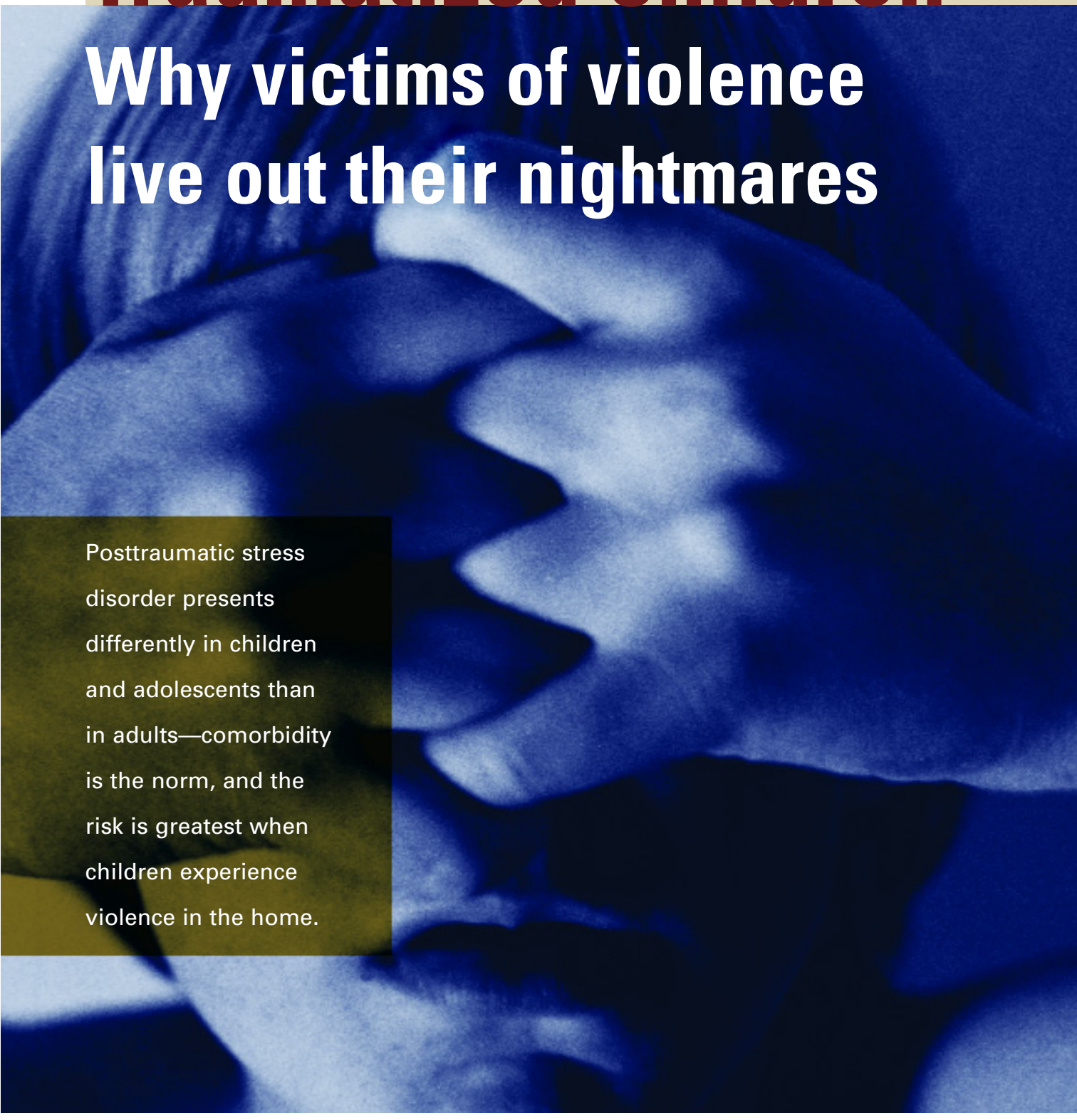
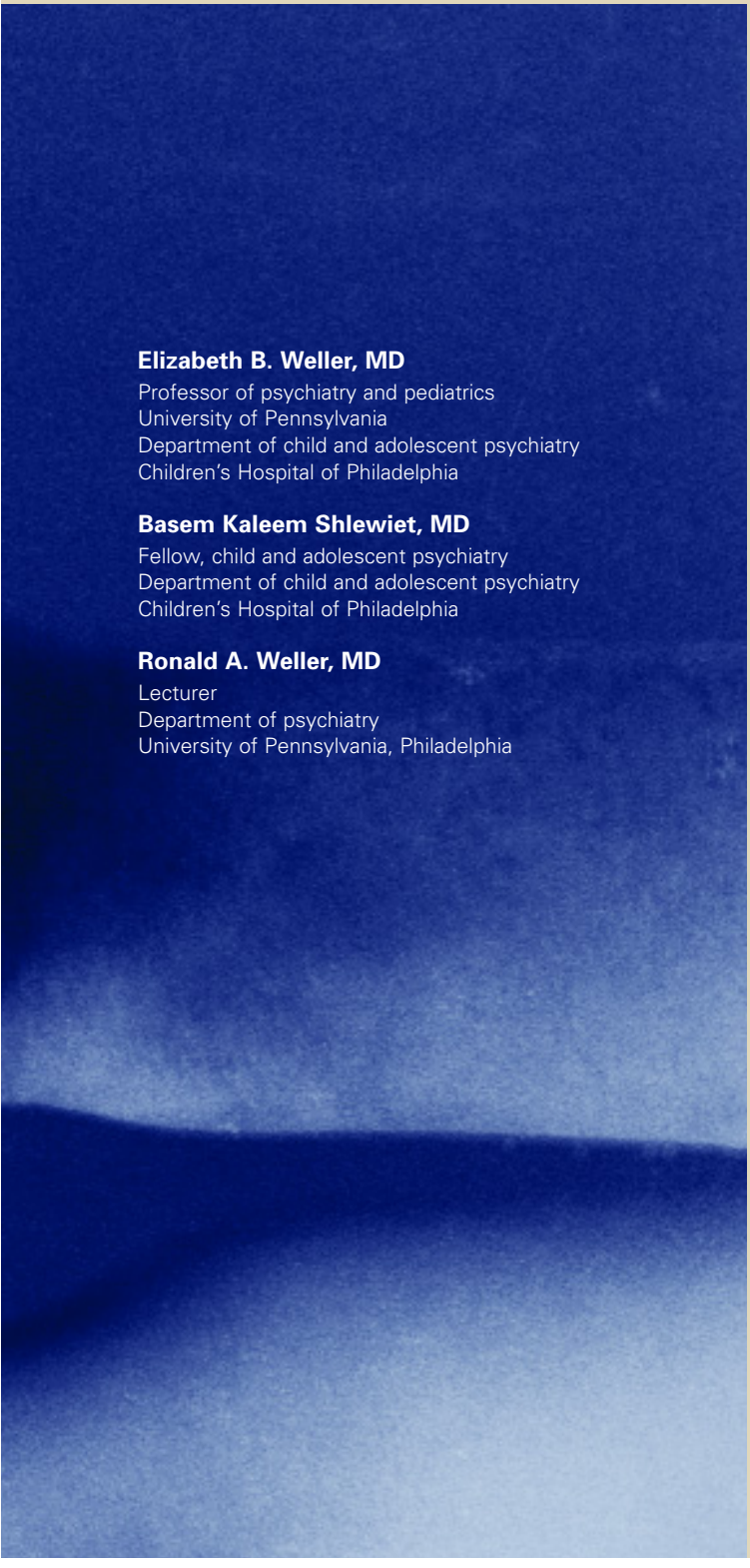
Traumatized children

Why victims of violence live out their nightmares



Posttraumatic stress disorder presents differently in children and adolescents than in adults—comorbidity is the norm, and the risk is greatest when children experience violence in the home.

Current PSYCHIATRY



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Steven, age 6, lives in a foster home and attends an intensive day program for treatment of severe aggressive and violent episodes, for which he has been hospitalized several times. The boy has been separated from his biological mother for 2 years, and her parental rights have been terminated because of allegations of neglect and severe abuse.

Steven's mother has a long history of substance abuse. Her boyfriend, who lived with her, abused Steven physically and sexually. He beat him, tortured him, and burned him. He once inserted a hot curling iron into the boy's rectum, causing severe burns.

It is not unusual for psychiatrists to encounter children such as Steven who have experienced abuse, trauma, or a life-threatening event, but the psychological aftermath of these experiences has only recently been fully recognized. Diagnostic criteria continue to change with evidence that posttraumatic stress disorder (PTSD) manifests differently in children and adolescents than in adults. Now research is showing changes in brain physiology in children who have experienced maltreatment.

Based on our experience and recent evidence, we discuss important features of PTSD that are being recognized in children and adolescents and describe trends and acceptable practices in treating this chronic, debilitating illness.

Diagnostic criteria

PTSD is reported to occur in 1 to 14% of the general population of children[1] and in 3 to 100% of children at risk (those exposed to violence, trauma, or abuse).[2,3] As diagnostic criteria have changed over the years, so may have prevalence rates.

PTSD was recognized as a diagnostic entity in adults in DSM-III and in children and adolescents in DSM-III-R. PTSD in children has a somewhat different presentation and expression of symptoms than in adults. According to DSM-IV-TR diagnostic criteria:

Box 1

DSM-IV-TR: POSTTRAUMATIC STRESS DISORDER

Criterion A: Exposure to trauma

The person has been exposed to a traumatic event in which both of the following are present:

1. The person experienced, witnessed, or was confronted with an event or events that involved actual or threatened death or serious injury, or a threat to the physical integrity of self or others.
2. The person's response involved intense fear, helplessness, or horror. Note: Children may express this by disorganized or agitated behavior.

PROPOSED CHANGE FOR YOUNG CHILDREN

Children need not exhibit intense fear at the time of the trauma.

Source: Adapted from DSM-IV-TR and Scheeringa et al. *J Am Acad Child Adolesc Psychiatry* 1995;34:191-200.

- A child's response to a stressful event may be expressed as disorganized or agitated behavior instead of intense fear, helplessness, or horror.
- Children re-experience and express the traumatic event or aspects of it through repetitive play.
- Children's dreams may be frightening but without recognizable content, or they may change into generalized nightmares of monsters, of rescuing others, or of threats to self or others.
- Children also tend to have more psychosomatic complaints, such as headaches and stomachaches, than adults with PTSD.[1]

Age-related symptoms. Appropriate diagnostic criteria for childhood PTSD have been debated for some time, in part because of differences in children's symptoms at different ages and developmental stages. Since DSM-IV was introduced in 1994, several researchers have recommended modifications to its diagnostic characterizations of childhood PTSD.

To accommodate the developmental stage of children younger than age 4, for example, Scheeringa et al suggested changes to DSM-IV criteria for PTSD.[4,5] These changes (*Boxes 1-5*) are included in the American Academy of Child and Adolescent Psychiatry's guidelines for assessing and treating PTSD[6] and may be a valuable tool for the clinician treating young children.

Subsyndromal cases. Children whose symptoms fall below the diagnostic criteria for PTSD may demonstrate substantial functional impairment and distress, according to Carrion et al.[7] In fact, these researchers found that children who fulfill the requirements for two of three symptom clusters—Cluster B, re-experiencing (*Box 2*); Cluster C, avoidance and numbing (*Box 3*); and Cluster D, hyperarousal (*Box 4*)—do not differ significantly from children who meet criteria for all three symptom clusters. Therefore—the researchers reported—the absence of this triad does not necessarily indicate a lack of posttraumatic stress in children but may stem from "developmental differences in symptom expression."

Vulnerability. Traumatic experience contributes to PTSD development, and the "vulnerable, anxious child who is exposed to violence appears to be at greater risk," according to Silva et al.[8] After a regression analysis of 59 traumatized children, the research team concluded that PTSD risk is greatest when violence occurs within the family.

A review of 25 studies found that three factors appear to mediate the development of PTSD in children:

- the severity of the trauma exposure
- trauma related to parental distress
- temporal proximity to the traumatic event.[9]

Chronicity. PTSD is a long-lasting, chronic disorder for young patients. Symptoms have been found to persist in one-third of children 2 years after the initial diagnosis.[10]

Comorbidity in childhood PTSD is the norm. Among the conditions frequently encountered with childhood PTSD are major depression, dysthymia, substance abuse, anxiety disorder, attention-deficit/hyperactivity disorder (ADHD), conduct disorder, and oppositional defiant disorder.

Steven's story, continued. *At psychiatric referral, Steven had a history of aggression towards other children. He had no friends and usually played alone. He had difficulty sleeping and awoke frequently during the night. Several times daily he displayed temper tantrums with kicking and screaming.*

The boy was unable to discuss the abuse that had happened to him but displayed severe aggression when playing with dolls in the office. He stripped off their clothes, examined their private parts, then ripped them apart or threw them across the room. His lan-

guage development showed significant delays, both in expression and comprehension.

Organic basis for PTSD in children?

Studies of the hypothalamic-pituitary-adrenal (HPA) axis and of brain volume have revealed physiologic changes that may indicate PTSD in children. These changes could be the result of PTSD or a risk factor for its development.

HPA axis dysregulation. One of the first controlled studies of biological and physiologic changes in children with PTSD found elevated levels of dopamine, norepinephrine, and free cortisol in 24-hour urine specimens of maltreated children. Urinary catecholamine and free cortisol concentrations were positively correlated with the duration of PTSD trauma and symptom severity.[11,12]

Elevated afternoon salivary cortisol levels have been found in depressed, maltreated children compared with depressed children who had not been maltreated.[13] Girls ages 5 to 7 who had been abused in the past 2 months were found to have *lower* salivary cortisol levels than normal controls.[14] A controlled study found significantly elevated salivary cortisol levels in 51 children with PTSD, compared with 31 controls. Interestingly, cortisol levels in the PTSD group were significantly higher in girls than in boys.[15]

The effect of trauma on the HPA axis in children requires more research. Although these studies produced contradicting results, elevated cortisol levels seem to be found more consistently than depressed cortisol levels. The differences in outcome could be related to the groups studied or to variations in adrenal system response among subjects.

Brain volume. Changes in brain volume have been measured in maltreated children using MRI readings analyzed with IMAGE software developed by the National Institutes of Health. Intracranial and cerebral volumes of 44 children with PTSD were found to be smaller than those of 61 matched controls.[12] Specifically:

- Children who experienced abuse at the earliest ages and for the longest periods had the smallest brain volumes.
- Maltreated children with the smallest brain and corpus callosum volumes displayed the most severe PTSD symptoms (intrusive thoughts, avoidance, hyperarousal, and dissociation).
- Corpus callosum areas and cerebral volumes were reduced more in maltreated boys than in maltreated girls.
- Hippocampal volumes were not decreased in maltreated children, unlike findings reported in adults with a history of PTSD.

In a recent study, the same researchers[16] reported that superior temporal gyrus gray matter volumes measured with MRI were larger in 43 maltreated children and adolescents compared with controls, but white matter volumes were small-

Box 2

DSM-IV-TR: POSTTRAUMATIC STRESS DISORDER

Criterion B: Re-experiencing

The traumatic event is persistently re-experienced in one (or more) of the following ways:

1. recurrent and intrusive distressing recollections of the event, including images, thoughts, or perceptions. Note: In young children, themes or aspects of the trauma may be expressed in repetitive play.
2. recurrent distressing dreams of the event. Note: Children may experience frightening dreams without recognizable content.
3. acting or feeling as if the traumatic event were recurring (includes a sense of reliving the experience, illusions, hallucinations, and dissociative flashback episodes, including those that occur upon awakening or when intoxicated). Note: In young children, trauma-specific re-enactment may occur.
4. intense psychological distress at exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.
5. physiological reactivity on exposure to internal or external cues that symbolize or resemble an aspect of the traumatic event.

PROPOSED CHANGE FOR YOUNG CHILDREN

Only one re-experiencing symptom is required from the following

1. posttraumatic play
2. play re-enactment
3. recurrent recollection
4. nightmares
5. episodes of objective features of a flashback or dissociation

Source: Adapted from DSM-IV-TR and Scheeringa et al. *J Am Acad Child Adolesc Psychiatry* 1995;34:191-200.

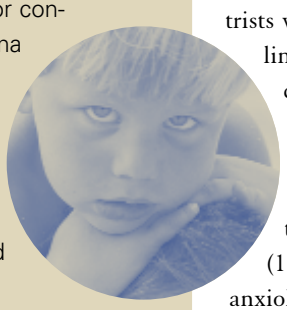
Box 3

DSM-IV-TR: POSTTRAUMATIC STRESS DISORDER

Criterion C: Avoidance and numbing

Persistent avoidance of stimuli associated with the trauma and numbing of general responsiveness (not present before the trauma), as indicated by three (or more) of the following:

1. efforts to avoid thoughts, feelings, or conversations associated with the trauma
2. efforts to avoid activities, places, or people that arouse recollections of the trauma
3. inability to recall an important aspect of the trauma
4. markedly diminished interest toward participation in significant activity
5. feeling of detachment or estrangement from others
6. restricted range of affect (e.g., unable to have loving feelings)
7. sense of a foreshortened future (e.g., does not expect to have a career, marriage, children, or a normal life span)



PROPOSED CHANGE FOR YOUNG CHILDREN

Only one symptom is needed from the following:

1. constriction of play
2. socially more withdrawn
3. restricted range of affect
4. loss of acquired developmental skills (especially language and toilet training)

Source: Adapted from DSM-IV-TR and Scheeringa et al. *J Am Acad Child Adolesc Psychiatry* 1995;34:191-200.

er in the maltreated group. The authors suggested these findings may represent developmental alterations in maltreated children. Other MRI studies have found:

- attenuation in frontal lobe asymmetry and smaller total brain and cerebral volumes in children with PTSD, compared with controls[17]
- a lower N-acetylaspartate/creatine ratio in children with PTSD, which suggests altered anterior cingulate neuronal metabolism.[18]

These apparent changes in brain architecture and metabolism may have functional implications. Children with PTSD have been found to perform more poorly than do controls on measures of attention, abstract reasoning, and executive functioning.[16]

PTSD treatment in children

Treatment of PTSD in children is strongly influenced by the adult literature and practice guidelines. Most psychiatrists who treat children endorse drug therapy as the first line of treatment, followed by psychodynamic psychotherapy and cognitive-behavioral therapy (CBT). In a recent survey of treatment practices in childhood PTSD, 95% of psychiatrists endorsed the use of medications such as selective serotonin reuptake inhibitors (SSRIs) (47 to 49%), alpha-agonists (16 to 38%), tricyclic antidepressants (11 to 15%), and anxiolytics (12%).

Nonmedical therapists who were included in the survey endorsed the use of eye movement desensitization and reprocessing, CBT, family therapy, and nondirective play therapy.[19]

Psychotherapy. Preliminary evidence from five controlled trials indicates that CBT may be an effective first-line treatment for children and adolescents with PTSD:

- In a study of 100 sexually abused children, PTSD symptoms improved significantly more when children received CBT alone or with their parents, compared with when only their parents received CBT.[20] Externalizing and depressive symptoms improved greatly when a parent was included in the child's treatment, and this improvement was maintained 2 years later.[21]
- A randomized study of 80 sexually abused children found little difference between those who received traditional group therapy and others who received group therapy plus CBT.[22]
- CBT was found more effective than nondirective supportive therapy in sexually abused preschool children, both initially and at 6- and 12-month intervals, as well as in children ages 7 to 14.[23,24]
- After an earthquake in Armenia, children treated with school-based, grief/trauma-focused CBT showed significant improvement on self-reported measures of PTSD and depressive symptoms, compared with children who received no such treatment.[25]

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Pharmacotherapy

Open-label case reports and case series have examined a variety of pharmacotherapies in childhood PTSD, but no double-blind, placebo-controlled studies have been published.

Propranolol. Eleven children with histories of sexual and/or physical abuse exhibited significantly fewer PTSD symptoms during a 5-week regimen of the beta blocker propranolol than either before or after they received the medication.[26]

Carbamazepine was given to 28 children and adolescents ages 8 to 17 with a primary diagnosis of PTSD. Complete symptom remission was observed in 22 children, and the other 6 had significant improvement—reporting only abuse-related nightmares. Carbamazepine dosages of 300 to 1,200 mg/d yielded serum levels of 10 to 11.5 mcg/ml.

Subjects with comorbid conditions (one-half the sample) required additional medications. Four children with ADHD received stimulants, three with major depressive disorder received SSRIs, and one patient was given imipramine.[27]

Clonidine treatment resulted in moderate or greater improvement in target symptoms of PTSD in seven preschool children ages 3 to 6 with a history of severe sexual and/or physical abuse. Clonidine dosages ranged from 0.1 mg at bedtime to 0.05 bid plus 0.1 at bedtime.[28]

SSRIs and other antidepressants. Citalopram was given in a comparison study to 24 children and adolescents and 14 adults with PTSD, with symptoms assessed every 2 weeks based on Clinician Administered PTSD Scale (CAPS) and Clinical Global Impression (CGI) scores. Mean CAPS total score, symptom cluster score, and CGI ratings were significantly reduced in both age groups. Children and adolescents showed greater improvement than adults in hyperarousal symptoms but less in re-experiencing and avoidance symptoms.[29]

An 8-year-old girl with PTSD and comorbid anxiety disorder initially responded to fluvoxamine. When she relapsed, mirtazapine was added and her overall symptoms improved.[30]

An adolescent with PTSD treated with nefazodone, up to 600 mg/d, showed improvement in hyperarousal symptoms and anhedonia.[31]

Summary. In the absence of conclusive scientific evidence—i.e., double-blind, placebo-controlled studies—these case reports reflect common practices in treating PTSD in children and adolescents. American Academy of Child and Adolescent Psychiatry practice guidelines defer to the psychiatrist's judgment to determine the best pharmacologic approach.[6] In most cases, evidence from the adult literature influences treatment decisions, and in some cases treatment targets comorbidities such as depression, panic disorder, ADHD, and anxiety.

Box 4

DSM-IV-TR: POSTTRAUMATIC STRESS DISORDER

Criterion D: Hyperarousal

Persistent symptoms of increased arousal (not present before the trauma), as indicated by two (or more) of the following:

1. difficulty falling or staying asleep
2. irritability or outbursts of anger
3. difficulty concentrating
4. hypervigilance
5. exaggerated startle response

PROPOSED CHANGE FOR YOUNG CHILDREN

1. night terrors
2. difficulty going to sleep
3. night awakening
4. decreased concentration
5. hypervigilance
6. exaggerated startle response

Source: Adapted from DSM-IV-TR and Scheeringa et al. *J Am Acad Child Adolesc Psychiatry* 1995;34:191-200.

Confronting Steven's demons. *Steven was treated with paroxetine, 15 mg/d, targeting both his depressive and PTSD symptoms; clonidine, 0.05 mg at bedtime, targeting hyperarousal symptoms and ADHD; and risperidone, 0.5 mg bid, which was added last to target his severe aggression and violent behavior.*

He also received speech therapy, milieu treatment with the structured setting at the day program, and individual play therapy from the day program's interns. At home, wrap-around services—including a behavioral specialist and a therapeutic staff support worker—were provided to help his foster family deal with his aggression and difficult behavior.

Conclusion

Current approaches to diagnosis, assessment, and treatment of PTSD in children and adolescents depend in large part on the

Box 5

DSM-IV-TR: POSTTRAUMATIC STRESS DISORDER

Criterion E: Duration of symptoms

Duration of the disturbance (symptoms in Criteria B, C, and D) is more than 1 month.

PROPOSED CHANGE FOR YOUNG CHILDREN

The disturbance has been present for 1 month

Appearance of new symptoms (only one is needed)

1. new aggression
2. new separation anxiety
3. fear of toilet training alone
4. fear of darkness
5. any new fears not related to the trauma

Criterion F: Impairment in functioning

The disturbance causes clinically significant distress or impairment in social, occupational, or other important areas of functioning.

PROPOSED CHANGE FOR YOUNG CHILDREN

Function impairment is not needed for the diagnosis

Source: Adapted from DSM-IV-TR and Scheeringa et al. *J Am Acad Child Adolesc Psychiatry* 1995;34:191-200.

few available studies conducted in adults, which may not necessarily apply to younger patients. We need more clinical trials involving children and adolescents, better diagnostic instruments, and accurate symptom severity rating scales.

Bottom Line

Posttraumatic stress disorder in children and adolescents is chronic and debilitating. Agitation, psychosomatic complaints, and psychiatric comorbidity are common. Reduced brain volumes in traumatized children may explain changes in attention, reasoning, and verbal skills.

Related resources

- National Center for PTSD. www.ncptsd.org
- International Society for Traumatic Stress Studies. www.istss.org
- The PTSD Alliance. http://www.ptsdalliance.org
- National Center for Children Exposed to Violence (NCCEV) http://www.nccev.org

DRUG BRAND NAMES

Carbamazepine • Tegretol
Citalopram • Celexa
Clonidine • Catapres
Fluvoxamine • Luvox
Imipramine • Tofranil
Mirtazapine • Remeron
Nefazodone • Serzone
Paroxetine • Paxil
Propranolol • Inderal
Risperidone • Risperdal

DISCLOSURE

Dr. Elizabeth Weller reports that she receives research/grant support from Forest Pharmaceuticals, Organon, and Wyeth Pharmaceuticals, and serves as a consultant to Johnson & Johnson, GlaxoSmithKline, and Novartis Pharmaceuticals Corp.

Dr. Shlewiet reports no affiliation or financial arrangement with any of the companies whose products are mentioned in this article, or with manufacturers of competing products.

Dr. Ronald Weller reports that he receives research/grant support from Wyeth Pharmaceuticals, Organon, and Forest Pharmaceuticals.

Research is leading to new understandings of PTSD in childhood, from more refined diagnostic criteria to observations of changes in brain volume and secretion of stress hormones in maltreated children. Case reports are exploring the safety and efficacy of drug and psychotherapeutic treatments.

Acceptable treatment and management—as indicated by case reports and recommended by the American Academy of Child and Adolescent Psychiatry—includes CBT or dynamic psychotherapy, group therapy, and drug treatment, especially for PTSD's comorbidities.

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