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Clinical Research

A Comparative Study of Trauma and Posttraumatic Stress Disorder Prevalence in Epilepsy Patients and Psychogenic Nonepileptic Seizure Patients

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Summary: *Purpose:* This study tests the hypothesis that trauma histories, including histories of physical and sexual abuse, and posttraumatic stress disorder (PTSD) are more prevalent in psychogenic non–epileptic seizure (NES) patients than in epilepsy patients.

Methods: Thirty-five inpatients with intractable seizures were evaluated for trauma history and PTSD. After these assessments, patients were diagnosed as having either epileptic or nonepileptic seizures through EEG monitoring.

Results: NES diagnosis correlated with PTSD and total number of lifetime traumas, adult traumas, and abuse traumas. Contrary to previous hypotheses, reported childhood sexual abuse (CSA) did not correlate significantly with NES diagnosis. However, CSA predicted PTSD in a discriminant analysis.

Conclusions: We found evidence for the hypothesized relations between trauma, abuse, PTSD, and NES diagnosis. However, elevated levels in both seizure-disorder groups suggest that routine assessment for abuse, trauma, and PTSD might facilitate medical care and treatment for all intractable seizure patients. **Key Words:** PTSD—Trauma—NES—Epilepsy—Abuse.

The purpose of this study was to compare prevalence of trauma exposure, sexual and physical abuse, and posttraumatic stress disorder (PTSD) in two seizure-disorder populations. We tested the hypothesis that trauma histories, including histories of physical and sexual abuse, and PTSD are more prevalent in psychogenic non–epileptic seizure (NES) patients than in epilepsy patients.

Psychogenic nonepileptic seizures are by far the most frequent nonepileptic conditions seen in epilepsy centers, NES patients accounting for approximately half of inpatient and one fifth of outpatient epilepsy visits (1,2). NESs can be defined as behavioral events that resemble epileptiform seizures but are without identifiable physiological cause. Historically, many hypotheses have been put forth to link the NES syndrome to comorbid psychiatric disorders or particular psychological profiles. Although there has been no confirmation of a specific diagnostic link, many researchers have focused on the relation of trauma exposure and abuse history to NES symptoms. Female patients constitute 75 to 85% of diagnosed NES patients (3), and a number of recent studies have reported high rates of severe psychological trauma (particularly sexual and physical abuse traumas) in women with NES (1,3–10). Although fewer data are available on trauma in men with NES, there also are reports suggesting higher rates of abuse than for men in the general population (11). Several influential writers have hypothesized that NESs represent a particular form of psychological response to abuse (e.g., a type of dissociation or a conversion reaction) (1,5,6,9,12). Nash (12) stated that NESs should be properly thought of as dissociative phenomena generated by childhood trauma. Bowman (1) also concluded that NESs are expressions of dissociated memories of child abuse, triggered by recent stresses.

These findings are consistent with the growing psychiatric literature on the long-term effects of psychological trauma. Stress-related symptoms such as dissociation

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are commonly reported correlates of traumatization (13). Trauma exposure also has been correlated with increased prevalence of a variety of medical and psychiatric conditions including anxiety, depression, personality disorders, substance-use disorders, and somatiform disorders (14–16). Dissociation can be present in several psychiatric syndromes, including dissociative disorder per se, conversion disorder, or borderline and histrionic personality disorders. PTSD is the best delineated and most common psychiatric sequela of traumatic life events and the psychiatric disorder most explicitly tied, etiologically, to the psychophysiologic effects of directly experiencing or witnessing highly threatening events. As defined in the *Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV), dissociative symptoms also are commonly found in patients with PTSD and are closely related to both criterion B symptoms (e.g., dissociative flashbacks) and to criterion C "avoidant" symptoms (e.g., partial amnesia, denial of feelings, and estrangement/detachment) (17).

A few recent studies have examined the prevalence of PTSD in the intractable seizure population (1,4,5), but a computerized literature search revealed only one published study that has compared the prevalence of trauma, abuse, and PTSD in both NES patients and epilepsy patients. Bowman studied 27 NES patients, but did not compare them with epilepsy patients. She found that 88% of her subjects had sustained severe trauma. Seventy-seven percent of these subjects confirmed histories of sexual abuse, and 40% qualified for diagnoses of lifetime PTSD (1). Alper et al. compared 71 patients [57 NES-only patients and 14 patients with NES and complex partial epilepsy (CPE)], to 140 control patients with only CPE. The authors found frequency of sexual or physical abuse was significantly greater in the NES group (32%) than in patients with CPE, but they did not assess PTSD prevalence (9).

Arnold and Privitera (5) in a comparative study of trauma and PTSD in 41 epilepsy and NES patients, concluded that trauma history is significantly more likely in NES patients. The differences in prevalence of PTSD in the NES and epileptic seizure patients were in the hypothesized direction (36 vs. 15% lifetime PTSD; 14 vs. 3% current PTSD), but did not achieve statistical significance. This important study had a relatively small sample, and did not use standard, validated scales to assess either trauma exposure or PTSD. Our study potentially contributes to the understanding of trauma, abuse, and PTSD in NES and epileptic seizure patients by using a comparative design, standardized measures, and by assessing additional seizure disorder patients.

METHODS

Between 1995 and 1997, we compared male and female epilepsy patients and NES patients on measures of exposure to trauma, sexual and physical abuse, and PTSD to test the hypotheses that NES patients would exhibit an increased prevalence of (a) PTSD, (b) trauma exposure, (c) abuse traumas, and (d) child abuse.

We surveyed a group of 35 consecutive, consenting inpatients (19 women; 16 men) with intractable seizures hospitalized at Dartmouth-Hitchcock Medical Center (DHMC). DHMC is a rural, regional care center combining a hospital, a medical school (Dartmouth Medical School), and a clinic and serves patients from all over New England. The study subjects were representative of the patient population admitted to the hospital's Epilepsy Program. They had complicated diagnostic pictures, and they were hospitalized for a comprehensive evaluation, including a medical history and neuropsychological and psychosocial assessments. The psychological trauma and PTSD assessments were part of this standard evaluation for every patient admitted in the period covered by the study. Patients were surveyed immediately after admission and before clarification of their diagnoses by a 21-channel scalp EEG monitoring with simultaneous video monitoring. Standard diagnostic procedure included recording of at least three typical spontaneous seizures to confirm or rule out an identifiable physiological cause for the seizures. Interviewers were blind to previous medical, psychiatric, and neurologic diagnoses. After complete description of the study to the subjects, written informed consent was obtained.

Assessment of abuse, trauma, and PTSD

Separate measures were used to assess trauma exposure and PTSD symptoms because not all trauma or abuse victims, even those who exhibit psychiatric sequelae, develop PTSD (14–16).

Psychological trauma is usually defined as the experience of an uncontrollable event perceived to threaten a person's sense of integrity or survival (18–20). Lifetime exposure to traumatic events was assessed with the 24-item self-report Trauma History Questionnaire (21). The THQ asks subjects to endorse events from a comprehensive list of traumas identified in DSM-IV as meeting the criterion A definition of "traumatic event" (17). Criterion A traumas are a specific set of inherently stressful experiences, endorsement of one of which is considered a necessary precondition for diagnostic assessment of PTSD. Intractable seizures, per se, were not counted as meeting the DSM-IV definition of criterion A, nor were stressful events associated with seizures.

The THQ is divided into three event categories: crime-related events, general disaster and trauma, and unwanted physical and sexual experiences. For an experience to qualify as a criterion A trauma, subjects must endorse: (a) experiencing the event, and also (b) an intensely negative emotional response such as terror or

perceived threat of self-injury, death, or serious harm to others (17).

Although research, clinical, and legal definitions of abuse vary, physical abuse is commonly defined as an act intended to produce severe pain or injury, including repeated slapping, kicking, beating, and threatening with or using a weapon. Sexual abuse is commonly defined as forcible touching of breasts or genitals, forcible intercourse, or being forced to stimulate a perpetrator's genitalia. Childhood abuse usually refers to events before age 16 or 18 years, and sexual contact between a child and a person ≥5 years older is commonly defined as abusive (22).

THQ questions in the sexual or physical abuse category correspond to the commonly defined abusive experiences of forcible acts with intention to harm or produce injury. The six THQ questions on physical and sexual experiences are behaviorally specific and avoid use of words such as "abuse" (21). The THQ also measures revictimization. We modified the standard format somewhat, asking each subject to report whether the event was a one-time or multiple occurrence and whether exposure to the traumatic event(s) occurred before or after age 16 years.

Assessment of PTSD

The DSM-IV diagnostic criteria for PTSD require 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" (17) (pp. 427–428). Symptoms include the reexperiencing of the traumatic event (i.e., through images, dreams, or distress at exposure to cues that evoke the event), avoidance of stimuli associated with the trauma or psychic numbing, and increased arousal. These symptoms must persist for ≥1 month, and a clinically significant level of symptomatic intensity must be present (17). Sexual abuse, occurring either in childhood or in adulthood, generally meets the traumatic event criterion for PTSD, and researchers have found that PTSD is a common long-term correlate of childhood sexual abuse, particularly in women (14,15,23,24).

PTSD was assessed with the PTSD Checklist (PCL) (25). The PCL is a self-report rating scale consisting of 17 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 are instructed to indicate, on an anchored 5-point scale, the degree of distress they have experienced for the different symptoms at a specified time interval, in this study, 3 months.

For the purposes of establishing a PTSD diagnosis, symptoms that were rated as "moderately severe" or more severe were classified as "present." The PCL has good reliability with structured interviews for PTSD. Blanchard et al. (26) validated the psychometric properties of the scale for a sample of sexually assaulted women and male and female motor vehicle accident victims. Results of the Blanchard study showed a 0.929 correlation between the PCL (using the "moderately severe" cut point) and the Clinician Administered PTSD Scale (CAPS), which is considered the gold-standard measure for diagnosing PTSD (27). CAPS administration often takes well in excess of 1 h and can be emotionally distressing to subjects. We chose to use the PCL because of its brevity, its excellent sensitivity/specificity for detecting PTSD, and because the clinical circumstances of the assessment argued for minimizing patient burden.

Statistical analysis

A Student's one-tailed t test was used to compare the means of the variables for the two groups (those with epilepsy and NES patients). A Fisher's Exact Test was used to compare proportions of PTSD. For all statistical analyses, a p value <0.05 was considered statistically significant. We used one-tailed tests because we had predicted the NES group to be higher on each of the variables. The variables analyzed are shown in Table 1. They are not all independent of one another but are included to

TABLE 1. *Trauma exposure and PTSD prevalence by seizure group*

	Epileptic (n = 27)		NES (n = 8)		
Variable	Mean	SD	Mean	SD	p Value
Total traumas	5.30	4.20	10.30	6.10	0.007
Child physical traumas	0.44	0.97	1.75	2.25	0.08
Child sexual traumas	0.59	1.10	1.00	1.50	0.20
Child abuse traumas	1.04	1.81	2.75	3.20	0.09
Child nonabuse traumas	0.59	1.22	1.25	1.28	0.09
Child total traumas	1.62	2.19	4.0	4.14	0.08
Adult abuse traumas	0.63	1.12	1.50	2.50	0.18
Adult nonabuse traumas	3.04	2.48	4.75	2.77	0.05
Adult total traumas	3.67	2.90	6.25	4.70	0.035
Total abuse traumas	1.67	2.40	4.25	3.80	0.05
PTSD	37% (10)		100% (8)		0.00

give a sense of the source of the differences between the groups. To examine the relations between the variables further, we also conducted two stepwise discriminant analyses, first with diagnosis (NES vs. epileptic seizures) and then with PTSD as the dependent variables.

RESULTS

Descriptive statistics

Mean age of subjects was 38 years (SD, 13). IQ scores ranged from 72 to 129, with the mean IQ being 92 (SD, 13). Mean education level was 13 years (SD, 1.7). Twelve women were married; seven were single. Eight men were married; eight were single. Occupations were primarily blue collar, but subjects ranged from unskilled laborers to corporate professionals. Fifteen subjects were currently working; 20 were not employed outside the home. Fourteen subjects were coded as disabled.

Twenty-seven study subjects (14 male; 13 female) received discharge diagnoses of epilepsy, whereas eight (six female; two male) were discharged with diagnoses of NESs. Twenty-four epilepsy patients were diagnosed with CPS, two with primary generalized seizures and one with simple partial seizures. Patients reported precipitating events such as encephalitis and meningitis, complicated febrile convulsions, birth trauma, and childhood accidents. In four of the cases, the seizures were of unknown cause.

Rates of trauma, abuse, and PTSD

Eighty-nine percent of all subjects reported trauma exposure; 51% of the subjects qualified for a diagnosis of lifetime PTSD. Fifty-one percent of all subjects also reported lifetime abuse traumas, and 43% reported child abuse traumas. Of the 16 male subjects, 38% reported lifetime abuse, and 31% reported child abuse. Of the 19 female subjects, 63% reported lifetime abuse, and 47% reported child abuse.

Whereas all the NES patients reported trauma and qualified for a PTSD diagnosis, 85% of the epilepsy patients also reported trauma, but only 37% qualified for a PTSD diagnosis. Both groups of seizure disorder patients (epilepsy patients and NES patients) were multitraumatized. Only four subjects did not endorse any traumas on the THQ.

Diagnostic groups did not differ by age (mean age: NES, 38.6 years; epilepsy, 39.0 years), and age was not significantly correlated with number of reported traumas. As Table 1 shows, all differences between the two groups were in the hypothesized direction, with the NES group reporting significantly ($p = 0.007$) more total lifetime traumas (10.3 vs. 5.3), traumas in adulthood (6.25 vs. 3.67), more abuse traumas (4.25 vs. 1.67), and a greater likelihood of meeting diagnostic criteria for PTSD (100 vs. 37%; $p = 0.000$).

Our subjects acknowledged incidents of coercive intercourse, oral and anal sex, coerced touching of private body parts, other forced and unwanted sexual contact, attacks with weapons, and beatings leading to serious injury. Forty-eight percent of epilepsy patients reported lifetime abuse traumas, and 62% of the NES patients reported lifetime abuse. Child abuse traumas were reported by 37% of the epilepsy patients and 50% of the NES group ($p = 0.09$). Group differences in prevalence of childhood sexual abuse per se also were in the hypothesized direction, but not significant ($p = 0.20$). Weaker support was found for the hypothesis that child abuse traumas, as opposed to other forms of trauma, were more highly correlated with NES, with child physical abuse showing a trend toward significance ($p = 0.08$). Adult abuse traumas (physical or sexual abuse) followed the same pattern; the NES group being higher on both measures, but not to a level that achieved statistical significance ($p = 0.18$). However, the majority of all abused subjects, NES patients, and epilepsy patients were abused *both* as children and as adults. Eighty-three percent of abused men and 75% of abused women had histories of both child and adult abuse.

We also entered the seven variables showing univariate differences into a stepwise discriminant analysis to predict membership in the NES or epilepsy seizure group. Using minimization of Wilks's lambda as the discriminant criterion, PTSD alone was the best predictor of group membership (71% correctly classified; $p = 0.001$). Given the importance of PTSD as a mechanism in predicting NES, we conducted a second discriminant analysis to assess which combination of trauma variables predicted PTSD among the intractable seizure patients. In this analysis, the seizure diagnosis (NES vs. epileptic seizures) and child sexual abuse correctly classified 86% of subjects ($p = 0.000$).

DISCUSSION

The results of our comparative study provide additional evidence in support of the hypotheses that trauma, abuse, and PTSD are related to NESs. NESs may be, for many patients, unrecognized sequelae of traumagenic experiences. Many researchers, from both the psychiatry and neurology disciplines, have offered hypotheses to explain the etiologic link between histories of sexual and physical abuse and NES (1,4,6,7,9,28). Although there is no consensus about the mechanisms by which abuse-generated emotional distress might become visibly manifested in NES, most hypotheses are based on more than a century-old psychodynamic or psychoanalytic theory of unconscious psychic conflict converted into somatic symptoms (9,28). Bowman (1), in her 1993 article, discussed how NES may be a "well suited" symptom for symbolically expressing the psychological traumatization resulting from both sexual and physical abuse.

In our study, evidence regarding a particularly strong relation between childhood sexual abuse and NES was more equivocal. However, our findings suggest that PTSD may be an important factor in the association between child sexual abuse and NES reported in earlier studies. NES patients who had had child sexual abuse were extremely likely to develop PTSD.

Although the prevalence of reported trauma history in our study subjects was congruent with the elevations seen in other medical populations, PTSD prevalence was higher than reported in previous studies of NES patients (1,4,5). No truly comprehensive data are available for making matched comparisons of NES patients with other categories of help-seeking patients in medical or psychiatric services. The most representative comparative data on rates and types of trauma and PTSD are probably found in the results of the 1995 National Comorbidity Survey (NCS), a representative sample of the U.S. adult population (14). Rates of lifetime trauma in the general population were shown in this survey to be high; more than half of all adults in the United States have experienced at least one traumatic event (14). The 1995 NCS estimates general population rates of trauma at 55% and lifetime prevalence of PTSD at ~8%.

The results of our study show that trauma, abuse, and PTSD may well be elevated, not only in NES patients, but in the intractable seizure population generally. In our study subjects, the prevalence of trauma exposure was >60% higher than overall population rates, with 89% of respondents reporting exposure. Lifetime prevalence of PTSD in our sample (51%) was >600% higher than population prevalence. Both the men and the women had higher trauma rates than those reported for men and women in the general population: 81/61% (males) and 95/51% (females). Whereas only 5% of men and 10% of women in the general population qualified for lifetime PTSD diagnoses according to the NCS (14), 31% of the male and 69% of our female subjects met diagnostic criteria. The PTSD prevalence for women versus men found in our study is similar to the elevated prevalence (twice as high) reported in the national survey. The number of traumatic experiences reported by our subjects also far exceeded the national norms. Although only 10% of the men and 6% of the women in the general population reported lifetime experience of more than four criterion A traumas, both the epilepsy patients and the NES patients reported mean rates of lifetime traumas at or above this level (see Table 1).

It should be noted that our small and relatively homogeneous sample, drawn from patients at a single, tertiary care institution, may limit the generalizability of our findings. The use of retrospective data is also less ideal than longitudinal designs for investigating the contribution of trauma and PTSD to NES symptoms. It should also be noted that this study examined a limited set of hypotheses, and did not fully assess other psychiatric disorders such as dissociation and depression, which have previously been identified in intractable seizure patients. The National Comorbidity Survey (14) found that 88% of men and 78% of women with PTSD met diagnostic criteria for at least one other psychiatric disorder. More comprehensive and large-scale studies using reliable and valid measures for diagnosing both PTSD and other DSM-IV disorders are necessary to clarify further the relative importance of PTSD in characterizing NES and epilepsy patients' psychiatric comorbidities.

The high prevalence of psychological trauma in our study population suggests the importance of identifying trauma victims in both NES and epilepsy patients, and assessing them for psychiatric disorders associated with trauma. There is a considerable range in reported vulnerability to developing posttraumatic symptoms after exposure. Whereas some people can process even extremely disturbing occurrences, such as rape or physical assaults, without lasting negative emotional or somatic effects, others may be extremely sensitive to posttraumatic reactions. There is a similarly wide range in the type and duration of psychiatric symptoms manifest after trauma exposure. Assessment of individuals who are at elevated risk, such as patients with intractable seizures, is important because posttraumatic reactions can have serious impact on illness presentation, quality of life, and physical and emotional well-being. Increased long-term health care costs may be one aspect of such reactivity.

The emergence of PTSD as a clearly defined syndrome, and the availability of therapeutic interventions for this disorder, may offer NES patients an opportunity for effective treatment (29). The results of our study suggest the advisability of routine screening for trauma and PTSD in all patients with intractable seizures. PTSD may affect sleep patterns, level of arousal, treatment adherence, and other factors that impact overall health and illness management. Shen et al. (3) have developed a specific protocol for managing the possible negative reactions to the diagnosis of NES for seizure-disorder patients and for enhancing the probabilities of disclosure of abuse. These procedures have been recommended as enhancing rates of compliance with medications and participation in treatment in patients with past traumas and PTSD.

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