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POST-TRAUMATIC RESPONSES TO AERIAL BOMBING

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Abstract—A refugee population exposed to aerial bombing was assessed for psychosocial sequelae within two months. Forty-three members over 15 years were interviewed using a structured questionnaire. Seventy-four percent had experienced an immediate but transient stress reaction. Subsequently, PTSD, anxiety, depressive and somatic symptoms were common. Forty-four percent met the DSM III diagnostic criteria for PTSD. In addition, social withdrawal, irritability and hostility, interpersonal relationship problems and functional disability were found. Although a variety of psychosocial symptoms were seen, it is suggested that part of this response be considered as manifestation of a healthy, normal attempt to cope with a severely traumatizing experience. The effects of collective trauma and social methods of treatment are also described. Copyright © 1996 Elsevier Science Ltd

Key words—war, bombing, Sri Lanka, post-traumatic stress disorder, collective trauma, social methods

INTRODUCTION

Although the man made disaster called war continues to be a well recognized catastrophic stressor causing considerable psychosocial sequelae, few studies have been done on survivors. For example, the type war trauma, their relationship to the consequent psychosocial symptoms, the vulnerability and risk factors in the population and finally the treatment methods have not been established. Most research has been on combatants resulting in the development of the concept of Post-traumatic Stress Disorder, PTSD [1]. The effects of disaster has received considerable attention in recent times [2], which has helped in understanding the theoretical and management aspects of trauma. Detailed studies of civilians exposed to war trauma will add to this growing knowledge.

However, empirical research in a war environment is extremely difficult due to the ongoing conflict, the threat to life and general disorganization. It is becoming increasingly clear that in modern warfare over 90% of casualties are civilians and the aim is to gain control over the civilian population through terror [3]. Thus psychological considerations have become important. In addition to detention, torture and displacement, bombing is one of the major stressors of the war. It would appear that in many instances bombings are used primarily as psychological weapons against civilians, for their ability to accurately hit military targets within densely populated areas is exceptional, as seen in the war in Sri Lanka where the sophistication of instruments is low [4]. At the same time, the guerillas have consistently sought civilian cover, thereby drawing the fire onto the general public. The usually sudden, unexpected and unpredictable nature, the blast and noise of the explosion giving rise to what was called 'shell shock' in World War I; and the massive destruction, injuries and death that follow are the dimensions of the stress. The appraisal of the locus of control external to the victim; a feeling of passivity, helplessness and entrapment; and the impotent rage against the perpetuators are additional experiential factors of the trauma. The full impact of a single bombing in war times may be mitigated to some extent by previous experiences and general expectation of such events.

Lewis [5] attempted to study the psychological affects of massive air raids, or blitz, in Britain at the beginning of the Second World War. He concludes, "Air raids have not been responsible for any striking increase in neurotic illness"; though he concedes, "after intensive raids, there is a slight rise in the total amount of neurotic illness in the affected area, occurring chiefly in those who have been neurotically ill before". Transient symptoms corresponding to what would now be called Acute Stress Reaction were common. Of specific neurotic reactions, anxiety and depression were frequently reported.

Lifton [6] has provided a graphic description of the after effects of the atomic bomb in Hiroshima. Lewis [5] had also reported that in Bristol, a survey of families taking shelter in tunnels from aerial bombardment found very high proportions suffering from well marked neuroses. Sims *et al.* [6] described severe psychosocial sequelae to the 1974 Birmingham bombing at two years follow-up. The 'aftermath neurosis' consisted of anxiety and phobic symptoms, substance abuse, deterioration in marital and family relationships and poor employment record. Fifty years of research since Lewis's study has resulted in considerable advance in understanding trauma [8], recognition of PTSD [9, 10] and more refined instruments to study the psychosocial consequences [10].

A study of Indochinese refugees attending a psychiatric clinic in Oregon, U.S.A. [12], found that they had been exposed to severe war trauma including bombing, detention and torture. Seventy percent had current PTSD. Women and the elderly were at an increased risk to develop PTSD. Depression was common (81%), while antisocial disorders and alcohol abuse were uncommon. Another similar study also noted higher risk among Cambodian women without their spouses and considerable psychosocial disabilities associated with their trauma [13]. However, most refugees never spontaneously reported psychological symptoms; but rather, complained of somatic problems. It took sensitive interviewing to reveal underlying psychiatric disorders [12].

There has been a chronic war situation, described as a low intensity conflict, in North and East of Sri Lanka since 1983. The present ongoing study attempts to assess the extent of the problem in different categories of civilians. This paper reports on the post-traumatic responses to aerial bombing in a displaced population taking refuge in a school building. However, the problems of the displacement itself and war trauma in the general population will be presented separately [14].

METHOD

Subjects

Since the outbreak of the most recent round of hostilities between the Sri Lankan security forces and the Tamil militant Tiger group in June,1990; approximately one-third of the population in the North and East of Sri Lanka have been displaced due to the conflict spreading to their areas. There is now estimated to be 264,335 displaced persons from 79,834 families in the Jaffna peninsula which has a total population of 600,000 [15]. The entire population living in the area surrounding the Palali airport military base (situated in the northern tip of Sri Lanka) was gradually displaced due to intense fighting there. Similar to other families which had sought shelter in various refugee camps (displaced persons are referred to as refugees locally) in the Jaffna peninsula, a group of 20 families with 101 members moved into the Sri Saratha Mahalir Vidyalam School at Kokuvil in January 1991. The school came under sudden and unexpected bombing from 12 noon on 9 February, 1991. The group was caught unawares for the first bomb, but following this, some took shelter in a bunker, while others fled from the school. Three bombs followed, causing extensive damage to the school buildings. While running, a 16 year old girl was hit by the exploding second bomb, resulting in a traumatic amputation of one leg. The girl, the only casualty, was admitted to the Jaffna General Hospital, while the rest dispersed to find accommodation in other refugee shelters. Ninety-two of these 101 refugees were traced and form our study population.

Measures

The subjects were assessed within 4–9 weeks of the bombing by medical students (who had completed their psychiatry appointment) under the supervision of the consultant. The assessment included general observations, establishment of an ongoing relationship, administering the Stress Impact Questionnaire (SIQ) and a physical and mental state examination. The SIQ is a structured interview schedule designed for those over 15 years, from previous questionnaires used locally [16] and abroad in trauma situations [11]. Diagnostic criteria for Acute Stress Reaction, PTSD, General Anxiety Disorder and Major Depressive Episode [9, 10] from the Diagnostic and Statistical Manual, third revised edition (DSM III-R), and the International Classification of Diseases, tenth revision (ICD-10); as well as Horowitz's [15] Impact of Events Scale (IES), hostility and somatization questionnaire were used to prepare specific items. The SIQ recorded basic demographic data, somatic complaints and psychosocial symptomatology. The symptoms were graded as mild, moderate or severe. A total somatic score for each person was calculated by summing up the severity (absent—0, mild—1, moderate—2, severe—3) of each somatic complaint without organic cause out of 33 specified items. Similarly, a psychosocial score for each person was calculated by summing up the severity of each psychosocial symptom (0–3 as above) out of 40 specified items excluding those due to Acute Stress Reaction. Although the questionnaire covered previous stresses and symptom responses, only the somatic and psychosocial symptoms manifesting after the bombing experience were considered in assessing post-traumatic responses. Where necessary, referral for treatment and rehabilitation measures were undertaken by the medical students. Due to the prevailing disturbed situation, it was not possible to keep track of the families for long term follow-up.

Of the 92 subjects, 55 were above 15 years of age. The SIQ was administered to 43 members. Forty were present in the school building during the bombing, while three were in the neighbourhood. Of the twelve who were not interviewed, one had been away during the bombing and was excluded. One had since moved elsewhere and could not be contacted. Six had left the peninsula to seek livelihood for their families. Four had fled to India by boat.

RESULTS

Basic demography

The age range was 15–66 years and the mean was 31.6 years. Eighty-one percent of the study population was below 45 years with 44% in the 15–24 age group. There were 13 (30%) males and 30 (70%) females. Compared to the Sri Lanka general population (18), the younger age and female sex

(sex ratio is one in the general population) were over represented.

Ninety-five percent of the subjects were below the poverty line. They mainly belonged to the fishing community but had been denied their traditional occupation due to a war time ban an going out to sea. Only 31% had found some form of alternate employment. Twenty-nine percent had suffered from a major medical illness. There was no previous history of mental illness in the subjects or in their near relations.

Acute stress reaction

Immediately following the bombing 32 (74%) experienced various degrees of shock or daze. Associated symptoms found in Acute Stress Reaction (ICD 10) included anxiety (67%), depression (65%), aimless wandering (56%), confused behaviour (40%), withdrawal (35%), anger (30%) and over activity (16%). All were transient reactions, the majority clearing up within a few hours while a minority lasted for a few days. Ten (23%) had patchy loss of memory for the event.

Somatization

Somatic complaints were found in 36 (84%) subjects, of whom 20 had various organic diseases. Only four subjects complained of hearing problems after the bomb blast. Common organic diseases included scabies, anaemia and psychosomatic conditions like peptic ulcer, eczema and bronchial asthma.

Somatization, that is somatic complaints arising after the bombing for which no organic cause could be established, were found in 25 (58%). Common somatic complaints in those without organic disease included backache (26%), headache (26%), palpitation (17%), loss of appetite (17%) and tremor (13%).

Eighteen subjects (42%) had no somatization while eight (19%) had more than 5 complaints. Seventeen (40%) had one to four complaints. The range was 0–12 somatizations with a mean of 3.7 per person. The mean number of somatizations per person by age and sex is given in Table 1. The tendency for somatization increases with age, being most marked in those over 45 years. Males had on the average one more somatic complaint than females, but when the severity is taken into account, the mean somatic score is almost equal.

Table 1. The mean number of non-organic somatic complaints and somatic score by age and sex

Age (years)	Mean number of somatic complaints	Mean somatic score
15–24	2.75	3.83
25–44	4.25	6.30
45–59	11.00	20.00
Sex		
Male	5.14	6.14
Female	4.05	6.17
Total	3.71	6.16

Table 2. Common PTSD and depressive symptoms after the bombing

Symptoms	Number ($n = 43$)
PTSD	
Repeated thoughts of events	20 (47%)
Repeated dreams of event	10 (23%)
Trigger reactions	23 (53%)
Loss of interest	12 (28%)
Detachment	7 (16%)
Loss of emotion	5 (12%)
Startle reactions	15 (35%)
Sleep disturbance	9 (21%)
Loss of memory	10 (23%)
Difficulties in concentrating	13 (30%)
Avoiding similar situation	13 (30%)
Depression	
Sadness	11 (26%)
Crying spells	12 (28%)
Slowing	9 (21%)
Hopelessness	8 (19%)
Pessimism	20 (47%)

Post-traumatic Stress Disorder (PTSD)

Post-traumatic Stress Disorder Meeting the ICD-10 diagnostic guidelines was found in 27 subjects (63%). While 19 (44%) met the stricter DSM III definition, only in seven (10%) had the symptoms been present for at least one month (DSM III–R). The prevalence of the commoner PTSD symptoms are shown in Table 2. The age and sex distribution of the subjects fulfilling different PTSD diagnostic criteria is shown in Table 3. While the occurrence of PTSD in different age groups is similar, it is more common in females.

Anxiety and depression

In relation to anxiety disorders, 25 (58%) had phobic symptoms while panic was reported in 17 (40%). Non-specific anxiety was found in 9 (21%). Thirteen (30%) reported persistent worries and seven (16%) had nightmares. In all, eight (19%) met the DSM III–R definition for Generalized Anxiety Disorder, except for the duration of symptoms, which could only be inquired for up to the time of interview (4–9 weeks). Depressive symptoms were common as shown in Table 2, but only six fulfilled the DSM III-R

Table 3. Age and sex distribution of subjects fulfilling different PTSD diagnostic criteria

	PTSD			No PTSD
	ICD 10	DSM III	DSM III-R	
Age (Years)				
15–24	13	9	4	6
25–44	10	7	1	6
45–59	2	1	1	4
59–	2	2	1	0
Sex				
Male	7	6	1	6
Female	20	13	6	10
Total	27	19	7	16

Table 4. The mean number of psychosocial symptoms and score by age and sex

	Mean psychosocial symptoms	Mean psychosocial score
Age (Years)		
15–24	11.37	16.11
25–44	10.94	15.50
45–59	17.50	23.50
Sex		
Male	11.54	15.08
Female	11.30	16.80
Total	11.37	16.28

definition for Major Depressive Episode with five having severe depression.

Psychosocial problems

Irritability and hostile impulses were found in 18 (42%). Social withdrawal was reported in 24 (32%). Eight (19%) had developed interpersonal relationship problems, while one reported improvement. Functional disability was found in 15 (35%). In one patient functional ability had improved. Changes in religious beliefs were reported in 16 (37%). Of these 6 (14%) had developed an increase and 10 (23%) experienced a decrease in beliefs. Patterns of alcohol and drug abuse, an exclusively male problem, were influenced by other factors such as availability, finance and prior use, and could not be directly correlated with the bombing by the methods used in this study.

The number of psychosocial problems per person occurring after the bombing, inquired for from a maximum of 40 after excluding symptoms of Acute Stress Reaction, ranged from 1 to 31 with a mean of 11.37. Eleven subjects reported > 15 symptoms, 6 had > 10, while 13 had > 5. The mean number of psychosocial symptoms per person by age and sex is shown in Table 4. Calculation of psychosocial score produced a range from 1 to 63, with a mean of 16.28. Psychosocial sequelae is most marked for those over 45 years, while the manifestation in the sexes is almost equal.

Comparison

The association of somatic and psychosocial problems with the different PTSD diagnostic criteria are shown in Table 5. All the somatic and psychosocial problems studied are much more common in those with PTSD than those without. In particular, this difference is very marked for somatization. The correlation between DSM III diagnosis of PTSD and Acute Stress Reaction was high. Ninety percent of those who developed DSM III PTSD had a preceding Acute Stress Reaction.

There is an increasing association of somatization and each psychosocial problem from ICD-10 to DSM diagnosis of PTSD.

DISCUSSION

The assessment of post-traumatic responses to aerial bombing in a displaced population showed, in addition to an immediate Acute Stress Reaction, a large number with PTSD. Symptoms of anxiety and depression, somatisation, hostility, social withdrawal and relationship problems were common. Such selection biases as compensation, asylum issues and help seeking behaviour were avoided by studying all the affected population in the field.

The noticeable predominance of females in the study population needs explanation. Of the 12 subjects who were not interviewed, 9 were males. They had left the Jaffna area to seek a livelihood for their family or as refugees to India. The predominance of females is also a reflection of the situation in the local population (14). There are less males, particularly in the 15–40 age group, due to death, detention, 'disappearance', active participation in the war or migration. The slightly higher or equal somatization in males found in this study could be due to the more disabled males (either organically or those with a tendency to 'sick role' behaviour) staying behind in the camp. A very much higher mean somatization score is found in females in the local civilian population (14). The over representation of the younger age group could be a result of the elderly being left behind during the displacement.

Table 5. The association of somatic and psychosocial problems with different PTSD diagnostic criteria

	PTSD			
Problem	ICD 10 ($n = 27$)	DSM III ($n = 19$)	No PTSD ($n = 16$)	Total cohort ($n = 43$)
Somatic complaints (mean)	4.18	4.98	2.00	3.71
Somatic score (mean)	5.19	6.32	0.94	6.16
Psychosocial symptoms (mean)	15.07	17.84	5.12	11.37
Psychosocial score (mean)	22.19	26.68	6.31	16.28
Acute Stress Reaction	22 (81%)	17 (89%)	10 (62%)	32 (74%)
Anxiety Disorder	8 (26%)	8 (42%)	0 (0%)	8 (17%)
Major depression	6 (22%)	6 (31%)	0 (0%)	6 (14%)
Hostility	15 (56%)	12 (63%)	3 (19%)	18 (42%)
Functional disability	13 (48%)	10 (53%)	2 (13%)	15 (35%)
Relationship problems	8 (30%)	7 (37%)	0 (0%)	8 (19%)

In an attempt to isolate the effects of the bombing from other war trauma, only the symptoms in direct temporal relationship to the traumatic event are reported here. However, due to the chronic war situation, many had experienced similar traumatic events before, not the least being the stress of displacement. In addition, all were exposed to the indirect effects of war like unemployment, poverty and separations. These stresses had by themselves generated considerable psychosocial symptoms, but for the purposes of this report those symptoms that had appeared before the bombing were excluded. Thus the symptoms in those already ill or vulnerable and hence more likely to develop post-traumatic responses were excluded. One way of overcoming this difficulty would have been to include exacerbation of pre-existing symptoms after the most recent traumatic event. A survey in the general population gives the background level of symptoms due to the chronic war situation as a whole [14]. Direct comparison was not possible as only symptoms appearing for a short period after the bombing were considered in this study.

Although 6–8 weeks after the trauma is recommended as the best period to assess the initial response [11], post-traumatic reaction can be delayed, even by six months (Delayed PTSD), and this was missed in this study. A longer follow-up study would have given a more complete picture, but again, reactions to new stresses due to the ongoing war would have been difficult to exclude. This type of continuing stress found in conflict situations has been called chronic traumatic stress [19].

The only casualty in the bombing, a 16 year old girl who suffered a traumatic below knee amputation, showed minimal psychosocial reactions. Initially, she had a severe Acute Stress Reaction that lasted for 1 hour. Subsequently, situations resembling or evoking memories of the event triggered the old emotional reaction to a moderate degree. She also had some pessimism about the future, otherwise there was no adverse effect that could be detected. Marked denial as a strong defense mechanism against what had happened was probable. In contrast, the majority of the uninjured in the school; and three others from the group who were in the neighbourhood at the time of the bombing and had experienced the sound of diving planes, explosion of the bombs, and fear for their relations in the school, showed considerable psychosocial sequelae. The three who were in the neighbourhood during the bombing experienced a mild Acute Stress Reaction. At the time of interview they had PTSD, considerable anxiety and depressive symptoms including two with suicidal ideas, irritability and hostility, interpersonal relationship problems and marked somatization. However, some of these symptoms dated from earlier war related traumatic experiences. The reactions were most marked in a youth of 19 years, who had been shot by the Indian Army in 1987, while one of his brothers was killed and another tortured. His PTSD had been present from this earlier period but underwent a change from a predominantly intrusive phase to a denial, benumbing phase. Horowitz has described these two phases and processing at different levels of aspects of the trauma [1]. In the refugee population multiple trauma experiences appeared to be interwoven in complex ways, the bombing being the latest in the series, causing exacerbation of pre-existing symptoms, modification in some and the development of other new complaints.

The close association of PTSD in general and the DSM III criteria in particular, with somatization and other psychosocial problems is very striking. Although somatization is a relatively non-specific response, being common in other psychiatric disorders like anxiety and depression, its close association with PTSD [17] warrants its inclusion in the PTSD symptomatology. Specially in this and similar cultures, somatization may be an important way PTSD manifests itself [12] or presents to medical care. Evidently, somatization is a socially acceptable way of expressing psychosocial distress.

Interestingly, none of the subjects considered themselves psychiatrically ill, but socioeconomically affected by the war. It may, in part, be due to lack of psychological awareness or denial due to the stigma attached to the psychiatric label in this cultural setting, and the difficulties and priorities of the war situation itself. Thus the variety of symptoms and even the cluster of more severe symptoms amounting to a psychiatric disorder in some individuals had been accepted as an inevitable part of the war situation. It could also be true that many of the responses to a traumatic experience are manifestations of an organism's attempt to cope or adapt in an abnormal situation [20].

Obviously what is abnormal is the bombing itself and not the reactions to it. Lifton [20] had stressed that it is important not to delegitimize the suffering of the victims by assigning a psychiatric label. Bombing of civilians should be considered a grave offence—a war crime. The cardinal symptom of PTSD, where the individual repeatedly re-experiences the originally overwhelming and not immediately assimilitable catastrophe, may be a healthy, normal, psychodynamic mechanism of working through and mastering the trauma in smaller, tolerable doses [1]. Similar to the difference between normal and pathological grief, prolongation of the post-traumatic reaction to over one month may constitute a pathological response (DSM III–R), particularly if associated with other disorders like anxiety, depression, somatization, hostility, functional disability and relationship problems.

Questions have been raised regarding the assessment of trauma, PTSD in particular, in different cultures using western medical models [3, 21]. Most patients do not complain of PTSD symptomatology

[12]. Nevertheless, we do find in the present war situation many individuals presenting for medical treatment with somatization, anxiety or depression to have an underlying PTSD on examination. The root cause of distress and dysfunction would also appear to be the trauma experience, though the patient themselves may not identify the link. This is true in many psychiatric conditions, not only PTSD. We have found classical PTSD symptomatology following a wide variety of traumatic experiences caused by war including torture [16].

One meta criticism of trauma research from a psychiatric point of view is that they tend to ignore the socio-political and economical causes; and, in our case, ethnocentric or nationalistic constructions of reality that gives rise to war [22–24]. On the contrary, identification of PTSD helps the therapist to understand and treat the patient; and at the same time, review of the traumatic experience helps the patient to come to terms with what has happened and accept the 'quite normal' responses [21]. Moreover, PTSD serves as a useful instrument to describe the effects of atrocities perpetuated on civilians. Thus PTSD becomes an internationally recognized means to draw attention to the plight of civilians, and in the long term to create social awareness and mobilize support for affected populations. Yet, social justice for the victims of war may continue to be an elusive dream.

The local social construction of meaning for the bombing did not give it a catastrophic dimension as such events were day to day occurrences and considered part and parcel of the war. Except helping to transport the injured girl to hospital, the subjects were left to fend for themselves after the bombing. Social support was not forthcoming in many respects. Their immediate collective needs were for safety and shelter. As a group they fled from the school but broke up into smaller units to find alternate accommodation elsewhere in the peninsula; for example, abandoned houses. Ironically the owners of these houses with better resources and connections in Colombo or abroad had already left the area. The progressive war had concentrated the poorest sections into a smaller and smaller area within the peninsula.

The only alternative was to flee to India, and this some did. The bombing was the last straw in a series of events that finally compelled them to escape clandestinely. For some from the same community the breaking point had come earlier when they had sought asylum in India.

With the current shift of emphasis in research from individual to collective trauma, social meaning, and rehabilitation of the community [3, 24–28], it would be instructive to describe observations from this study as a whole and what was done within the limited resources available. The sequence of displacements had the effect of gradually breaking up the village community, the extended family and finally even the nuclear family. Thus they progressively lost the family, village and religious support systems. Many refugees report dreams of their lives before they had been displaced or once again being back home involved in their old regular life, showing intense yearning to return. Slowly they had been deprived of many traditional ways of coping with stress. For males, even alcohol had become unavailable. The cumulative effects of chronic stress and lack of opportunities for adaptive changes appeared to be the cause of passivity, a resignation to fate, and dependency in this and other refugee populations. Indeed such bombings, shellings and other attacks without obvious military targets, appeared rather to be aimed at breaking the spirit of the local population.

One major stress identified in the study was separations, for example lack of information about elderly relations who had been left behind in their homes, now under army control. Efforts were made to trace the relations through the International Committee of the Red Cross (ICRC) which led eventually to their reunion. Another common difficulty was lack of schools for the children. Forty percent of school age children had been refused admission or could not attend school as they lacked uniforms, exercise books and other stationeries. As part of the rehabilitation measures, medical students contacted school principals near their residence to secure admission and collected used uniforms and material from the community for them. Subsequently, nutritional programmes, play activity and drawing were used for refugee and traumatized children.

Unemployment and poverty were pressing problems. Due to the war, their traditional occupation, fishing in the sea, had been prohibited. In addition, all their equipment had also been lost. Non Governmental Organizations (NGO's) were approached for economic and material help. Income generating projects, particularly for women, through occupational training (e.g. tailoring) were begun. Resettlement and construction of huts are important post-traumatic rehabilitation measures that were not available at the time of study.

Individual counselling was used when necessary, indeed the SIQ was designed to encourage ventilation and interviewers were trained to provide support and counselling. Traditional relaxation methods like yoga were also introduced for conditions like somatization and anxiety. Overall, the collective methods described above were found to be much more acceptable and practical in creating hope, restoring self-esteem and motivation to rebuild their shattered lives.

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