Psychological effects of the Nairobi US embassy bomb blast on pregnant women and their children

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A descriptive study was carried out in pregnant women who were affected by the 1998 bomb blast in Nairobi, Kenya, and their babies who were in utero at the time of the blast. The psychological effects of the event on the exposed women were severe. After three years, the average score on the Impact of Event Scale - Revised was still higher than 29 for the three subscales combined, suggesting that most of the study group was still suffering from clinical post-traumatic stress disorder (PTSD). The scores on all Childhood Personality Scale (CPS) subscales were significantly higher in children of the study group than in controls. The mothers' PTSD symptom levels at one month after the blast correlated with the children's CPS profiles.

Key words: Pregnant women, psychological stress, children's behavioural abnormalities

There is evidence for an association between anxiety and psychological stress in pregnant women and childhood maladaptation in their offsprings who were in utero at the time of the anxiety/stress (1-3). Moreover, delinquent populations have been shown to have a higher prevalence rate of histories of pre-natal problems and stress than non-delinquent populations (4). We hypothesized that Kenyan pregnant mothers who suffer from acute stress disorder (ASD) and post-traumatic stress disorder (PTSD) are more likely to give birth to children (in utero at the time of the ASD/PTSD) with maladaptive behaviour and psychological problems.

We carried out a descriptive study in pregnant women who were affected by the bomb blast occurring in Nairobi, Kenya on August 7, 1998 and their babies who were in utero at the time of the blast. This was a disastrous event in which 213 people died and 5,000 sustained injuries taking them to hospitals around the city (5).

The time and location of the bomb blast, affecting a cosmopolitan population, and the ample number of pregnant mothers involved, makes the study population a representative sample.

METHODS

Thirty-seven expectant mothers who survived the bomb blast were enlisted for the study after obtaining their informed consent. Forty-one women with a similar socio-economic background, who had no history of trauma during pregnancy and had a child within the same age range (23-38 months) as the study group, were randomly selected as the control sample, after providing informed consent.

In addition to the medical records and a socio-demographic questionnaire, the Impact of Event Scale – Revised (IES-R) (6) and the Childhood Personality Scale (CPS) (7) were administered. The latter scale consists of 48 items covering a broad category of children's behaviours, half of which are viewed as socially desirable (normal) and the other half as abnormal. For all items, high scores indicate a child's deviation from normal. The items are further clustered into subscales: socialization, depression, hyperactivity, creativity, attention span.

During focus group and peer counselling sessions, mothers were given the opportunity to freely express their experiences and feelings in relation to the impact of the blast on their lives. Comments and observations shared were recorded.

The data were analysed using the statistical package for social scientists (SPSS version 10.0). Student's t-test and chi-square were used, as indicated, to compare variables between the two samples, and Pearson's correlation coefficient was used to test correlations between variables. Due to the small sample size, confidence interval level was set at 90%.

Clearance for the study was obtained from the Kenyan Government.

RESULTS

All the mothers were of African origin; the majority (92%) were Kenyan. The traumatised mothers' ages ranged between 24 and 41 years, with a mean of 32 years;

Table 1 Scores on the subscales of the Impact of Event Scale – Revised in traumatized women (n=37) one month and three years after the bombing

	One month after		Three years after		t	p
	Mean ± SD	*Range*	*Mean ± SD*	*Range*		
Re-experiencing	19.5 ± 6.0	3-28	16.1 ± 7.0	0-28	2.36	0.02
Hyperarousal	26.9 ± 8.9	7-40	21.4 ± 10.9	0-39	2.54	0.01
Avoidance	51.4 ± 22.0	7-91	44.1 ± 25.0	2-92	1.93	0.06

Table 2. Scores on the subscales of the Childhood Personality Scale in children of traumatized women and controls

	Study group (n=37)	Control group (n=41)	t	p
Normal behaviour				
mean±SD (range)	78.6±33.3	29.5±13.7	7.51	0.001
(maximum score = 144)	(7-124)	(5-62)		
Behaviourally disturbed				
mean±SD (range)	71.9±16.7	57.0±21.6	2.88	0.007
(maximum score = 144)	(37-97)	(10-94)		
Depression				
mean±SD (range)	30.9±11.9	23.4±11.2	2.61	0.01
(maximum score = 78)	(4-49)	(1-45)		
Socialization				
mean±SD (range)	54.8±23.9	18.8±23.9	7.76	0.001
(maximum score = 102)	(0-90)	(3-45)		
Hyperactivity				
mean±SD (range)	37.6±8.8	30.0±11.6	2.75	0.009
(maximum score = 60)	(16-54)	(9-59)		
Creativity				
mean±SD (range)	13.2±7.5	5.6±4.4	4.88	0.001
(maximum score = 24)	(0-24)	(0-18)		
Attention span				
mean±SD (range)	14.2±4.9	8.6±3.8	5.46	0.001
(maximum score = 24)	(0-23)	(1-15)		

the non-traumatised mothers' age range and mean were 21-39 and 28.7 years respectively (p=0.083). The two samples did not differ with respect to educational level (p=0.413) or number of children (p=0.891). Traumatized women were more likely to be formally employed (78.4% vs. 26.8%, p=0.002).

Of the traumatized women, 86.5% were within 100 metres from the epicentre of the bomb blast and the rest within 200 to 400 metres. Due to the effects of exposure to the bomb, 89.2% of the mothers were not able to work (the duration of absence from work ranged from one month to three years). According to their perception, 54.1% of the traumatized women lost consciousness, whereas 32.4% did not lose consciousness and the remaining could not remember. Seven mothers lost close relatives in the disaster, including one who lost her spouse; the other 30 lost at least one close friend.

Thirty-two traumatized women received counselling (three immediately after the bombing; four during the first month and twenty-four after the first month). Counselling was perceived as very helpful by 55% of the women, and as helpful by a further 32%.

Table 1 shows the mean scores on the IES-R dimensions of re-experiencing, hyperarousal and avoidance at one month and three years after the bomb blast. A total average score of more than 29 for the three subscales combined, which is indicative of clinical PTSD (8), was found at both times.

The age of children in the study group at the time of the interview ranged from 23 to 38 months, with a mean of 34, while that in the control group ranged from 29 to 40 months, with a mean of 35. The study group consisted of 54.1% males and 45.9% females, while the control had 41.5% males and 58.5% females. The two groups did not

Table 3. Correlations between traumatized women's scores on the Impact of Event Scale – Revised and their children's scores on the Childhood Personality Scale (p values are shown)

	Normal	Disturbed	Depression	Socialization	Hyperactivity	Creativity	Attention span
Exposure	.694	.032*	.090*	.907	.127	.573	.382
Safety index	.035*	.335	.036*	.011*	.127	.504	.428
Initial response	.544	.450	.836	.658	.075*	.651	.184
Re-experiencing 1	.027*	.702	.495	.018*	.746	.116	.249
Re-experiencing 2	.368	.417	.305	.395	.975	.179	.912
Hyperarousal 1	.012*	.854	.646	.014*	.322	.049*	.061*
Hyperarousal 2	.347	.241	.234	.387	.665	.210	.590
Avoidance 1	.074*	.727	.642	.048*	.233	.466	.258
Avoidance 2	.543	.154	.222	.586	.431	.223	.968

1 - One month after the blast
2 - Three years after the blast
* p<0.01

differ significantly with respect to place of birth, mode of delivery and Apgar score, but were statistically different in gestation period at birth (9 months: 70.3% in the study group, 90.2% in the control group; eight months: 5.4% vs. 7.3%; 7 months: 24.3% vs. 2.4%, p=0.0001). In the children of the study group, the gestation age at the time of the blast was as follows: first trimester 16.2%, second trimester 37.8%, third trimester 45.9%.

The CPS profile for both groups is summarised in Table 2. The mean score was significantly higher in the study group on all subscales.

Table 3 summarises the correlations between the mothers' IES-R scores and the children's scores on the CPS subscales. Overall, it can be seen that the mothers' experiences at the time of the bomb blast and one month after the incident had some significant correlations with children's behaviour, whereas mothers' emotional state three years after had none.

DISCUSSION

This was a descriptive study carried out in a relatively small sample. To our knowledge, there are no other studies conducted under similar circumstances that can be used for comparison.

The social and demographic characteristics of mothers in the study and control groups reflect those of the general Kenyan population. The two groups were similar on all socio-demographic characteristics, except occupation. The differences in occupation could be explained by the proximity of the business district to the epicentre of the bomb blast.

The psychological effects of the disastrous event on exposed women, as assessed by the IES-R, were severe. There were significant improvements after three years in hyperarousal and re-experiencing subscales, but the average score on IES-R was still higher than 29 for the three subscales combined, suggesting that most of the study group was still suffering from clinical PTSD, although they reported they had found counselling helpful.

The scores on all CPS subscales were significantly higher in children of the study group than in controls. These findings confirm the presenting complaints by mothers of the study group as to why these children seemed to be different from other children, an observation for which the mother had no explanation. The mothers' PTSD symptom levels at one month after the blast correlated with the children's behavioural abnormalities. However, PTSD scores three years after the blast had no correlation with the children's CPS profiles.

Despite the perceived benefits of interventions put in place after the bomb blast, limited effects on the intensity of PTSD were demonstrated in exposed mothers three years after the event, which emphasizes the need to evaluate psychological interventions for trauma victims with a view to making them more effective and culturally appropriate.

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