Key messages

- Infectious syphilis and other forms of congenitally transmissible syphilis continue to be found among pregnant women in the United Kingdom
- New cases of infectious syphilis are being detected through antenatal screening
- Risk factors for infectious syphilis in pregnant women comprise living in London and the south east, belonging to an ethnic minority group, and having been born abroad
- A substantial minority of mothers with congenitally transmissible syphilis also occur among white women born in the United Kingdom
- Abandonment of universal screening for syphilis would probably result in stillbirths and cases of congenital syphilis

Lawrence (Chelsea and Westminster Hospital) were the syphilis specialists who reviewed the cases, and we thank them for their speedy turn round of case reports. We acknowledge the diligence of individual specialists in genitourinary medicine and paediatricians in returning cards and data.

Contributors: A-KH undertook the analysis of the data and drafted the paper. AN designed and oversaw the running of the surveys and completed the paper. CC led and coordinated the British Cooperative Clinical Group survey and contributed to the writing of the paper, as did TL, who was the lead clinician for the survey of paediatricians. NC contributed to writing the paper and applying the findings to syphilis screening policy. JW and LR administered the two surveys. AN is the guarantor.

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1 Schwartz DA, Larsen SA, Beck-Sague C, Fear M, Rice RJ. Pathology of the umbilical cord in congenital syphilis analysis of 25 specimens using histochemistry and immunofluorescent antibody to Treponema pallidum. *Hum Pathol* 1995;26:784-91.
2 STD Section, HIV and STD Division, PHLS Communicable Disease Surveillance Centre, with the PHLS Syphilis Working Group. *Report to the National Screening Committee. Antenatal syphilis screening in the UK—a systematic review and national options appraisal with recommendations*. London: Public Health Laboratory Service, 1998.
3 Centers for Disease Control and Prevention. 1998 Guidelines for treatment of sexually transmitted diseases. *MMWR* 1998;47. (Recommendation and reports (RR-1).)
4 Nicoll A, Moisley C. Antenatal screening for syphilis. *BMJ* 1994;308:1253-4.
5 Communicable Disease Surveillance Centre. Sexually transmitted diseases quarterly report: syphilis in England and Wales. *CDR Weekly* 1997;7:192-4.
6 Calman K. Developing screening in the NHS. *J Med Screening* 1994;1: 101-5.
7 Centers for Disease Control and Prevention. Case definitions for infectious conditions under public health surveillance. *MMWR* 1997;46. (Recommendation and reports (RR-10).)
8 Anonymous. Syphilis in Bristol 1997-8: an update. *CDR Weekly* 1998;8:413, 416.

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Prospective study of post-traumatic stress disorder in children involved in road traffic accidents

Paul Stallard, Richard Velleman, Sarah Baldwin

Abstract

Objective To determine the prevalence of severe psychological trauma—that is, post-traumatic stress disorder—in children involved in everyday road traffic accidents.

Design 12 month prospective study.

Setting Accident and emergency department, Royal United Hospital, Bath.

Subjects 119 children aged 5-18 years involved in road traffic accidents and 66 children who sustained sports injuries.

Main outcome measure Presence of appreciable psychological distress; fulfilment of diagnostic criteria for post-traumatic stress disorder.

Results Post-traumatic stress disorder was found in 41 (34.5%) children involved in road traffic accidents but only two (3.0%) who sustained sports injuries. The presence of post-traumatic stress disorder was not related to the type of accident, age of the child, or the nature of injuries but was significantly associated with sex, previous experience of trauma, and subjective appraisal of threat to life. None of the children had received any psychological help at the time of assessment.

Conclusions One in three children involved in road traffic accidents was found to suffer from post-traumatic stress disorder when they were assessed 6 weeks after their accident. The psychological needs of such children after such accidents remain largely unrecognised.

Department of Child and Family Psychiatry, Bath Mental Health Care Trust, Royal United Hospital, Bath BA1 3NG

Paul Stallard, *clinical psychologist*

Richard Velleman, *director of research and development*

Sarah Baldwin, *research assistant*

Correspondence to: Dr Stallard stallard_p@bath-mhct.swest.nhs.uk

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Introduction

Accidents in children are common and in 1996 in the United Kingdom accounted for about two million presentations at accident and emergency departments.[1] Parental reports indicate that most children display emotional distress immediately after an accident, although for most this distress is short lived and comparatively mild. Questionnaires completed by children indicate that some experience higher levels of emotional distress, particularly those involved in road traffic accidents or who have fallen from heights. This distress can persist for several months, although the emotional needs of these children are rarely recognised and seldom receive any ongoing planned intervention.[1]

In 1997 the number of road traffic accidents involving young people under the age of 19 years

totalled 72 154.[2] Fatalities and serious injuries accounted for almost 16%, with most suffering physical injuries of mild to moderate severity. Research focusing on adult survivors of road traffic accidents has consistently shown high rates of psychological morbidity, particularly mood disorders, travel anxiety, depression, and post-traumatic stress disorder.[3–5] Although there has been little systematic research into the psychological effects of road traffic accidents on children, there is increasing recognition that they too will be affected.[6 7]

Individual case studies detailing the effects of road traffic accidents on children have been described.[7 8] Similarly, reports from major traffic accidents indicate that children display considerable psychological reactions and in many cases present with a range of symptoms characteristic of post-traumatic stress disorder.[9 10] The diagnostic criteria of this disorder involve the experiencing of a traumatic event that is outside the range of usual human experience. This event results in persistent re-experiencing of the trauma, avoidance of stimuli associated with it, and increased rates of arousal. These symptoms have to persist for longer than 1 month and cause clinically measurable distress or impairment in social, occupational, or other areas of functioning (*Diagnostic and Statistical Manual of Mental Disorders*, 4th edition (DSM-IV)).[11] For young people symptoms may include sleep disturbance and nightmares, separation anxiety, difficulties in concentration, intrusive thoughts, difficulties in talking with parents and friends, mood disturbance, deterioration in academic performance, specific fears, and accident related play.[12]

Much of the research into the effects of traffic accidents on children has been retrospective. It has either described specific individual cases or focused on major accidents involving groups of children.[8 13] Individual clinical assessment of the children has not always been undertaken, with studies relying extensively on scores from self administered questionnaires to detect the possibility of post-traumatic stress disorder.[9 10 14] The time at which the assessment was undertaken has varied, and the effects of everyday individual traffic accidents have rarely been systematically assessed.[14 15] We determined the prevalence of post-traumatic stress disorder by individual clinical assessment of children involved in everyday traffic accidents.

Methods

Study cohort

The study was prospective and ran for 12 months from March 1996 to February 1997. The experimental group consisted of children and young people aged 5-18 years who attended the accident and emergency department at the Royal United Hospital, Bath, after a road traffic accident. To control for the possible effects of hospital attendance on psychological distress[16] we recruited a control group of children who experienced unexpected trauma after a sports injury.

Identification of children

The subjects were identified each week from the records in the department. Standard information was collected, including basic demographic details, whether the child was admitted, a proxy measure of severity of injury determined by the Manchester triage priority scale,[17] number of *x* rays pictures taken, and whether any fractures or blows to the head were identified. The Manchester triage scale is a standardised 5 point priority system designed to ensure that patients are seen in order of clinical need rather than attendance. A rating of 1 indicates that immediate attention is required, a rating of 2 that attention should be given within 10 minutes, while 5 suggests a non-urgent case requiring attention within 4 hours.

Project recruitment

Two weeks after the accident the child and his or her parents were sent an information sheet about the project accompanied by an introductory letter explaining that a researcher would shortly contact them. One week later the family was telephoned, invited to participate in the study, and, if they agreed, a date arranged for the interview.

Assessment

To ensure that children had an opportunity to express openly their own account of the accident they were interviewed when possible without their parents present. Most interviews were conducted alone with the child (68.9%) in his or her own home (86.6%). For younger children this was not appropriate and if a parent was present care was taken to direct all questions towards the child and to minimise parental involvement and question answering.

Semistructured interview

A semistructured interview was developed which incorporated the clinician administered post-traumatic stress disorder scale for children (CAPS-C).[18] This scale systematically assesses each of the diagnostic criteria for post-traumatic stress disorder as detailed by DSM-IV.[11] Fulfilment of the criteria requires the presentation of specific symptoms indicating that the traumatic event is regularly re-experienced, that trauma related stimuli are avoided, and that the individual has experienced a measurable increase in arousal. The resulting disturbance has to cause clinically measurable distress or impairment in social or other areas of functioning and persist for longer than 1 month.

The semistructured interview started by inviting the child to describe in detail the accident, both the actual events and the emotions and thoughts they experienced before, during, and immediately after the accident. The interview then explored whether the child had any regular or persistent thoughts and memories about the accident which interfered with ability to concentrate—for instance, intrusive thoughts or flashbacks. A range of emotional changes were assessed, including the presence of severe anxiety, sleeping and eating disturbance, and relevant alterations in mood state such as extreme unhappiness or depression, irritability, and anger. The effect of the accident on the child's everyday life was discussed and any avoidance, extreme panic, or hypervigilance noted. Any changes after the accident in the child's social life, school work, friendships, and relationships with family members were assessed. Finally, the way in which the child coped with the psychological consequences arising from the accident were identified.

The interview format was revised and restructured during the pilot study, during which 19 children who had been involved in road traffic accidents were assessed. Data from these children were not included in the final analysis. Reliability between assessors of the interview was determined by randomly selecting eight interviews, which were rated blind by a second researcher. Agreement between the two raters on their coding of responses to the 101 questions that formed the semistructured interview was 93.1%. There was total agreement between the two raters as to which of the diagnostic criteria for post-traumatic stress disorder each of the eight children fulfilled.

Psychometric assessment

The children completed a battery of psychometric assessments that assessed the effect of the trauma (impact of events scale[19]), the presence of depression (Birleson depression inventory[20]), and anxiety (revised manifest anxiety scale[21]). The Birleson depression scale has not been validated on younger children and because of uncertainty regarding the appropriateness of some items it was decided to administer the psychometric assessments only to children over the age of 7.

Researchers

Interviews were conducted by one of four researchers. To standardise the assessment process the researchers worked with each other and conducted a number of joint interviews.

Statistical methods

Categorical data were analysed with non-parametric χ^2 statistics and continuous data by two tailed *t* tests.

Results

Road traffic accident group

A total of 278 children attended the department after involvement in road traffic accidents. One child died, one was in a coma, and one was untraceable at the time of follow up, leaving a study group of 275 children. Of these, 147 refused to be interviewed, although 29 agreed to complete and returned the battery of psychometric assessments. Of the 128 who agreed to participate, 119 were successful interviewed with the nine remaining being out at the agreed appointment time, and further attempts to interview them proved unsuccessful. Therefore 43% of all children involved in road traffic accidents were interviewed between 22 and 79 days after their accident (mean (SD) 40.3 (9.82) days). The diagnosis of post-traumatic stress disorder requires symptoms to persist for longer than 1 month, and three children were interviewed before this time. Data from these children were included in the analysis, although none fulfilled the other diagnostic criteria for the diagnosis for post-traumatic stress disorder. A comparison of children who were interviewed with those who were not is provided in table 1. There were few significant differences between the groups. Interviewees were more likely to require treatment within 10 minutes and to be admitted.

Scores on the psychometric screening battery of those young people aged between 7 and 18 years of age who were not interviewed but returned questions (n = 29) were compared with those within this age range who were interviewed (n = 109). The results summarised in table 2 found no significant differences between the groups on any measure.

Table 1 Children involved in road traffic accidents: comparison between interviewees and non-interviewees. Values are numbers (percentages) of subjects unless stated otherwise

Detail	Interviewed (n=119)	Not interviewed (n=157)	P value
Mean (SD) age (years)	13.97 (3.59)	14.71 (3.32)	0.075
No of boys	68 (57)	102 (65)	0.186
Type of accident:			
Pedestrian	28 (24)	34 (22)	
In car that crashed	67 (56)	95 (61)	
On cycle/motorcycle that crashed	24 (20)	28 (18)	0.078
Mean (SD) triage rating	2.67 (0.98)	3.08 (0.79)	0.001
Priority rating 1 or 2 (treatment within 10 minutes)	38 (32)	30 (19)	0.016
Mean (SD) No of *x* ray pictures	1.27 (1.32)	1.0 (1.41)	0.119
Fractured bones	24 (20)	23 (15)	0.246
Blow to head recorded	56 (47)	66 (42)	0.478
Admitted to hospital	31 (26)	22 (14)	0.014

Table 2 Comparison of mean (SD) scores on psychometric battery between interviewees and non-interviewees aged 7-18 years

Assessment measure	Interviewed (n=109)	Not interviewed (n=29)	P value
Impact of events scale:			
Total score	24.07 (17.28)	23.34 (12.37)	0.832
Intrusion scale	11.26 (9.70)	11.38 (8.30)	0.951
Avoidance scale	12.83 (9.70)	11.97 (6.91)	0.655
Birleson depression inventory	8.72 (5.85)	9.17 (7.05)	0.727
Manifest anxiety scale	10.25 (7.53)	9.66 (6.10)	0.697

The prevalence of post-traumatic stress disorder (that is, the proportion of children in the sample with post-traumatic stress disorder) was 41/119 (34.5%; 95% confidence interval 25.91% to 42.99%). In effect this gives a prevalence of 34% (26% to 43%) for post-traumatic stress disorder in survivors of road traffic accidents. A comparison of those children who experienced post-traumatic stress disorder and those who did not is presented in table 3. Children who had experienced a previous trauma or who perceived their accident as life threatening were more likely to present with post-traumatic stress disorder. Sex was also important with a 19% risk of post-traumatic stress disorder in boys and 55% in girls, giving a relative risk of 2.89. The odds ratio of the disorder in girls relative to boys was 5.15 (2.27 to 11.67).

Control group with sports injuries

A control group of children who attended the accident and emergency department after sporting accidents was recruited during the latter part of the 12 month study period. The process of identification, recruitment, and assessment was the same as that used with the road traffic group, with interviews being conducted between 21 and 82 days after the accident (mean (SD) 43.5 (9.57) days). Data from two children who were interviewed within 1 month of their accident were included, although neither fulfilled the other diagnostic criteria for post-traumatic stress disorder.

A preliminary analysis of the road traffic accident data after 6 months suggested that sex and age may be associated with the presence of post-traumatic stress disorder. A prior sample size calculation indicated that a subject cohort of 57 would give sufficient power for

Table 3 Comparison of road traffic survivors with and without post-traumatic stress disorder (PSTD).Values are numbers (percentages) of subjects unless stated otherwise

Detail	PTSD (n=41)	No PTSD (n=78)	P value
Mean (SD) age at accident	13.56 (3.65)	14.18 (3.57)	0.375
Age (years):			
5-9	8 (20)	10 (13)	0.579
10-14	13 (32)	24 (31)	
15-18	20 (49)	44 (56)	
Boys	13 (32)	55 (71)	<0.001
Type of accident:			
Pedestrian	10 (24)	18 (23)	0.545
In car that crashed	25 (61)	42 (54)	
On cycle/motorcycle that crashed	6 (15)	18 (23)	
Others injured:			
Yes	29 (71)	51 (65)	0.687
No	12 (29)	25 (32)	
Appraisal of life threat:			
Thought would die	21 (51)	14 (18)	<0.001
Previous experience of trauma in past 12 months	16 (39)	13 (17)	0.01
Mean (SD) triage rating	2.41 (0.91)	2.79 (0.99)	0.067
Priority rating 1or 2 (treatment within 10 minutes)	16 (39)	22 (28)	0.100
Mean (SD) No of *x* ray pictures	1.54 (1.33)	1.12 (1.30)	0.114
Fractured bones	9 (22)	15 (19)	0.727
Blow to head recorded	17 (42)	39 (50)	0.341
Admitted to hospital	11 (27)	20 (26)	0.920

Table 4 Comparison between children involved in road traffic accidents and sporting accidents. Values are numbers (percentages) of subjects unless stated otherwise

Detail	Traffic accidents (n=119)	Sporting accidents (n=66)	P value
Mean (SD) age of child (years)	13.97 (3.59)	12.94 (3.86)	0.074
Age (years):			
5-9	18 (15)	8 (12)	
10-14	37 (31)	23 (35)	
15-18	64 (54)	35 (53)	0.794
Boys	68 (57)	37 (56)	0.887
Mean (SD) triage rating	2.67 (0.98)	3.67 (0.63)	<0.001
Priority rating 1 or 2 (treatment within 10 minutes)	38 (32)	4 (6)	<0.001
Mean (SD) No of *x* ray pictures	1.27 (1.32)	0.88 (1.10)	0.056
Fractured bones	24 (20)	20 (30)	0.088
Blow to head recorded	56 (47)	14 (21)	0.001
Admitted to hospital	31 (26)	9 (14)	0.080

statistical analysis. The control group were selected on the basis of age and sex to reflect the composition of the road traffic accident group. A total of 166 children were invited to participate in the project of which 66 (39.8%) were successfully interviewed. The children were participating in various sports including horse riding, cycling, roller skating, football, rugby, and cricket. A comparison between the two groups is presented in table 4.

Children with sports injury had lower average triage ratings, with fewer requiring treatment within 10 minutes. In terms of injuries they received fewer blows to their heads, although there was no significant difference in the number of *x* ray pictures, fractures, or admission rates. Only two (3%) of these children, however, fulfilled the diagnostic criteria for post-traumatic stress disorder. Of these, one child was injured during motocross and the other while horse riding.

Discussion

Representativeness of interviewed sample

Although only 42.8% of the children involved in road traffic accidents were successfully interviewed, there were few significant differences between those who were or were not interviewed. Their demographic details, type of accident, and nature and severity of physical injuries were similar. Although those interviewed had more urgent triage priority ratings and were more likely to be admitted, our subsequent analysis found that these factors were not associated with the development of post-traumatic stress disorder.

The psychometric assessments provided another opportunity to assess whether the group not interviewed displayed more or less psychological disturbance. The profiles of the children on these assessments were similar, and there were no significant differences between the groups on either measure.

On the basis of the variables assessed in this study there seems to be no reason to suggest that the interviewed group was biased and that the prevalence of post-traumatic stress disorder in the group who were not interviewed would be different.

Prevalence of post-traumatic stress disorder

In terms of overall prevalence about one third (35%) of the children interviewed who were involved in road traffic accidents fulfilled the diagnostic criteria for post-traumatic stress disorder. Our data do not indicate any reason to suggest that the prevalence of the disorder in those not interviewed would be different. If it was conservatively assumed that none of the children who refused to be interviewed were suffering from the disorder, however, then at a minimum the prevalence of post-traumatic stress disorder would be 15% (41/278).

Factors associated with development of post-traumatic stress disorder

There were significant sex differences, with girls being more at risk of developing the disorder than boys. These findings are consistent with the literature on childhood trauma.[22] Neither the type of incident nor nature and severity of physical injuries were related to the degree of psychological distress. A number of children with the disorder were involved in comparatively minor accidents, suggesting that this condition is not confined to major incidents or disasters. The personal meaning of the event for the child was, however, important, and previous experience of trauma and appraisal of threat to life were significantly related to the development of post-traumatic stress disorder. This is consistent with other research which highlights the central role of psychological factors in the development of post-traumatic stress disorder.[22]

Psychological problems in children suffering sports injuries

Road traffic accidents resulted in greater psychological distress than unexpected traumas such as sports injuries. Of children involved in traffic accidents, 35% suffered severe psychological effects compared with 3% of those who suffered sports injury. This would confirm the results of previous studies that road traffic accidents generate more severe and prolonged emotional distress than other types of accidents.[1]

Conclusions

Post-traumatic stress disorder is a controversial diagnosis, and some researchers have argued that the

reactions of children to traumatic events are temporary and comparatively minor.[23] The basis for this argument has been contested, and there is now increasing evidence that children are considerably affected in a similar way to adults.[24] Post-traumatic stress disorder refers only to a defined set of symptoms, however, and does not encompass other important although less severe trauma reactions or other disorders associated with traumatic events, particularly anxiety and depressive disorders. The results reported here are therefore limited but nevertheless show that significant psychological distress about 6 weeks after everyday road traffic accidents is comparatively common.

We believe that the results of this study are applicable to all child survivors of road traffic accidents, which would imply that of the 60 000 children under the age of 19 who suffered mild to moderate injuries in 1997, over 20 000 (around 35%) would experience post-traumatic stress disorder. Adoption of a more conservative criteria would still suggest that almost 9000 (about 15%) children each year would suffer post-traumatic stress disorder 6 weeks after their accident and that these symptoms are sufficiently severe to interfere with the child's everyday functioning. Unfortunately the children in this study were not followed up over time, although other research would indicate that by 3-4 months about half would improve without any specialist intervention.[15] Further research is required to determine the long term psychological effects of road traffic accidents and to identify ways in which those children with chronic symptoms can be correctly identified at an early stage and provided with effective psychological interventions.

Despite the frequency and potential severity of the psychological consequences of road traffic accidents these incidents are not generally considered to be major traumas. One off disasters affecting groups of children attract far greater professional attention and support even though the number of children involved is comparatively low. Psychological services for children involved in road traffic accidents are not at present provided in a comprehensive or routine way and often arise as a result of personal injury and compensation claims. Indeed, none of the children experiencing post-traumatic stress disorder in our study had received any professional help at the time of assessment. At the end of each interview the family were given an information leaflet outlining the possible effects of post-traumatic stress disorder and a telephone number to contact if they wanted help, yet only two families contacted the psychologist. Whether this was because professional help was perceived as unnecessary or whether parents and young people failed to acknowledge the severity of their distress remains unknown. Whatever the reason, the psychological needs of most children involved in road traffic accidents remain largely unrecognised.

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Contributors: PS had the original idea for the study, designed the assessment protocol, managed the project, analysed the data, and wrote the paper. RV contributed to the project development and management, advised about data analysis, and edited the paper. SB coordinated the data collection and coding and with Phillipa MacArthur, Julie Langsford, and Lucy Hudson undertook the assessment interviews.

Key messages

- One in three children involved in everyday road traffic accidents was found to suffer from post-traumatic stress disorder
- Post-traumatic stress disorder was experienced by children of all ages, although girls were most likely to be affected
- Neither the type of accident nor the nature and severity of the physical injuries were related to the presence of post-traumatic stress disorder
- The child's personal appraisal of the accident was important, with those children perceiving the event as life threatening being more likely to develop post-traumatic stress disorder
- The psychological needs of children involved in road traffic accidents largely remain unrecognised

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1 Child Accident Prevention Trust. *Healing the hidden hurt: the emotional effects of children's accidents*. London: Child Accident Prevention Trust, 1996.
2 Department of the Environment, Transport and the Regions. *Road accidents Great Britain*. London: Stationery Office, 1997.
3 Mayou R, Bryant B, Duthie R. Psychiatric consequences of road traffic accidents. *BMJ* 1993;307:647-51.
4 Blanchard EB, Hickling EJ, Vollmer AJ, Loos WR, Buckley TC, Jaccard J. Short term follow up of post traumatic stress symptoms in motor accident vehicles. *Behav Res Ther* 1995;33:369-77.
5 Blanchard EB, Hickling EJ, Taylor AE, Loos WR, Gerardi RJ. Psychological morbidity associated with motor vehicle accidents. *Behav Res Ther* 1994; 32:283-90.
6 Di Gallo A, Parry-Jones WLI. Psychological sequelae of road traffic accidents: an inadequately addressed problem. *Br J Psychiatry* 1996;169:405-7.
7 Thompson A, McArdle P, Dunne F. Psychiatric consequences of road traffic accidents. Children may be seriously affected. *BMJ* 1993;307: 1282-3.
8 Jones RW, Peterson LW. Post traumatic stress disorder in a child following an automobile accident. *J Fam Pract* 1993;36:223-5.
9 Stallard P, Law F. Screening and psychological debriefing of adolescent survivors of life-threatening events. *Br J Psychiatry* 1993;163:660-5.
10 Casswell G. Learning from the aftermath: the response of mental health workers to a school-bus crash. *Clin Child Psychol Psychiatry* 1997;2;4:517-23.
11 American Psychiatric Association. *Diagnostic and statistical manual of mental disorders*. 4th ed. Washington DC: American Psychiatric Association, 1994.
12 Yule W. The effects of disasters on children. *Assoc Child Psychol Psychiatry Newsletter* 1989;11:3-6.
13 Curle CE, Williams C. Post-traumatic stress reactions in children: gender differences in the incidence of trauma reactions at two years and examination of factors influencing adjustment. *Br J Clin Psychol* 1996;35:297-309.
14 Canterbury R, Yule W. The effects in children of road accidents. In: Mitchell M, ed. *The aftermath of road accidents. Psychological, social and legal consequences of an everyday trauma*. London: Routledge, 1996.
15 Di Gallo A, Barton J, Parry-Jones WLI. Road traffic accidents: early psychological consequences in children and adolescents. *Br J Psychiatry* 1997;170:358-62.
16 Stallard P, Law F. The psychological effects of traumas on children. *Child Soc* 1994;8:2, 89-97.
17 Mackway-Jones K, ed. *Emergency triage*. London: Manchester Triage Group/BMJ Books, 1997.
18 Nader KO, Kriegler JA, Blake DD, Pynoos RS. *Clinician administered PTSD scale for children (CAPS-C)*. Boston: National Center for PTSD.
19 Horowitz MJ, Wilner N, Alvarez W. Impact of event scale: a measure of subjective stress. *Psychosom Med* 1979;41:209-18.
20 Birleson P. The validity of depressive disorder in childhood and the development of a self-rating scale: a research report. *J Child Psychol Psychiatry* 1981;22:73-88.
21 Reynolds CR, Richmond BO. What I think and feel: a revised measure of children's manifest anxiety. *J Abnorm Child Psychol* 1978;6:271-80.
22 Udwin O. Children's reactions to traumatic events. *J Child Psychol Psychiatry* 1993;34:115-27.
23 Garmezy N, Rutter M. Acute reactions to stress. In: Rutter M, Hersov L, eds. *Child and adolescent psychiatry: modern approaches*. 2nd ed. Oxford: Blackwell, 1986.
24 Joseph S, Williams R, Yule W. *Understanding post-traumatic stress: a psychological perspective on PTSD and treatment*. Chichester: Wiley, 1997.

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