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## PTSD In Children & Adolescents

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By Terence T. Gorski

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1. **Developmental History of the Concept of PTSD:** Post Traumatic Stress Disorder (PTSD) is a prolonged, pathologic anxiety that may occur following a severe trauma in both adults and adolescents. This concept has developed over hundreds of years of experience and experimentation.
  - A. PTSD symptoms have been recognized for centuries as an extreme reaction to trauma.
  - B. In 1980 PTSD was officially recognized as a mental disorder when it was included in the third edition of the *Diagnostic and Statistical Manual* (DSM-III) by the American Psychiatric Association.
  - C. PTSD symptoms are long in duration, subjectively painful, functionally impairing, and are often associated with alcohol/drug abuse and diminished impulse control.

2. **Risk & Protective Factors Related To PTSD:** The prevalence of PTSD is determined by the presence or absence of the following risk and protective factors:
  - A. The frequency of trauma in a population.
  - B. The characteristics of the trauma experienced including its frequency (single vs. multiple events), severity and duration of each event, and ongoing risk of recurrence.
  - C. The preparation of the population for coping with traumatic events by understanding the nature of traumatic and post traumatic stress, techniques for coping during the trauma, and techniques for recovering after the trauma, indicators that professional help is required, and how to access treatment resources.
  - D. Individual characteristics including the level of personal resiliency, previously learned coping skills, and previous successful experiences in coping with other similar traumatic experiences, and the presence or absence of addiction or mental health problems prior to the trauma.
  - E. The nature of support following the trauma. Safe and supportive environments that encourage talking about the trauma in an accepting and non-judgmental atmosphere, and encourage a personal process of recovery lower the incidence and severity of PTSD. Nonsupportive environments that deny the trauma, minimize its severity, criticize or judge the victim for having symptoms, and fail to encourage a personal recovery process increase the incidence and severity of PTSD.
3. **Prevalence of PTSD:** The following studies have been done on the prevalence of PTSD. The variances in prevalence can be accounted for by differences in the risk and protective factors within the populations studies.
  - A. **Epidemiologic Catchment Area (ECA) Studies - 1987:** The lifetime prevalence of PTSD was approximately 1% in the population as a whole, with a prevalence 0.8% among males and of 1.2% among females.<sup>[1]</sup>
  - B. **National Vietnam Veterans Readjustment Study (NVVRS) - 1990:** The lifetime prevalence of PTSD was 15% among combat troops and the symptoms were found to be long-term and create significant physical, psychological and social problems. <sup>[3]</sup>
  - C. **The National Comorbidity Study - 1995:** The lifetime prevalence

of PTSD in persons aged 15-54 was 7.8%.<sup>[4]</sup>

D. **The Giaconia Longitudinal Study of PTSD - 1995:** Reported that 6.3% of adolescents met the full criteria for PTSD of the Diagnostic Interview Schedule (DIS). This was based upon the longitudinal study of 384 normal adolescents beginning when they were 5 years old.<sup>[6]</sup> Non of the study group had been referred for addiction or mental health services.

E. **The Cuffe Longitudinal Study of PTSD - 1998:** Reported that the lifetime occurrence of PTSD was 3.5% overall, with approximately 3% of females and 1% of males meeting DSM-IV diagnostic criteria.<sup>[7]</sup> and coworkers in a population of 490 South Carolina adolescents enrolled in a longitudinal study of depression and suicidal behaviors.

4. **Trends In PTSD Incidence and Prevalence:** The incidence rate and lifetime prevalence of PTSD among adolescents appears to be rising.

A. One of the factors in the increase is the growing exposure of children and adolescence to violence that increases the risk of traumatization.

B. The September 11, 2001 terrorist attacks and the ongoing threat of new attacks that may include biological, biochemical, and nuclear weapons will probably further increase the incidence rates of PTSD. The increase in substance abuse, mental health, and family problems will probably increase the overall level of family and community violence further increasing the incidence rates in adolescents.

5. **Consequences of PTSD In Adolescence & Childhood:** In 1996 The Task Force on Adolescent Assault Victim Needs reported that the onset of PTSD in adolescence can cause life-long impairment because it can interfere with normal adolescent development and prevent children from acquiring the basic life skills needed to become independent and self-sufficient adults. .<sup>[5]</sup>

A. Middle adolescence is an age at which major structural change occurs in the brain.<sup>[29]</sup> Trauma during this period of rapid brain development may arrest neurological development or produce a regression to an earlier stage of neural structure.

B. The most serious consequence of PTSD during adolescence is its association with the heavy use of alcohol and/or other drugs. Substance abuse has immediate consequences in the form of increased accidents, injuries, and long-term effects in terms of

occupational and familial instability and early mortality. Furthermore, substance abuse, in itself, is often a risk factor for additional traumatic exposures either through accidents or interpersonal violence.

8. **Reducing The incidence of PTSD:** Reduction of PTSD could be achieved through a combination of the following:
  - A. Prevention programs for children and families that teach skills related to resiliency, problem solving, and coping with trauma.
  - B. Taking measures that reduce exposure to traumatic incidents by more effectively addressing issues of family violence, school violence, media violence, and media exposure to episodes of traumatic violence.
  - C. Initiating early identification and intervention for PTSD, substance abuse and related mental health problems. This would involve training emergency medical professionals, law enforcement, and court professionals to recognize the warning signs of PTSD in relation to violent episodes and refer to appropriate community resources for education, assessment and treatment.

## **Posttraumatic Stress Disorder In Childhood and Adolescence: A Review**

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### **Abstract**

PTSD occurs at a high rate in children and adolescents, and this rate appears to be rising. Because this syndrome can have long-lasting effects when it occurs before adulthood, early recognition and treatment are vital.

### **Introduction**

Posttraumatic stress disorder (PTSD) is a prolonged, pathologic anxiety that

may occur following a severe trauma in both adults and adolescents.

According to the current definition in the fourth edition of the American Psychiatric Association's *Diagnostic and Statistical Manual* (DSM-IV), PTSD occurs subsequent to a trauma that constitutes a threat to life or physical integrity and elicits intense fear, horror, or helplessness. In order to meet full criteria for PTSD, the individual must subsequently have the feeling of re-experiencing the trauma and have symptoms of avoidance, numbing, and hyperarousal. The symptom cluster must have been present for a least a month following the traumatic event.

Although such symptoms have been recognized for centuries as an extreme reaction to trauma, it was only with the 1980 publication of the third edition of the *Diagnostic and Statistical Manual* (DSM-III) that PTSD was designated as a psychiatric disorder in the psychiatric nomenclature. The inclusion of this disorder as an official psychiatric classification was prompted, in part, by the large number of Vietnam veterans who were suffering from a predictable symptom cluster following combat experience. These symptoms were of long duration, subjectively painful, functionally impairing, and were often associated with alcohol/drug abuse as well as with diminished impulse control.

### Prevalence of PTSD Among Adults

The establishment of clear diagnostic criteria for PTSD made possible for the first time the assessment of its prevalence. In the early 1980s, the National Institute of Mental Health launched the *Epidemiologic Catchment Area (ECA) studies*, which were designed to quantify the lifetime and current prevalence of discrete psychiatric disorders among adults in five large US communities. PTSD was among the disorders assessed. The data from these surveys indicated that the lifetime prevalence of PTSD was approximately 1% in the population as a whole, with a prevalence 0.8% among males and of 1.2% among females.<sup>[1]</sup>

The ECA surveys were soon followed by *The National Vietnam Veterans Readjustment Study (NVVRS)*, consisting of in-depth investigations on the occurrence, risk factors, correlates, and outcome of PTSD among Vietnam veterans.<sup>[2]</sup> Results from this comprehensive study showed that the lifetime prevalence of PTSD was 15% among combat troops. The information from the NVVRS clearly documented both the high frequency of PTSD among Vietnam veterans as well as the deleterious mental, physical, and social consequences of PTSD.<sup>[3]</sup> More recently, *The National Comorbidity Study*, based on a representative national sample of 5877 persons aged 15-54, reported the lifetime prevalence of PTSD to be 7.8%.<sup>[4]</sup>

### Prevalence of PTSD Among Adolescents

The onset of PTSD in adolescence, a pivotal phase of human development, has a particularly damaging impact, since it may impair the acquisition of life skills needed for independence and self-sufficiency. Mastery of these skills occurs within a limited time and must be accomplished in order to meet the demands of the adult world. If these skills are not achieved before the onset of adulthood, the impairment can be lifelong. **The Task Force on Adolescent Assault Victim Needs** has stressed the importance of recognition and treatment of the adolescent victim of violence for these very reasons.<sup>[5]</sup> The Task Force stated, "The major tasks of adolescence are separation and emancipation, development of identity, mastery of tasks and development of vocational interests. In late adolescence, assaults and violence can disrupt the consolidation of skills developed in early adolescence with disastrous consequences."

The findings of the ECA and of the NVVRS prompted further study of PTSD not only among adults but also in groups of youths and adolescents. Much of what is currently known of the risk factors and consequences of PTSD among adolescents comes from research on clinical samples, or on groups of youths who have experienced a shared trauma such as a natural disaster, war experience, or other life-threatening events. However, there are now three prevalence studies that document the frequency of PTSD in nonclinical adolescent populations.

In the first of these, **Giaconia and colleagues** assessed the prevalence of PTSD in a nonreferred Massachusetts community sample of 384 adolescents (mean age, 17.9 years) who were participating in an ongoing longitudinal study that began when the subjects were 5 years old.<sup>[6]</sup> Lifetime prevalence of PTSD was determined by the Diagnostic Interview Schedule, the same instrument of data collection used in the adult ECA studies. The investigators found that 6.3% of the adolescents met full criteria for a lifetime diagnosis of PTSD.

A second prevalence study, undertaken by **Cuffe and coworkers** in a population of 490 South Carolina adolescents enrolled in a longitudinal study of depression and suicidal behaviors, reported that the lifetime occurrence of PTSD was 3.5% overall, with approximately 3% of females and 1% of males meeting DSM-IV diagnostic criteria.<sup>[7]</sup> Last, a soon-to-be-published telephone survey based on a national sample of 4023 adolescents aged 12-17 indicates that the lifetime prevalence is 8.1%.<sup>[8]</sup>

Despite some variation in the estimates among these three studies, it is apparent that **the lifetime prevalence of PTSD among adolescents today greatly exceeds that found by ECA studies of adults in the 1980s**. The occurrence of PTSD in these young populations probably reflects the well-documented increase of interpersonal violence in recent years.<sup>[9]</sup>

Differences in the prevalence of PTSD in the three surveyed populations are largely due to variations in the frequency of trauma exposure. The South Carolina sample had about half the prevalence of PTSD of the Massachusetts adolescents (3.5% vs 6.3%), but this observed difference disappears when the risk of developing PTSD is compared among those who experienced trauma. In the Massachusetts sample, 43% had experienced a qualifying trauma and 14.5% of the traumatized adolescents developed PTSD; in comparison, only 16.3% of the South Carolina adolescents had experienced a qualifying trauma, but 21.3% of those suffered subsequent PTSD. Since, by definition, PTSD cannot occur among persons who have not experienced a trauma, **the level or frequency of trauma in a population is the prime determinant of the prevalence of PTSD.** However, not all persons who have suffered a qualifying trauma go on to develop the disorder. Current evidence strongly suggests that **a number of other factors in addition to trauma experience influence the probability of developing PTSD. Among these are the characteristics of the trauma, characteristics of the individual and the environment, and the nature of support following the trauma.** These variables play an important role in either enhancing or diminishing the risk of PTSD. This article will critically examine what is known of the risk factors for adolescent PTSD, its consequences, and the current treatment strategies.

## **Risk Factors and Correlates of PTSD Among Adolescents**

### **Nature of the Traumatic Experience**

Considerable evidence indicates that the probability of developing PTSD varies with the nature of the experienced trauma, with interpersonal violence being a strong causative factor. Giaconia and associates<sup>[6]</sup> reported that in their community survey, rape was the event most likely to lead to PTSD. Similarly, Deykin and colleagues found that in a sample of 297 adolescents receiving treatment for dependence on alcohol or other drugs, rape was the trauma most likely to cause PTSD.<sup>[10]</sup> Although rape was far more common among the female subjects (40%), the few males who experienced rape (3.6%) had an almost identical risk of PTSD (76.7% vs 75.0%).

Apart from rape, other forms of assault, even if only witnessed, impart a high risk of subsequent PTSD. Kilpatrick and associates reported that children who had witnessed domestic violence, but were not victims themselves, had significantly higher scores on a PTSD screening instrument than children who had not witnessed such violence.<sup>[11]</sup> The researchers suggest that the marked difference in the two groups may in part be due to the fact that the aggressor was frequently the father, thus creating an irresolvable conflict of loyalty.

Last, the effects of interpersonal violence are not limited to the victims; they may have a deleterious impact on the perpetrators as well. Steiner and coworkers studied a group of incarcerated juvenile delinquents and found

that 31.7% met criteria for current PTSD, and that for 5% of the sample, the symptoms of PTSD resulted from violence they perpetrated on others.<sup>[12]</sup>

While current data all point to high rates of PTSD following interpersonal violence, the disorder can also occur following natural disasters, including earthquakes, hurricanes, and accidents, as well as war. Research on the consequences of natural disasters and accidents suggests that in the initial phase, there can be considerable trauma-related symptoms, but the effects tend to diminish faster than in the case of interpersonal violence. Green and associates followed a cohort of children who had experienced the burst of the Buffalo Creek dam 17 years previously, which resulted in extraordinary property loss as well as some loss of life.<sup>[13]</sup> At the initial evaluation, the prevalence of PTSD attributable to the flood was 32%; at follow-up, it had decreased to 7%. In contrast, PTSD due to trauma unrelated to the flood decreased only from 6% to 4%.

In a study of school-aged children who had experienced Hurricane Hugo in 1989, Shannon and colleagues found that among the 5687 children and adolescents aged 9-16 who had lived through the hurricane, more than 5% had symptoms sufficiently severe to be classified as PTSD.<sup>[14]</sup> The investigators stated that younger children and females of any age reported more symptoms. In contrast to males, whose symptoms appeared to be manifest in deficits of memory and concentration, females tended to display symptoms involving repetitive thoughts of the hurricane, and emotional avoidance and numbing. As might be expected, youth who were able to remain in familial settings were less vulnerable to PTSD, even despite property damage. The importance of familial supports in mitigating the effects of natural disasters, accidents, and even war has been reported by other investigators as well.

Subjects who were directly affected by natural disasters had the highest risk of PTSD. In a follow-up investigation of the 5687 subjects who had experienced Hurricane Hugo, Lonigan and colleagues reported that the degree of PTSD symptoms was directly related to the level of the hurricane's impact on the subjects.<sup>[15]</sup> Subjects whose houses were damaged, became displaced, or whose parents lost employment as a result of the hurricane were twice as likely to meet criteria for PTSD as subjects who did not experience such events. However, the investigators found that what appeared to be the most important predictive factor was the level of a subject's trait anxiety and reported emotional reactivity during the storm, suggesting that the intrinsic emotional makeup of the youth studied played an important role in the development of PTSD. Severity of exposure was most strongly associated with PTSD symptoms of intrusive memories of the hurricane, and only weakly associated with the symptom clusters of numbing/avoidance and hyperarousal.

Similar findings were reported in a study of the consequences of an industrial

fire in North Carolina.<sup>[16]</sup> The investigators assessed 1019 children/adolescents and classified them according to the level of their exposure to the fire. Those who had both lost a loved one and personally witnessed the fire were classified as most exposed subjects. The other exposure groups were: those who had lost a relative; those who only witnessed the fire; and those who had neither witnessed the fire nor had a relative perish. Overall, nearly 12% of the study sample met full criteria for PTSD, with another 9.7% displaying subclinical symptoms. However, the percent of both clinical and subclinical PTSD diminished with each lower level of trauma experience. Additional documentation pointing to **a link between the proximity of the trauma and the development of PTSD** was reported by Pynoos and associates, who studied children exposed to a sniper attack at their school. Children who had been most exposed to the threat of attack had the greatest amount of symptoms.<sup>[17]</sup>

In the case of war, however, not all studies have found a link between the level of trauma and manifest symptoms. Ziv and Israeli studied the anxiety level of 103 Israeli children who were residents of kibbutzim that frequently received enemy shelling, and compared it with that of 90 children who lived in kibbutzim that had never been shelled.<sup>[18]</sup> Contrary to their stated hypotheses, the findings did not support the theory that children with exposure to shelling had a higher level of anxiety. In fact, these findings tend to confirm **the role of family support**, as cited above. The researchers suggest that this might be the result of **adaptation to the recurring stressor which, over time, facilitated the development of adaptive defenses**. In addition, the children experienced the shelling not as individuals, but as members of a cohesive group that provided closeness, affiliation, and mutual support. These findings contrast with those of Hubbard and colleagues, who assessed PTSD in a sample of 59 Cambodian adolescent and young adult refugees who had survived massive childhood trauma.<sup>[19]</sup> They found that 24% met diagnostic criteria for current PTSD and 59% for lifetime prevalence. High rates of major depression and social phobia were found to accompany PTSD. Subjects with current PTSD had the highest number of comorbid conditions, and those with no PTSD had the lowest.

### **Number of Traumas and the Risk of PTSD**

In addition to the nature of the traumatic event, another important predictor is the total number of previous traumas the individual experienced. There is evidence suggesting that persons with a high number of past traumas, even though they did not lead to PTSD, have a higher risk of developing PTSD than persons with few or no lifetime traumas. Studies of veterans have shown that soldiers with a history of childhood physical or sexual abuse were more likely to develop PTSD than those without such a history, even though both groups had sustained combat trauma of equal severity. Persons who have had a series of low-risk traumas without consequence appear to be more vulnerable to developing PTSD after another low-risk trauma. The data

seem to indicate a threshold effect that is reached either by a single high-risk trauma such as rape or by a series of low-risk traumas.

The cumulative effect of many traumas was noted by Deykin and coworkers<sup>[10]</sup> among male subjects but not among females. In their sample of chemically dependent adolescents, the risk of PTSD increased from 27% for males who had only one previous trauma to 30.6% for those with two previous traumas, and to 62.5% for those with three previous traumas. The risk of PTSD in relation to the number of previous traumas may not have been present among females, because most had developed PTSD subsequent to rape, the trauma most likely to produce PTSD even in the absence of any other previous trauma.

Duncan and associates surveyed a national sample of 4008 women to determine the prevalence of childhood physical assault, major depression, PTSD, and substance abuse.<sup>[20]</sup> The researchers found that among the 2.6% who had experienced childhood physical assault, there was a significantly higher prevalence of PTSD, depression, and substance abuse, with the highest risk conferred on PTSD and depression. These studies underscore the importance of the total burden of traumatic episodes and are consistent with the work of Terr, who proposed that there are two types of trauma leading to PTSD symptoms.<sup>[21]</sup> Type I is characterized by exposure to a sudden, one-time event, whereas type II results from repeated events which foster coping mechanisms of denial and dissociation. It is possible that in the event of an additional trauma these defenses are overwhelmed and lead to clinically observable PTSD.

### **PTSD and Psychiatric Comorbidity**

All empirical studies that have assessed PTSD and psychiatric comorbidities have noted that PTSD occurs more frequently among persons who have other psychiatric disorders. In a study of young adults enrolled in a health maintenance organization, Breslau and coworkers reported that the presence of coexisting psychiatric disorders specifically elevated the probability of developing PTSD following trauma but not the probability of experiencing a trauma.<sup>[22]</sup> The same finding has been reported by Giaconia and colleagues.<sup>[6]</sup> Deykin and associates<sup>[10]</sup> found, in their sample of chemically dependent adolescents, that subjects without any trauma history had the lowest occurrence of psychiatric disorders; those with trauma experience but no PTSD had a slightly higher occurrence of psychiatric disorders, but those with trauma and PTSD were between 7 and 13 times as likely to have other psychiatric classifications. Major depressive disorder was the most common psychiatric comorbid condition. In this study it was impossible to assess the association of PTSD with alcohol or drug abuse, since all subjects were chemically dependent. Almost identical findings were reported by Warshaw and associates, who found in their study of 688 adults

with anxiety disorders that major depression was present in 53% of subjects without trauma, in 58% of those with a trauma history but no PTSD, and in 76% of those who had developed PTSD following a trauma.<sup>[23]</sup> The rates for alcohol abuse or dependence were 21%, 24%, and 38%, respectively.

Since most research studies have been cross-sectional in nature, it has been difficult to determine whether PTSD enhances the risk of depression and/or substance abuse or whether the presence these comorbid conditions increases vulnerability to PTSD. Deykin and associates<sup>[10]</sup> attempted to untangle the temporal sequence of chemical dependence and PTSD by comparing the age of the first episode of PTSD with the age at which a subject first met full criteria for chemical dependence. They found that in the whole sample, there was no clear pattern -- the onset of PTSD was intertwined with the onset of substance dependence. However, when the relationship was examined separately by gender, they found that PTSD tended to precede the onset of chemical dependence among females, whereas the reverse was true for males. The researchers proposed that females use alcohol and other drugs as a way of deadening the psychic discomfort of PTSD. Among males, substance dependence appeared to be the primary disorder, leading to behaviors and interactions that enhance trauma occurrence.

Two investigations have focused on the possible association of cognitive impairment and PTSD. McNally and Shin found that in their sample of 105 Vietnam combat veterans, intelligence, as measured by full-scale WAIS-R test, accounted for 3% of the variability in the severity of PTSD symptoms, even when the degree of combat experience was controlled for.<sup>[24]</sup> The investigators concluded that low intelligence may be a risk factor for severe PTSD. While the results of this study are intriguing and explore a previously unexamined area, one should be cautious in drawing conclusions from this cross-sectional study, as the results could equally support a hypothesis that severe PTSD impairs functional intelligence. A second study by Vasterling and coworkers examined attention and memory dysfunction in a group of Persian Gulf veterans who were diagnosed with PTSD but were free of neurologic damage, systemic illness, and alcohol/drug-related disorders.<sup>[25]</sup> Veterans with PTSD performed less well on measures of attention, learning, and memory than veterans without PTSD. However, similar to the McNally study, this study also was cross-sectional in design, and although it documented intellectual deficits among subjects with PTSD, it shows only an association rather than a directional cause and effect.

The relationship of PTSD and intelligence has not been studied in children and adolescence. To fully understand the connection of intelligence with PTSD would necessitate a carefully constructed research design in which measures of intelligence are available both before and after traumatic exposures and confounding variables are assessed and controlled.

### **Age, Gender, and Race**

There are only sparse data that assess the differential effects of age on the development of PTSD, possibly because individual studies focus on narrow age ranges, making it difficult to compare outcomes for younger and older children. However, Lonigan and associates<sup>[15]</sup> found that in their study of children who experienced Hurricane Hugo, younger children were more likely to develop PTSD; the researchers cautioned, however, that this finding might have been due to the higher levels of trait anxiety found in the younger subjects. Among younger children, pathological responses to trauma have been found to mirror parental responses. Earls and coworkers found that in a study of the reactions of children to severe flooding in rural Missouri, the children who were most adversely affected were those who had pre-existing disorders and those whose parents reported a high number of symptoms for themselves.<sup>[26]</sup> The study by Hubbard and colleagues<sup>[19]</sup> that examined the occurrence of PTSD among the Cambodian survivors of the Pol Pot atrocities found that trauma exposure was related to age, but that age, in itself, did not predict symptoms.

In contrast to the generally negative findings concerning age, gender was a strong predictor of PTSD. All studies that have investigated gender as a risk factor have found that females are more likely than males to develop PTSD, even when one considers trauma apart from rape.

As in the case of age, there are very few data comparing the effects of trauma in different racial groups. The study by Shannon<sup>[14]</sup> noted some differences in the types of symptoms experienced by white, African-American, and other minority children in the aftermath of Hurricane Hugo, but the differences were mainly due to level of exposure, reporting biases, and possibly to a differential risk of PTSD outcome. The most recent national survey by Kilpatrick<sup>[8]</sup> found that race was unrelated to the risk of PTSD when exposure severity was controlled. It appears, therefore, that if race is a risk factor for PTSD, it is only so because it is a marker of traumatic exposures.

### **Consequences of Posttraumatic Stress Disorder**

As was noted earlier, the onset of PTSD during adolescent development could have serious negative implications for the mastery of life skills. Data suggest that the symptoms of PTSD can diminish adolescents' perception of self-efficacy as well as their academic performance. Studying three groups of adolescents, Saigh and coworkers found that traumatized adolescents who developed PTSD had lower scores on various measures of perceived self-efficacy, compared either with adolescents who had experienced serious trauma but did not develop PTSD, or with normal comparison subjects.<sup>[27]</sup> The same findings were noted in a subsequent study which examined the academic performance of three groups of Lebanese teenagers. The group

who developed PTSD had appreciably lower scores on the Metropolitan Achievement Test than either the traumatized adolescents without PTSD or those without trauma.<sup>[28]</sup> A lowered sense of self-efficacy and a diminished academic achievement co-occurring with peer competition for educational/occupational opportunities could have long-standing damaging effects. In addition, the PTSD symptoms of avoidance and numbing may interfere with social relationships and thus impair the ability to forge meaningful interpersonal ties.

In reviewing what is currently known of the neurobiologic response to trauma, Pynoos and associates have stated that midadolescence is an age at which major structural change occurs in the brain.<sup>[29]</sup> They suggest that trauma during this period of rapid brain development may arrest development or produce a regression to an earlier stage of neural structure. These investigators examined 37 adolescents five years after the Armenian earthquake, and found that those with the most severe PTSD had a rapid decline of 3 methoxy-4-hydroxyphenylglycol levels and a greater suppression of cortisol than age-comparable adolescents who had not experienced the earthquake. Yet, it should be noted that only a few studies have examined the intellectual and developmental status of adolescents with PTSD, and that these studies have been based on small samples. Until additional data are available, the precise mechanism of how such deficits occur remains speculative. There is no question, however, that **the most serious consequence of PTSD during adolescence is its association with the heavy use of alcohol and/or other drugs. Substance abuse has immediate consequences in the form of increased accidents, injuries, and long-term effects in terms of occupational and familial instability and early mortality. Furthermore, substance abuse, in itself, is often a risk factor for additional traumatic exposures either through accidents or interpersonal violence.**

### **Treatment of PTSD**

Treatments for PTSD span individual therapy, group therapy, family therapy, anxiety management, desensitization, and relaxation techniques. However, most treatments for children and adolescents have been primarily of a psychotherapeutic nature, helping the individual to gain mastery over the trauma. Innovative therapies developed primarily for veterans have not been widely used in adolescent samples. Goenjian and coworkers employed brief trauma/grief psychotherapy with young adolescents a year and a half after the Armenian earthquake of 1988, and reported a significant diminution of PTSD symptoms but not depressive symptoms among the treated subjects.

<sup>[30]</sup> Some pharmacotherapy, especially drugs that diminish anxiety, has been found to be helpful in conjunction with psychotherapy. Flooding, a technique which involves prolonged imaginal exposures to highly adverse stimuli, was used with some success on two adolescents who had war-related trauma, but has been used largely for combat veterans.<sup>[31]</sup>

## Summary and Discussion

Recent epidemiologic data suggest that in the past 15 years there has been an increase in the lifetime prevalence of PTSD for the population overall, with unusually high rates among adolescents and young adults. A precipitous increase of a disorder over a short period of time raises the question of whether the increase is real or due to spurious factors such as better diagnostic measures or changes in the defining criteria. In the case of PTSD, both factors seem to be operating.

In all likelihood, there has been an actual increase in the lifetime occurrence of PTSD resulting from the well-documented rise in the rate of interpersonal violence, especially among adolescents. Interpersonal assaults in adolescence are more common now because of rises in drug dealing, widespread firearm ownership, and a general disinhibition towards employing violence as a means of settling even minor disputes. As interpersonal violence often constitutes a threat to life or physical integrity -- a criterion for meeting the definition of a qualifying trauma -- it is not surprising that the rate of PTSD among adolescents, and to a lesser extent, among adults as well, has risen. Concurrent with more frequent exposures to violence, there has also been a secular increase in the incidence of major depressive disorder in adolescence. While it is not clear whether a major depression predisposes one to developing PTSD or whether PTSD lowers resistance to depressive illness, depression and PTSD are frequently found to occur together. If depressive illness lowers one's ability to withstand the long-term effects of severe trauma, then the increase of PTSD may mirror the increase of depressive illness in adolescence.

Second, the increased prevalence of PTSD can also result from a greater willingness to report symptoms of PTSD. This is particularly relevant for victims of rape who are more likely now than previously to divulge sexual assaults, since the fear of recriminations and shame is less than it used to be. If this is a major contributor to recent epidemiologic findings, then one would expect to find that females are at higher risk of being diagnosed with PTSD. In fact, this seems to be the case. Although even early community-wide surveys have reported a slightly higher prevalence of PTSD among females than among males, the gender differential has increased in more recent studies.

Last, one should be aware of changes in the criteria for a diagnosis of PTSD and in methods of data collection which might produce higher estimates of prevalence. For example, the National Comorbidity Study in 1995 reported a prevalence of 7.8%, or about seven times that found by the ECA study a decade earlier. However, in the National Comorbidity Study, the prevalence of PTSD was assessed only in a second wave of interviews which were designed to be heavily weighted with persons who, in the first wave, had been found to have psychiatric disorders. As PTSD is more common among

those who have a diagnosis of depression or alcohol or drug abuse, weighting the subject pool with persons known to have other disorders would likely result in a biased high estimate of PTSD.

There is relatively little information available about whether children and adults are equally vulnerable to the same types of trauma. Existing evidence suggests that in the face of what is perceived to be a life-threatening event, vulnerability to PTSD is not dependent on age or stage of development. However, it is possible, even likely, that adults may have a broader perception of what constitutes life-threatening danger. In addition, there seems to be general agreement that the nature of PTSD symptomatology may be quite different for children. Instead of the subjectively painful re-experiencing of the trauma so common in adults, children may instead engage in ritualistic play which focuses on the traumatic event. Similarly, **the characteristic symptom of hyperarousal seen in adults is often substituted in children with reckless behavior and somatic symptoms.** The somewhat muted symptoms seen in childhood may be due to the presence of supportive, protective parents. It is likely that **parental nurturing in the immediate posttrauma phase could modify the expression of PTSD symptoms in childhood.** In adolescence, the manifestation of PTSD tends to be more like that seen among adults.

The role of adult caretakers is supportive only in so far as the trauma experienced is not caused by parents/caretakers. Research on veterans has indicated that **soldiers who have experienced severe combat trauma are more likely to exhibit full-blown PTSD if they had a prior history of child abuse.** This suggests that abuse by parental figures casts a long shadow on how one copes with trauma in later life. In her article on childhood traumas, Terr<sup>[21]</sup> points out that **children who have experienced chronic physical and/or sexual abuse by parents cope with the trauma by relying heavily on the psychological defenses of denial and dissociation.** It is possible that such children have to cope with the insoluble ambiguity in which their protector is also the perpetrator of the trauma. Gaining mastery over the trauma would involve confrontation or disclosure, which would potentially imply the loss of their protector. Children faced with this opposing bind are likely to rely on denial and dissociation as the most effective means of coping under the circumstances. While these are reasonable adaptive mechanisms for children who have no other options, they are counterproductive in adulthood. However, as all individuals tend to rely on what was effective for them in the past, it is not surprising that adults who were abused as children have such a difficult time gaining mastery over subsequent severe trauma.

**PTSD has serious long-term negative effects on subjective well-being, on social and occupational adjustment, and on the development of substance abuse. Because of these potential consequences, PTSD that occurs during dynamic phases of human development is particularly serious.**

Reduction of PTSD could be achieved either through preventive measures that curtail traumatic exposures, especially in the realm of interpersonal violence, or by early, effective treatment. Since PTSD often occurs in the context of other psychiatric disorders, its presence may remain unrecognized especially if the symptoms of other disorders are dominant. Clinicians treating youth for depression, anxiety, or substance involvement should be cognizant of the possibility of concurrent, underlying PTSD.

Research on treatment modalities has focused predominantly on adult populations, and more work needs to be done on treatments for this disorder in youth. Current treatments -- psychological, behavioral or pharmacologic -- require objective assessment of their efficacy in childhood and adolescence. Given the seriousness of PTSD when it occurs prior to adulthood, and given the frequency of traumatic exposures that can lead to PTSD, attention to effective treatment should be a priority.

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