

Table 1 shows the percentages, mean number of total traumas, abuse traumas, and PTSD for the total study population and the three subgroups. The average number of traumatic experiences reported for all subjects was 5.9, far exceeding the national norms. Only 10 percent of the men and 6 percent of the women in the general population report lifetime experiences of more than four Criterion A traumas [1].

In our study population, subjects with PTSD averaged 8.2 traumas, while subjects without PTSD averaged 3.5. Study results showed considerable variability in the prevalence of PTSD between the three patient groups, with some groups at much higher risk for the disorder. The psychiatric patients were one-and-one-half times more likely to meet PTSD criteria than the seizure disorder patients, and almost four times more likely to do so than the gynecologic patients. Although psychiatric patients actually had the lowest reported prevalence of ever having experienced a Criterion A trauma, they had by far the highest rate of PTSD of the three patient groups. The gynecologic group, in contrast, had the highest rate of exposure to trauma, but only about one-quarter of the rate of PTSD.

Table 2 shows correlation coefficients for the total study population ($N = 107$) for total traumas, abuse traumas, PTSD, and medical utilization.

Hypothesis 1 was supported by the study results. The total number of traumas was found to be significantly correlated with medical utilization ($r = .297$; $p = .002$) for the sample as a whole. There were no significant differences between the three patient populations in total medical utilization. Over the two-year period surveyed, mean number of visits was 13.78 ($SD = 1.23$). Actual survey

Table 2. Correlation Coefficients between Total Trauma, Abuse Traumas, PTSD, and Medical Utilization in Total Study Population

	Total Tr	Abuse Tr	PTSD	Med Utilization
Tot Tr	—	.859 (p = .000)	.487 (p = .000)	.297 (p = .002)
Abuse Tr	.859 (p = .000)	—	.461 (p = .000)	.291 (p = .002)
PTSD	.487 (p = .000)	.461 (p = .000)	—	.134 (p = .169)
Med Util	.297 (p = .002)	.291 (p = .002)	.134 (p = .169)	—

administration appeared to have no effect on reported utilization in any of the three patient populations. There was no significant difference between rates of medical utilization pre and post the survey administration. Evidence for Hypothesis 2 was mixed. The total number of sexual and physical abuse traumas was significantly correlated with medical utilization ($r = .291$; $p = .002$). The age of reported abuse trauma (childhood vs. adult) did not appear to affect utilization, probably because of the high correlation between reported child and adult abuse. Of the sixty-six subjects reporting abuse, 35 percent ($N = 23$) reported both child and adult abuse. The relationship between total traumas and abuse traumas was, moreover, complicated in that we also found that subjects with histories of sexual and physical abuse had three times more *nonabuse* traumas than did subjects without abuse histories (4.3/1.6). Hypothesis 3 was not supported. Although the correlation between PTSD and medical utilization ($r = .134$) was in the predicted direction, we did not find a significant relationship between these two variables ($p = .169$).

Next we performed a multiple regression analysis to determine the unique contribution of the independent variables to total medical utilization. Only the total number of traumas entered this equation, and significantly contributed to the prediction of medical utilization ($F(1,105) = 10.16$, $p = .002$). We investigated whether there was a bi-modal relationship between PTSD and utilization such that subjects with PTSD were either very high or very low utilizers. There was a significant difference in variance of use (Levene's $F(61,44) = 7.83$, $p = .006$) between those with and without PTSD. However, this difference was driven solely by five very high utilizers with PTSD, not by a tendency for those with PTSD to exhibit a bi-modal pattern of utilization. The five highest utilizers averaged fifty-seven incidents of medical utilization during the index period, as opposed to a

mean of 13.78 in the study population as a whole. Of these high utilizers, there were four females and one male, three psychiatric inpatients, one NES patient, and one gynecologic patient. All reported abuse (4 physical and sexual abuse; 1 sexual abuse only; 4 reported that abuse occurred in childhood). The five highest utilizers averaged 11.6 total traumas (population mean for PTSD subjects was 8.2), and also had more than double the population mean for number of abuse traumas (5.8 vs. 2.5).

DISCUSSION

As in previous studies surveying high-risk medical populations, we found high rates of trauma exposure, both in terms of number and severity, in comparison with national and community surveys. Although exposure to one traumatic event may be fairly commonplace, with over half of all adults in the general population reporting experiencing at least one lifetime traumatic event, multi-traumatization and exposure to the most toxic forms of trauma, are far less prevalent [5]. The rates of trauma exposure and PTSD reported in our sample were quite high, and thus may seem surprising. However, they fall within the range reported by previous studies of specific clinical populations using parallel methods. There are a number of reasons why rates of trauma exposure in clinical populations may often be underestimated. They include the variability in legal and research definitions of sexual and physical abuse, insensitive assessment tools for detection, the common use of vague and non-behaviorally specific questions about abuse, as well as patients' reluctance to disclose stigmatized behaviors [16]. Consistent with past studies, in both general and help-seeking populations, we found that the number, type, and severity of the trauma(s) were associated with more negative outcomes [32].

Our study results add to previous findings suggesting that number and type of traumatic events are related not only to anxiety disorders such as PTSD, but also to rates of physician visits and utilization of medical care [33]. The survey responses of gynecologic, seizure disorder, and psychiatry patients suggest that trauma number and type can have a strong impact on the amount of medical utilization across a variety of presenting problems and diagnoses. We found support for the hypotheses that total traumas and abuse traumas were both significantly correlated with medical utilization in the surveyed high-risk patient groups. We did not find support for the hypothesis that the age of reported abuse trauma (childhood vs. adult) affected utilization. The mediating effects of PTSD on medical utilization are not as clear from our data, but PTSD following severe abuse traumas appears to be associated with help-seeking behavior in very high utilizers. The relationships between elevated utilization, a history of multiple abuse traumas, and PTSD diagnosis need further exploration with larger, more diverse populations. Likewise, the impact of child sexual and physical abuse versus adult sexual and physical abuse on utilization requires more study. Although we did not find a significant correlation between age of abuse and

utilization, this may reflect sampling limitations or lack of statistical power to test this hypothesis.

Certainly, surveying help-seeking clients from only three specialty service sites at a single medical center cannot yield definitive results and the lack of utilization data from medical contacts outside the center is clearly a limitation of the study. However, the use of a relatively large sample with multiple presenting complaints and standard assessment tools for trauma, abuse, and PTSD, does provide additional information on relationships between trauma exposure, PTSD, and health care utilization in high-risk groups.

We also found that total number of traumas reported by our study population correlated significantly with PTSD diagnosis ($r = .487$; $p = <.001$). While multi-traumatization appears to increase vulnerability to this disorder, the variability of PTSD prevalence in our three groups seems to reflect the diversity in outcomes following trauma exposure. Some medical populations, such as our gynecologic patients, may be more likely to show somatization symptoms, stress-related health problems or other secondary effects of trauma exposure which drive health care utilization, without developing PTSD. These findings may relate to the potential impact of other factors on the degree and type of negative reactivity to trauma exposure. For example, pre-existing coping styles, personality traits, and vulnerabilities (degree of psychological hardiness) may be either risk or protective factors for developing PTSD following trauma exposure [32].

Other Implications of Findings

Only a minority of people with PTSD seek professional help and medical care providers, rather than mental health care providers, are the most likely to see people with trauma and PTSD [1]. While sleep problems, somatic complaints, dissociation, conversion reactions, substance use disorders, and emotional disturbances can be comorbid with many psychiatric and physical conditions, they are common correlates of trauma exposure and PTSD. Help-seeking individuals with such presenting problems may not understand or acknowledge the relationship of their physical or mental complaints to past trauma exposure. Since there are specific, effective psychiatric treatments available for alleviating PTSD symptoms, it can be valuable for medical care providers to identify and refer cases and medical populations (such as epilepsy patients) in which PTSD appears prevalent. Efficacy rates for these treatments are reported to be in the range of 50 percent, as measured by no longer meeting diagnostic criteria for PTSD [34-38].

In addition, there is growing evidence that traumatic experiences, abuse history, and PTSD symptomatology may strongly affect patient-provider interactions during health care visits. This appears to be true whether or not providers ask about trauma or patients reveal traumatic histories [39]. Undisclosed sexual traumas may particularly impact clinical situations, raising patients' anxieties during routine

procedures such as physical examinations and preventing spontaneous disclosure of relevant medical symptoms. Evidence suggests that many patients actually prefer their physicians inquire about victimization experiences, but that providers' awareness of patients' past traumatization is limited [40]. Leserman et al. suggest that taking a trauma history, while not always a guarantee of disclosure of trauma, should be a part of intake assessment and medical history taking [7]. Using brief, self-report instruments such as the THQ and the PCL might provide an alternative way to enhance disclosure without creating an undue burden for patient or provider. Studies of the general population have noted measurable positive changes resulting from disclosure of diverse traumas: reduced health care utilization, increased perceived psychological well-being, and improved immune responses [41].

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