Outcomes of Posttraumatic Stress Disorder

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The typical reaction to a life-threatening experience is one of distress, anxiety, and fear. This is characteristic of the basic survival instinct; these emotions enhance the individual's memory of the traumatic experience and thus serve to help in the recognition and avoidance of similarly dangerous situations in the future. In a significant minority of individuals, however, the natural reaction to trauma becomes uncontrollably and disastrously intensified, resulting in the symptoms of posttraumatic stress disorder (PTSD). PTSD varies in severity and duration between individuals, often relating to personal characteristics and the nature of the trauma to which a person is subjected. However, several factors, namely, chronicity, impairment, comorbidity, and somatization, are significantly related to and can influence the course of PTSD and subsequent outcome. This article briefly reviews each of these factors.
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Most individuals experience at least one traumatic event during their lifetime, and most are able to deal with it and move on. For some, however, exposure to trauma marks the beginning of a period of suffering and distress characterized by the symptoms of posttraumatic stress disorder (PTSD). While this period can be relatively short-lived, for some it can continue unremitted for many months or even years. This review covers several issues pertinent to outcome in PTSD. These can be briefly listed as follows: (1) chronicity—persisting PTSD symptoms, (2) impairment—the detrimental impact of PTSD on daily life, (3) comorbidity—psychiatric disorders and other complications related to PTSD, and (4) somatization—physical complaints associated with trauma exposure and PTSD.

CHRONICITY

A high proportion of persons with PTSD (approximately 82%) meet DSM-IV criteria for chronicity (at least 3 months of PTSD symptoms), and approximately 74% continue to have symptoms for 6 months or more. My colleagues and I[1] have estimated a median time to remission of PTSD of 24.9 months. Data gathered in the National Comorbidity Survey[2] can be plotted as a Kaplan-Meier curve to show a steep decline in symptoms up to approximately 12 months after the event. Thereafter, the curve follows a more gentle downward slope (Figure 1).

Many individuals with PTSD who do receive professional treatment continue to suffer the effects of traumatic events over a period of many years. For example, victims of assault and various man-made disasters have been found to meet criteria for PTSD at least 15 years after the event[3,4] (see Yule review[5] elsewhere in this supplement). Similarly, 50 years later, PTSD is still found in people subjected to the horrors of World War II and the Nazi concentration camps.

Factors Related to Chronic PTSD

Investigation of factors that are possibly associated with an increased risk of chronic compared with nonchronic PTSD has revealed several potentially related characteristics. My colleague and I[6] performed an analysis of data gathered from 394 respondents (of a sample of 1007 young adults) who reported traumatic events. A total of 93 respondents met criteria for PTSD, and of these, 53 suffered chronic PTSD (defined in this study as symptoms persisting for at least 1 year). Compared with individuals with nonchronic PTSD, those with chronic symptoms had a higher total number of PTSD symptoms. They also showed higher rates of numbing and hyperreactivity to stressor stimuli, anxiety or affective disorders, and other coexisting medical conditions. Factors specifically related to chronic PTSD were family history of antisocial behavior and female sex.

More recently, Zlotnick and colleagues[7] identified a history of alcohol abuse and history of childhood trauma as variables associated with a longer time to remittance from an episode of chronic PTSD.

Sex Differences

The higher vulnerability of women than men to PTSD following trauma exposure is well documented[2,8–11] and is

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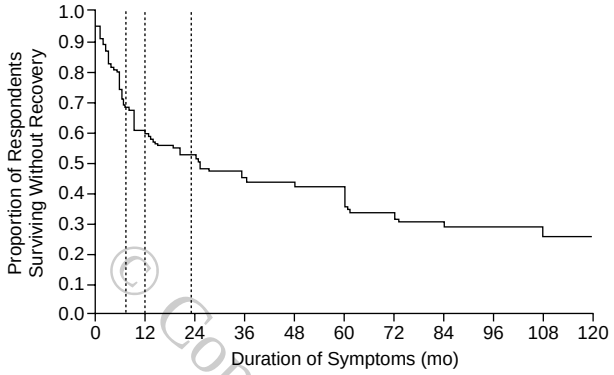
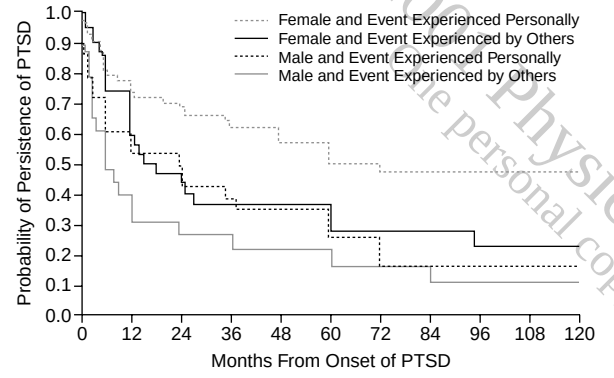
Figure 1. Duration of Posttraumatic Stress Disorder[a]



[a]Reprinted from Breslau et al.,[13] with permission.

Figure 2. Remission of Posttraumatic Stress Disorder (PTSD) by Sex and Trauma Type[a]



[a]Reprinted from Breslau et al.,[13] with permission.

discussed in greater detail in a review of PTSD epidemiology by Breslau[12] elsewhere in this supplement. The duration of PTSD also appears to differ by sex.[2,11] We reported a median duration of DSM-IV PTSD in women approximately 4 times that in men (48.1 months vs. 12.0 months, respectively) and a hazard ratio for remission in women versus men of 0.53.[1] As previously described,[12] this sex difference also exists in relation to the cause of PTSD, or trauma type.[11,13] In women, assaultive violence appears to account for the highest proportion of PTSD cases,[13] while in men there appear to be several main causes, including sudden, unexpected death of a loved one and witnessing violence to others.

Both men and women appear to experience a significantly longer duration of symptoms if the traumatic event is experienced personally (as opposed to traumatic events that others experienced). For example, it has been estimated that for women the median duration of PTSD is 14 months if the event is experienced by others (e.g., sudden, unexpected death of a loved one), but as long as 6 years if the event is experienced personally. Similarly, for men the median duration of PTSD is estimated to be 6 months if the event is experienced by others, but 2 years if it is experienced personally (Figure 2).[1]

Table 1. Factors Related to Impairment in Posttraumatic Stress Disorder: Men Versus Women (%)[a]

Variable	Men (N = 52)	Women (N = 100)
Talked to doctor (or anyone else) about symptoms	28.8	53.3*
Took medication	30.8	43.0
Symptoms substantially interfered in life	65.4	67.0

[a]N.B., unpublished data, January 1999.
*p < .05.

Table 2. Impairment Due to Posttraumatic Stress Disorder Symptoms on Several Parameters of Everyday Life During the 30-Day Period When Most Upset, by Sex (%)[a]

Parameter	Men (N = 52)	Women (N = 100)
Unable to work/attend school	14.0	13.7
Unable to work/reduced activity	19.2	18.9
Spent less time with people	15.6	17.3
Had tensions/disagreements	16.9	16.2

[a]N.B., unpublished data, January 1999. Incidence measured in days.

IMPAIRMENT

Impairment caused by DSM-IV PTSD does not appear to vary between the sexes, despite the fact that women tend to have more contact with their doctors (almost twice as many women than men with PTSD had talked to a doctor about their PTSD symptoms) and take more medication (Table 1) (N.B., unpublished data, January 1999). When subjects were questioned about ability to attend work/school, time spent with others, and frequency of disagreements during the 30-day period when they were most upset owing to PTSD symptoms, results were similar for men and women (Table 2). Interestingly, therefore, men appear to experience as much impairment as women when PTSD criteria are met.

Looking in further detail at the distribution of disability during the month when they were most upset, there was no difference between the sexes. A high proportion of subjects with PTSD (28.8% of men [N = 15] and 26.0% of women [N = 26]) felt they were unable to work during the entire 30-day period. The figures were even higher when reduced activity was combined with disability; 38.5% of men (N = 20) and 43.8% of women (N = 44) were unable to do their job or had to reduce their activities during the 30 days (Table 3) (N.B., unpublished data, January 1999).

In another study, I compared the effects of PTSD, other psychiatric diagnoses (primarily depression and anxiety with no PTSD), and no psychiatric diagnosis on functional impairment in young adults (N.B., unpublished data, Janu-

Table 3. Distribution of Disability Days and Disability/Reduced Activity in Persons With Posttraumatic Stress Disorder (PTSD) During the 30-Day Period When Most Upset Owing to PTSD Symptoms, by Sex (%)[a]

	Subjects With Disability Days		Subjects With Disability Days or Reduced Activity	
Day	Men (N = 52)	Women (N = 100)	Men (N = 52)	Women (N = 100)
0	13.5	17.7	5.8	12.5
1–7	32.7	25.0	17.3	10.4
8–14	9.6	19.8	11.5	14.6
15–29	15.4	11.5	26.9	18.8
30	28.8	26.0	38.5	43.8

[a]N.B., unpublished data, January 1999.

Table 4. Indicators of Functional Impairment in Persons With Posttraumatic Stress Disorder (PTSD), Other Psychiatric Diagnoses, and No Diagnoses (%)[a]

Indicator	PTSD (N = 93)	Other Diagnoses (N = 405)	No Diagnosis (N = 509)
Current limitations in activities	18.3	8.9	4.5
Missed work last month	33.3	23.1	15.5
Self-assessed health as fair/poor	29.0	17.3	6.5
Ever wanted to die	28.0	14.6	2.6
Ever thought about suicide	46.2	29.9	8.7
Ever attempted suicide	17.2	7.4	1.2

[a]N.B., unpublished data, January 1995. All comparisons significant at $p < .0001$.

ary 1995). When compared with other conditions and individuals with no diagnosis, the impact of PTSD on functional impairment was striking (Table 4). All indicators of functional impairment occurred with a significantly greater rate in the PTSD group than in those with other diagnoses. Similarly, both the PTSD and the other diagnoses groups exhibited significantly more functional impairment according to all indicators assessed than the group without a diagnosis.

In a recent analysis of data from the National Vietnam Veterans Readjustment Study,[14] Zatzick and colleagues[15] examined several outcomes to assess the effects of PTSD on functioning and quality of life. Subjects with PTSD were at significantly higher risk of poorer outcome than those without PTSD for most of the domains studied, including "physical limitations," "currently not working," "compromised physical health status," and "diminished well-being," even when the effects of comorbid psychiatric and other medical conditions were accounted for. The authors concluded that individuals with PTSD suffer not only from the wide range of disabling symptoms that define this disorder, but also from significant functional and social morbidity.

COMORBIDITY

As previously discussed (see reviews by Shalev[16] and Yule[5] elsewhere in this supplement), PTSD is associated with high lifetime comorbidity with other psychiatric disorders. To further examine the psychiatric sequelae of PTSD, my colleagues and I conducted a study[17] in a sample of 801 mothers (mean age = 33.1 years). The lifetime prevalence of PTSD in the total sample was 13.8%. Major depression, alcohol abuse/dependence, and drug abuse/dependence were all found to occur with a significantly higher rate in those with PTSD than those without (hazard ratios of 2.1, 3.0, and 2.3, respectively). Major depression was the single most prevalent comorbid disorder, occurring in 43.2% of women with PTSD. Lifetime comorbidity of PTSD with the psychiatric disorders analyzed was 73%.

Table 5. Incidence of Comorbidity 3.5 Years After Trauma Exposure in Individuals With and Without Posttraumatic Stress Disorder (PTSD) and in Unexposed Individuals (%)[a]

Condition	Exposed, PTSD	Exposed, No PTSD	Unexposed
Major depression	21.0	6.3	5.0
Any anxiety	15.8	9.8	7.1
Alcohol abuse/dependence	3.2	6.3	5.0
Drug abuse/dependence	2.8	0.8	1.5

[a]Data from Breslau et al.[19]

This study also investigated whether preexisting psychiatric disorders could increase the risk for PTSD by increasing both the likelihood of trauma exposure and the subsequent vulnerability to the disorder. It has previously been suggested that the functional disabilities that accompany mental illnesses could put individuals at greater risk of exposure to traumatic experiences.[18] Women who had preexisting major depression, any anxiety, or illicit drug abuse/dependence were at increased risk of first exposure to traumatic events. Furthermore, the risk of PTSD was increased in exposed women who had prior major depression, independent of any relationship with other disorders.

It is well documented that there are associations between PTSD, major depression, and other anxiety disorders. The cumulative incidences of major depression and any anxiety, as well as alcohol abuse/dependence and drug abuse/dependence, at 3.5 years after the trauma exposure are shown in Table 5 in persons with PTSD, exposed to trauma without PTSD, and with no prior trauma exposure.

Interestingly, the onset of new comorbid disorder after exposure appears to be concentrated in those with PTSD and not in those who are exposed to trauma but do not develop PTSD. Only alcohol abuse/dependence occurred with a lower incidence in those with PTSD than in the exposure-only and no exposure groups.

Depression is a secondary disorder to or is comorbid with many other conditions. However, the relationship that exists between anxiety and depression appears to be uniquely strong.[20] The relationship is not specific to PTSD but occurs with all anxiety disorders (e.g., panic disorder, generalized anxiety disorder, and phobias). Although women have a higher rate of anxiety than men, men with

anxiety appear to be just as likely to develop subsequent depression as women.

PTSD and Drug Abuse/Dependence

Although it is well acknowledged that PTSD is highly comorbid with drug abuse or dependence,[2,8,17] relatively little is known about the causal pathways that might explain the observed comorbidity. In a study of 1007 young adults (21–30 years of age), we compared the risk for drug abuse or dependence (for both prescribed and any drugs) in individuals who had been exposed to trauma but did not have PTSD and individuals with PTSD.[21] Although no increase in risk was observed in the exposure-only group, there was a markedly increased risk in those with PTSD; the risk for abuse or dependence was highest for prescribed psychoactive drugs, with a hazard ratio of 13.0 (compared with 1.8 in the exposure-only group). The risk for any drug abuse or disorder was 4.5 in the PTSD group and 1.3 in the exposure-only group.

These findings are consistent with other studies demonstrating that preexisting PTSD, but not trauma exposure in the absence of PTSD, increases the risk of drug abuse/dependence.[2,17,22] This study also found, however, that the relationship between drug abuse/dependence and PTSD was significant only for prescribed psychoactive drugs and not for drugs such as cocaine and marijuana.[21]

We proposed 3 possible causal pathways between PTSD and drug use disorders[23]: (1) self-medication of PTSD symptoms, (2) high risk of exposure to traumatic events among drug abusers, and (3) drug abusers' increased susceptibility to PTSD following trauma exposure. A fourth hypothesis—that an indirect pathway links PTSD and drug use disorders through a shared vulnerability—was also considered.[23] Evidence for each causal hypothesis was evaluated according to Hill's criteria for causal interference. There was little support for the latter shared vulnerability theory, and there was no evidence of an association between trauma exposure without PTSD and drug abuse/dependence. We suggested that it is PTSD rather than the traumatic experience that is most strongly related to drug use disorders. In this respect, the most plausible hypothesis was that of self-medication: that drug abuse or dependence in individuals with PTSD is the result of efforts to reduce symptoms.

SOMATIZATION

In addition to a high risk of comorbidity and functional impairment, PTSD is typically associated with an increased risk of various other chronic problems, including numerous physical complaints. The coexistence of somatization symptoms with PTSD may have a significant impact on functional disability and the overall course of the disorder. According to the DSM-III-R,[24] a diagnosis of somatization disorder requires the persistence of 13 symptoms from a possible 35. The symptoms are divided into 6 categories: (1) 6 gastrointestinal symptoms, (2) 5 pain symptoms, (3) 4 cardiopulmonary symptoms, (4) 12 conversion or pseudoneurologic symptoms, (5) 4 sexual symptoms, and (6) 4 female reproductive symptoms. Although epidemiologic studies[25–27] indicate that the rate of somatization disorder is virtually zero (reports range from 0.05%–0.38%), my colleagues and I have observed a relationship between PTSD and a less restrictive definition of "abridged" somatization.[28] This is defined as at least 4 somatization symptoms in men and at least 6 such symptoms in women.[29] Using lifetime data from our study of young adults,[28] it was shown that individuals with PTSD experienced more than 3 times as many symptoms associated with somatization disorder than those without PTSD (24.7% vs. 8.2%, respectively). A sex difference was also observed; women with PTSD tended to have almost twice as many symptoms as men with PTSD (for all symptom groups studied except pain and cardiopulmonary).

When compared with individuals with no psychiatric disorders, those with PTSD experienced an average excess of 2.1 somatization symptoms, compared with an average excess of 0.9 in individuals with other psychiatric disorders. This increased incidence of symptoms was found in all symptom groups except pain. A prospective analysis of data gathered from 5 years of follow-up revealed an increased likelihood of first onset of conversion symptoms and pain symptoms in those with a history of PTSD.[28]

These data are consistent with previous research indicating that individuals with PTSD experience more somatization symptoms than those without.[30,31] For example, Shalev et al.[30] reported increased rates of cardiopulmonary symptoms, audiologic symptoms, headache, and back pain among combat veterans with PTSD compared with a control group without PTSD. Similarly, McFarlane and colleagues' study of firefighters[31] showed that cardiovascular, respiratory, musculoskeletal, and neurologic symptoms were experienced more frequently by those with PTSD than those without.

SUMMARY

This article has briefly reviewed several factors that can significantly influence the course and impact of PTSD. Studies indicate that the effects of PTSD vary widely from one individual to another, not only in terms of the duration of symptoms, but also in the level of functional and social impairment, comorbidity, and somatization experienced. It is essential that clinicians be aware of the influence that these factors can have on their patients. Nevertheless, current understanding of the mechanisms underlying these effects and the observed interindividual variations in PTSD is lacking. Further research is essential to delineate the factors that play a role in influencing the course and outcome of PTSD and subsequently improve patient management.

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