Effects of Terrorist Attacks on the Elderly—Part II: Posttraumatic Stress, Acute Stress, and Affective Disorders

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This is the second of a two-part article that examines the effects of terrorism on the elderly. Part I reviewed the medical complications caused by biologic, nuclear, chemical, and bombing attacks. This article focuses on the practical issues of resilience and the identification of those elderly persons who are prone to developing psychiatric disorders following a terrorist attack. The three most commonly occurring psychiatric disorders following such an attack—posttraumatic stress disorder (PTSD), acute stress disorder, and depression—are reviewed. Special note is made of areas where these conditions are similar in their presenting symptoms and the high comorbid overlap between them. Specific research from recent terror events, such as the Oklahoma City bombing, the Tokyo subway sarin attack, the September 11, 2001, attacks, and the London subway bombings of July 7, 2005, are examined.

INITIAL REACTION

Although this article focuses primarily on the long-term psychiatric sequelae following a terrorist attack, it should be noted that many people will experience brief reactions to this stress (ie, acute stress disorder and/or acute adjustment disorders).[1] These reactions usually persist for a short period of time (days to weeks) and consist of mild-to-moderate anxiety, insomnia, increased arousal, excessive worry, and/or saddened or depressed mood.

A national phone survey by Schuster et al[2] conducted 3-5 days after September 11, 2001, reported that 44% of American adults experienced substantial symptoms of acute stress. In a similarly designed study conducted 11-13 days after the July 7, 2005, London bombing attacks, 32% of the population over age 65 reported symptoms of significant acute stress.[3] In a national September 11 follow-up study conducted by Silver and colleagues,[4] it was noted at the 2-month mark that 17% of the study group suffered stress reactions; that number dropped to 5.8% at the 6-month follow-up.[4] Generally, stress symptoms decreased in both prevalence and intensity with the passage of time.

It is important for physicians to be supportive and reassure patients that these experiences are not necessarily pathological, but may represent normal reactions to abnormal situations, and that most peo-

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TABLE I

Characteristics for Resilience[5,6,8,11,12]

Good Responses	Poor Indicators for Resilience
Optimistic outlook	Pre-existing psychiatric diagnosis
Sense of belonging	Poor pre-event coping skills
Sense of contributing	Poor health status
Actively engaged	Limited support or resources
Finding meaning in events	Degree life disrupted
Good responses to past disaster	Degree loved ones' lives disrupted
Familiar setting and routines	Individual history of disruptive past experiences
Higher education level	Degree of emotional involvement
Feeling of available resources	Physical limitations
	Sensory loss or impairment
	Isolation
	Relocation (acute or chronic) (ie, nursing home)
	Severity of trauma experienced
	Feeling unsafe afterward
	Feeling of loss of control

ple return to their previous level of functioning in a few months. It is when people have longer-term reactions that last several weeks to months and/or are so disturbed by the events that they become incapacitated (ie, depression, intrusive thoughts, isolation, uncontrolled crying, hallucinations, increased drug or alcohol use, panic attacks, and/or psychological immobilization that prevents return to normal function) that these reactions should be considered pathological, and psychiatric intervention should be sought.

RESILIENCE IN THE ELDERLY

Resilience can be defined as the successful adaptation of an individual to difficult or challenging life experiences.[5] There are two leading theories defining the resilience of older patients to terrorism. The first is that the elderly are less vulnerable to psychological stress due to their more mature cognitive/coping skills and more optimistic attitudes, owing to their greater life experiences.[5-11] This has been coined as the "inoculation theory" or "inculcation theory" of resilience. The second theory defines the elderly as more vulnerable to stress due to their higher prevalence of comorbid disease states, limited abilities to respond and be helpful during a time of crisis, reduced reserve due to lifelong accumulated stress, and a history of emotional contagion from accumulated previous traumas, which adversely affect their ability to adjust to current stressors.[5-11] Neither theory applies globally to the elderly, and each case, as with younger patients, must be viewed as unique.[10]

The four major areas in assessing an elderly person's ability to respond to an acute stressful event are: (1) How good are the individual's coping skills in general? (2) How has he or she responded to past stress? (3) Does he or she have a history of mental illness or physical limitations? (4) How has he or she been impacted by the unique factors of the current situation? [4,8,11,12] (Table I).

IDENTIFICATION OF PSYCHIATRIC ILLNESS

One of the biggest problems clinicians experience in identifying and treating geriatric psychiatric conditions is that older persons often have abnormal disease presentations.[13] The emotionally traumatized elderly frequently present with a wide array of general somatic complaints and minimally defined psychiatric symptoms.[13] The reason for this somatic preponderance of initial symptoms is postulated to involve several factors, including the stigma older people feel when seeking psychiatric

help, the natural progression of diseases they encounter with aging, and the general neurocognitive changes associated with aging.[5,6,8,11,13]

The stress caused by terrorism may also result in a different presentation of symptoms than one encounters in similar patients who experience natural disasters or other traumas.[7,8,14-17] Studies of patients who experienced the September 11 attacks and the Oklahoma City bombing reported that those patients who experienced panic attacks or significant anxiety at the time of the event were more likely to later develop PTSD symptoms, while studies of natural disasters found that peritraumatic dissociation was the strongest predictor of subsequent PTSD.[7,14,15,17,18] The severity of PTSD was higher following terrorist attacks, and the condition was more severe and persistent compared to the PTSD that occurred after a natural disaster. Factors influencing the increased severity of PTSD include: (1) the fact that the attack was man-made and the result of an intentional act; (2) a loss of confidence in social structures and the government's ability to respond and protect; (3) long-term feelings of increased vulnerability; and (4) an inability to relax and feel safe anywhere at any time.[17,19]

RATES OF PTSD

The estimated rates of PTSD following terrorist attacks range from 7.5% to approximately 80%, depending on the site of the study, the time sampled after the event, and whether the study focused on the general population or on victims who had been directly affected.[15,16,18-27] The initial studies of PTSD in residents of Manhattan, 1-2 months after September 11, showed a prevalence of 7.5%, up from the 1999 Surgeon General's baseline national rate of 3.6%.[15] Studies looking at the rate of PTSD in patients treated in the Saint Luke's Hospital emergency room after the 1995 Tokyo subway sarin attacks revealed a PTSD rate of 7.8% at 6 months and 2.2% at the end of 2 years.[16] The same sample population was studied again at 5 years using similar but different criteria, and with different primary investigators conducting the study. The 5-year follow-up showed a PTSD rate of 32%, which highlights the difficulties in interpreting this data.[16]

In general, the elderly experience PTSD at the same rate and severity or slightly less than the general population following a terrorist attack.[17,22,28] In a study of bombings in France from the mid-1990s, Verger et al[20] found that victims in the age range of 35 to 54 years were the most vulnerable to developing PTSD, with a prevalence rate at 37.5%, while victims over age 55 had a prevalence rate of 31%. It is interesting that age-related studies of PTSD following major natural disasters show no significant age-defined differences between populations in terms of prevalence, except for a slightly lower overall prevalence rate of PTSD in the elderly (13.6%).[7]

An empiric review by Norris et al,[17] which looked at data on 60,000 trauma survivors, found general trends similar to those reported in Verger's study. Both found that individuals at greatest risk for developing psychiatric symptoms were those who: (1) were exposed to violence (ie, terrorism); (2) had a greater level of exposure; (3) were middle-aged; (4) were of female gender; (5) had a prior psychiatric history, particularly one of anxiety, depression, alcoholism/drug abuse, or personality disorder; and (6) had limited social support.[17]

In a study by Abenhaim et al[22] that examined the rate of psychiatric disorders in survivors of terrorist attacks in France, there was a difference in

prevalence based upon the degree of injury suffered from the attack. The rate of PTSD was 10.5% for those who were not injured or who had received a minor injury, 8.3% for those with moderate injuries, and 30.7% for those with severe injuries.[22] The lower rate of PTSD in the moderately injured was felt to be due to the fact that those with moderate injury received more medical attention, support, and resources when compared to the uninjured or those with minor injuries. These interventions resulted in lower rates of PTSD. Factors such as proximity to the event, the occurrence of long-term injuries, the severity of pain experienced, and the degree to which one felt his or her life was threatened, disrupted, or permanently changed have been hypothesized to explain the threefold increase in the PTSD experienced by the more severely injured.

Livingston et al[23,24] studied PTSD and its impact on the elderly after the bombing of Pan Am Flight 103 over Lockerbie, Scotland, in 1988. When the data from these studies are reviewed, one needs to remember that the cases were referred to the research group by solicitors, and that compensation litigation was underway at the 1-year mark. In their first study, 1 year after the event, these investigators found that approximately 83% of the elderly (n = 31; mean age, 74) met criteria for PTSD by *Diagnostic and Statistical Manual of Mental Disorders, Third Edition* (DSM-III), criteria, with loss of family or friends being the predictor most strongly associated with the development of symptoms.[23,24] This rate was similar to that experienced by their younger population sample.[23] At the 3-year follow-up, after litigation had been settled, only 16% (n = 19) still met criteria for PTSD, but three of the original 31 participants refused follow-up because it was too distressing for them.[24] Of those elderly persons who participated in the follow-up, all demonstrated improvement in their PTSD symptoms, particularly in somatic complaints, anxiety, insomnia, avoidance, and social dysfunction.

DIAGNOSIS OF PTSD

The diagnosis of PTSD requires exposure to a severe, horrific, or life-threatening traumatic event, with the individual suffering symptoms in three separate categories, generally identified as:

1. *Re-experiencing*—recurrent intrusive recollections of the event, recurrent distressing dreams, re-experiencing the event as dissociative flashbacks, hallucinations, delusions with intense distress, or physiological reactivity.
2. *Avoidance/numbing*—avoiding thoughts, feelings, or conversations about trauma; avoiding activities, people, or places that arouse recollections; inability to recall important aspects of the trauma; diminished interest in activities; feeling of detachment or estrangement; restricted range of affect; inability to have loving feelings; or a sense of foreshortened future.
3. *Increased physiologic arousal*—difficulty falling asleep or staying asleep, irritability or outbursts of anger, difficulty concentrating, hypervigilance, or exaggerated startle response.

These symptoms must persist for at least 1 month and cause significant distress or impairment in social, occupational, or other important areas of function.[29]

Acute stress reaction is the diagnosis for similar symptoms that are usually emotional and dissociative in nature, which last from at least 2 days up to 1 month.[29,30] The most common symp-

toms include: numbing, detachment, or the absence of emotional responsiveness; reduced awareness of surroundings (ie, being in a daze); derealization; dissociative amnesia (can't recall important elements of the trauma); anxiety; increased arousal; recurrent thoughts or images of the event; dreams or nightmares of the event; flashbacks; avoidance of thoughts of the trauma; irritability; poor concentration; motor restlessness; pacing; inner tension; hypervigilance; or exaggerated startle response.

If acute stress reactions persist for longer than 1 month, then the individual often meets the criteria for PTSD. Time qualifiers for describing PTSD include *acute* (if symptoms last less than 3 months), which accounts for 50% of cases, and *chronic* (if symptoms last longer than 3 months).[29] If symptoms do not present until 6 months or later after the event, then the PTSD is considered to be *delayed onset*.[29] Factors associated with delayed-onset PTSD in the elderly include: (1) loss of function, as typically evidenced by deteriorating physical health or neurocognitive decline; (2) increased environmental stressors, such as disruption of living quarters, and/or lack of funds, transportation, or caretaking; and (3) loss of social outlets.[30-34] The geriatric psychiatric literature suggests that PTSD has a waxing and waning lifetime course, which makes the detection of delayed PTSD more of an issue in the elderly.[6,8,29-31,33,34] It has been hypothesized that the development of certain neurological conditions—particularly dementia and/or frontal lobe syndromes—can result in the return of previously resolved PTSD symptoms or the onset of de novo symptoms years after the event.[6,8,31]

Exposure to a traumatic or stressful event has been broadly defined as experiencing, witnessing, or being confronted with (third-person retelling of an account, or possible video exposure) an event that involves injury or death (actual or threatened) to self or others and induced intense fear, helplessness, or horror.[29,35] A study from Israel by Bleich et al[9] noted that television was a more pronounced source of exposure to stress and was more anxiety-provoking in the "old-old" (> 74 yr) than in other age groups. The study concluded that TV exposure made some people feel more like direct victims of terrorism and initiated the development of psychiatric sequelae, especially when it was watched for extended periods of time or when patients saw the same traumatic event replayed over and over again.[9]

Posttraumatic stress disorder avoidance symptoms, which are similar to depressive symptoms, include a sense of foreshortened future, diminished interest in activities, a restricted affect, and/or feelings of detachment or estrangement.[29] Three or more of the above avoidance symptoms are necessary for a diagnosis of PTSD.[29] The cause of the avoidance is not better explained by other neurocognitive syndromes, such as amotivation associated with head trauma or other psychiatric disorders.[29,35]

The increased arousal of PTSD is usually manifested by an increased or exaggerated startle response and hypervigilance, as well as other symptoms more commonly associated with depression, such as difficulty falling asleep, irritability, and decreased concentration.[29] Two or more arousal symptoms are necessary for a diagnosis of PTSD. It is important to remember that the elderly are more likely to experience concentration and memory problems at baseline than the general population. Therefore, in order to meet criteria, there needs to be a new onset or worsening of

symptoms from pre-event levels.[8,29]

RATES OF DEPRESSION

In the previously mentioned studies examining psychiatric symptoms in New Yorkers following the September 11 attack, the point prevalence of depression increased to a rate of 9.7%, nearly doubling its previously reported baseline of 4.9%.[15] In Abenhaim et al's study[22] of the victims of terrorist attacks, the point prevalence rate of depression was found to be 13.3%. These studies show that depression occurs at a lower rate than PTSD, but it is nonetheless a significant reaction, occurring at a rate two to three times higher than expected in the general population.

Boscarino and colleagues,[36] in a study of New Yorkers following September 11, found that people suffering from depression were more likely to seek mental health services than those suffering from other psychological sequelae, such as PTSD or anxiety. It was noted that there was a temporary spike in mental health visits during the first 2 months following the attack, which returned to pre-event levels by the fifth month. Only 4.3% of persons older than age 65 sought mental health services, while 10.5% of those between the ages of 45 and 64 used such services. Even though the total number of psychiatric treatment visits returned to baseline at 5 months, the total amount of psychiatric medications prescribed to New Yorkers increased from a pre-event level of 6.8% of the population to 7.7% at the 5-month mark.

TABLE II

Mnemonic "SIGE M CAPS" for the Diagnostic Symptoms of Depression

S = Changes in **S**leep
I = Lack of **I**nterest or anhedonia
G = Feelings of excessive or inappropriate **G**uilt, or negative self-attitude
E = Decreased **E**nergy

M = Low **M**ood

C = Decreased **C**oncentration (unable to follow TV show or newspaper article)
A = Decreased or increased **A**ppetite
P = Decreased **P**sychomotor activity
S = Presence of **S**uicidal ideation

DIAGNOSIS OF DEPRESSION

To make a diagnosis of depression by the DSM criteria, a patient needs to be suffering from a minimum of five out of nine mood-related symptoms[29] (Table II). Symptoms of depression typically seen in the elderly include multiple somatic complaints, particularly fatigue, headache, gastrointestinal disturbances, and arrhythmias; trouble concentrating; diminished memory; and lack

TABLE III

Presentation of Masked Depression in the Elderly

- Anxiety, worry, rumination
- Focus on multiple somatic complaints
- Helplessness
- Hopelessness
- Irritability
- Lack of interest in personal care
- Lassitude
- Loss of feelings of pleasure (anhedonia)
- Memory complaints with or without objective signs of cognitive impairment
- Minimizing or denying presence of mood-related symptoms
- Slowed movement
- Unexplained somatic complaints
- Weakness
- Weight loss

TABLE IV

Comorbid Disease Frequency and Other Outcomes Associated With Posttraumatic Stress Disorder[8,11,40]

- Major depression—50-75%
- Anxiety disorder—20-50%
- Phobias—5-37%
- Alcohol abuse/dependence—6-55%
- Illicit drug abuse/dependence—25%
- Increased divorce rate
- Increased unemployment rate
- Increased accident rate
- Increased suicide rate

of initiative.[13,37,38] Symptoms must be present for at least 2 weeks. Elderly persons suffering from depression often present with fewer mood-related symptoms than the general population.[13] The "classical" symptoms that are usually denied or downplayed include overt sadness, depressed mood, anxiety, and/or the loss of interest or pleasure in activities that were formerly enjoyed. This type of presentation is often referred to as a *nondysphoric* or *masked* depression[38,39] (Table III).

COMORBIDITY

The literature suggests that between 44% and 88% of PTSD cases also present with at least one other psychiatric condition, such as depression, substance abuse, or anxiety disorder[8,11,16,28,40] (Table IV). Individuals diagnosed with PTSD and depression have more intense depressive symptoms and are also at increased risk for developing a more chronic and severe form of PTSD.[40] As would be expected, individuals with a previous psychiatric history are at greater risk of developing PTSD and a comorbid condition post-trauma.[40]

There is disagreement in the literature about whether the high comorbid rate seen in patients with chronic PTSD is due to the PTSD imitating other conditions, or multiple conditions truly occurring independently.[40] There is also a concern that cases of primary depression, anxiety disorder, adjustment disorder, and substance abuse are erroneously misdiagnosed as PTSD.[35] To a certain extent, PTSD is an easier diagnosis culturally, socially, and intellectually for both patients and doctors to understand and accept, which may lead to its overdiagnosis. Since its symptoms are almost entirely subjective, it is also one of the most frequently feigned disorders, particularly when litigation is involved.

CONCLUSION

After a terrorist attack, PTSD, acute stress disorder, and affective disorders are common. In addition, there is a high incidence of many psychiatric symptoms, which are fleeting and fail to qualify as a primary disease. Even in the worst-case studies, approximately 70% of the population showed no psychiatric symptoms or meet criteria for a psychiatric diagnosis 3-6 months after a terrorist attack. Many of the psychiatric conditions that are the results of terrorism respond well to treatment, with few long-term or lifetime sequelae.

Because of other illnesses, reduced social support system, cognitive impairment, and increased rates of pre-existing psychiatric disorders, some elderly persons are at higher risk for terrorism-induced psychiatric disorders. It is important for clinicians to look for "masked" depressions and other comorbid diseases (acute stress disorder, PTSD) when assessing the effects of terrorism on elderly patients.

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