Australian Centre for Posttraumatic Mental Health

Summary of the Traumatic Stress Literature: 2004

Introduction

Purpose and Rationale

This is the second annual summary of the traumatic stress literature produced by the Australian Centre for Posttraumatic Mental Health (ACPMH). The 2003 summary is available on our website at www.acpmh.unimelb.edu.au

The aim is to provide a brief summary – around 5000 words (the length of a normal journal article; this one comes in at 5,500 plus references) – of key literature in the field of PTSD and related conditions published during the calendar year of 2004. The aim was not to provide a critical review; indeed, we have avoided critique or editorial comment. Rather, the aim was simply to draw the reader's attention to a selection of articles that were published during the year that we felt were important contributions. Since we do not provide a critique of the research, we strongly recommend that readers interested in a particular paper obtain a copy of the original and read it for themselves.

The advantages and disadvantages of these literature summaries have been the source of considerable discussion within the ACPMH. We would be very interested in your feedback about the structure, content, and utility of this document. If you would like to comment, please email us at acpmh-info@unimelb.edu.au and put "2004 Literature Summary" in the subject line.

Search Strategy and Content Overview

The literature was sourced using standard scientific databases, notably Medline and PsychInfo, with four search descriptors: "posttraumatic stress disorder", "PTSD", "acute stress disorder", and "ASD". This strategy yielded a total of 2361 papers published during 2004. Automatic downloads of these citations were received weekly and a proportion of those were selected for later inclusion in this annual summary. Most appeared in relatively prestigious journals, although a few are included from less established publications when appropriate. It is recognised that certain areas are somewhat under-represented, a reflection of the Centre's current staffing and research interests. We hope that this will be resolved in future years.

A total of 83 articles are included in this year's summary. We have divided the literature into the following eight areas although, of course, allocation to these categories was not always straightforward since papers often spanned more than one area:

1. Epidemiology (a broad spectrum of research including prevalence, course, and predictors)
2. Treatment
3. Clinical Guidelines
4. Phenomenology
5. Assessment and diagnosis
6. Theory
7. Biology
8. Children

Literature Summary

1. Epidemiology

1.1 Useful reviews in the epidemiology of PTSD published in 2004 included:

- Yehuda (2004) reviewed risk factors for the development of the PTSD including prior trauma, intensity of acute trauma response, and neuroendocrine changes which may influence formation and processing of traumatic memories.

- A review of 9/11 survey research reported that approximately 1 in 10 New Yorkers met probable PTSD related to September 11th, at 4 to 8 weeks after the attacks (Marshall & Galea, 2004). Individuals with prior PTSD, depression or tobacco, alcohol and marijuana use were at greater risk of increased severity. Nationwide rates of PTSD related to the 9/11 attacks were estimated at between 2.7% and 4.3% during this period. Anxiety symptoms and PTSD were strongly associated with number of hours of television watched on September 11th and during the following days. While the directionality of this relationship is an issue, the implications are important to consider given ever-increasing access to media coverage of traumatic events within the community.

- In a review of literature regarding PTSD in the elderly, Busuttil (2004) notes how little has been published relating directly to older persons. Although the adult literature provides some insight, specific research is needed to enhance understanding, assessment, management and appropriate treatment of PTSD in the elderly.

1.2 Several studies in 2004 examined the developmental course of PTSD, with particular emphasis on symptom trajectories following trauma exposure.

- Noting the wide variations in the existing literature on prevalence rates of psychopathology following traumatic injury, O'Donnell et al. (2004) conducted a longitudinal study with 363 severely injured patients. Using a rigorous methodology, the authors reported that 20% of participants met criteria for one or more psychiatric diagnosis 12 months post injury, with a PTSD rate of 10%.

- Thompson et al. (2004) reported that early numbing and hyperarousal symptoms increased conjointly with overall PTSD symptoms over the first two years following deployment to the Gulf War. While early hyperarousal and numbing symptoms predicted adjustment at two years, re-experiencing and avoidance symptoms showed no change and were not predictive of 2-year symptom severity. The authors suggest the need to target numbing and arousal in early interventions.

- In partial support, a longitudinal study of victims of the Oaklahoma bombing indicated that avoidance and numbing symptoms, but not re-experiencing, were predictive of PTSD and long-term functioning (North et al., 2004). Interestingly, the course of PTSD was almost exclusively chronic (89%) in this sample, with no delayed onset cases.

- Disaster workers exposed to an aircraft crash reported significantly higher rates of ASD and depression at 2, 7, and 13 months than a non-exposed comparison group (Fullerton, Ursano, & Wang, 2004). The presence of psychopathology at one time point increased the risk for subsequent development of other disorders.

- Schnurr, Lunney & Sengupta (2004) found that, while the development of PTSD in Vietnam veterans was related to a combination of premilitary, military, and postmilitary factors, failure to recover was related primarily to military and postmilitary factors.

- In one of the few studies of delayed onset, Gray et al. (Gray, Bolton, & Litz, 2004) assessed peacekeepers 15 weeks and 18 months after their return from deployment. A small but nontrivial subset of participants endorsed clinically significant levels of PTSD after a period of minimal distress. War-zone exposure and perceived meaningfulness of the mission predicted symptom course over the next 18 months.

- A rare examination of long term treatment outcomes in combat-related PTSD followed up veterans at 6 years post-treatment (Johnson, Fontana, Lubin, Corn, & Rosenheck, 2004). Although only a small sample, self-reports indicated both a positive view of the treatment program and improvement in several areas of functioning. Interestingly, hyperarousal and social isolation had increased and the sample had an extremely high mortality rate of 17%.

1.3 Cross-sectional studies utilizing appropriate control groups continue to inform understanding of the effects of traumatic exposure.

- Women who had been victims of a single adult rape, with no history of childhood abuse, were compared with survivors of severe nonsexual life-threatening traumatic events (Faravelli, Giugni, Salvatori, & Ricca, 2004). The rape victims showed significantly higher rates of PTSD, sexual, eating, and mood disorders, illustrating the particularly pathogenic nature of sexual assault.

- Using an anonymous survey design, Hoge et al. (2004) studied four US combat infantry units before recent deployments to Iraq (n=2530) or 3-4 months after return from combat duty in Iraq or Afghanistan (n=3671). Respondents deployed to Iraq reported significantly higher rates of meeting screening criteria for major depression, generalized anxiety disorder, or PTSD (15.6 to 17.1 percent) compared to duty in Afghanistan (11.2 percent) or before deployment to Iraq (9.3 percent). The largest difference was in the rate of PTSD. Only 23% - 40% of respondents who screened positive for a mental disorder sought mental health care; those with a disorder were twice as likely as negative respondents to report concern about stigmatization and other barriers.

- Ikin et al. (2004) reported higher rates of psychiatric disorder in Australian Gulf War compared to a military comparison group (31% vs 21%) a decade after deployment. There was a strong dose-response relationship between psychological disorders and number of reported Gulf War-related stressors.

- An examination of psychopathology in 269 randomly selected hospitalized injury survivors (D. F. Zatzick, Jurkovich et al., 2004) indicated that 58% of patients demonstrated high

levels of immediate posttraumatic distress or alcohol abuse/dependence. Significant independent predictors of posttraumatic distress included prior trauma, female gender, and ethnicity.

1.4 Increasing evidence indicates the significant impact of the September 11 terrorist attacks on the mental health of the US population.

- Two of these studies, (Ahern, Galea, Resnick, & Vlahov, 2004; E. B. Blanchard, Kuhn et al., 2004) found that peri-event panic, geographical proximity to New York City or the twin towers, gender, connectedness to WTC victims, and acute (ASD) symptoms influenced the development of PTSD following the 9/11 attacks.

- Despite findings of increased mental health problems, however, Druss & Marcus (2004), did not find greater psychotropic medication usage in the US during the weeks following 9/11, except among existing users residing in New York. There was no significant increase in the rate of new psychotropic prescriptions.

1.5 The majority of PTSD research has been conducted within developed western nations. Increasingly, however, studies have examined the psychological impact of trauma exposure across a diverse range of cultures.

- Njenga et al. (2004) found that 35% of 2833 Kenyans assessed 1-3 months after the US embassy bombing in Nairobi displayed symptoms approximating PTSD criteria. Female gender, unmarried status, lack of college education, seeing the blast, injury, not recovering from injury, not confiding in a friend, bereavement, and financial difficulty since the blast were all associated with increased symptoms.

- A survey of 799 adults highlighted the impact of prolonged conflict on mental health within Afghanistan (Cardozo et al., 2004). 62.0% of respondents reported experiencing at least 4 traumatic events during the past 10 years. Rates of depression and anxiety symptoms in nondisabled persons were 67.7% and 72.2% respectively and 71.7% and 84.6% in disabled persons. PTSD symptom prevelance was similar for both groups (42.1%/42.2%). Female gender was associated with worse mental health status, as was disability. Similar findings were reported by Scholte et al. (2004) for the Eastern province of Nangarhar. Both papers highlight the importance of addressing the lack of mental health resources in Afghanistan.

- A survey of Cambodians living in the Kampong Cham province revealed a high prevalence of anxiety symptoms (53%), as well as DSM-IV diagnoses of depression (42.4%) and PTSD (7.3%) (Dubois et al., 2004). Over 25% of respondents reported social impairment and 7.1% of respondents had triple comorbidity of PTSD, depression and anxiety. Comorbidity, being over 65 years, and experiencing violent events was associated with an increased risk for social impairment.

- A study of trauma exposure during the 1994 genocide in Rwanda found that 75.4% of the 2074 respondents were forced to flee their homes, 73.0% had a close family member killed and 70.9% reported lost or destroyed property (Pham, Weinstein, & Longman, 2004). 24.8% met criteria for PTSD.

- Refugees who seek asylum may be further traumatised by the asylum process itself. Laban et al. (2004) investigated Iraqis who had resided in the Netherlands for less than 6 months and more than 2 years. They found that prevalence of psychiatric disorders, including anxiety, depression, and somatoform disorders, was higher in the latter group (42% vs 66.2%), although rates of PTSD did not differ and were high in both groups. Duration of the asylum procedure was an important risk factor for psychiatric problems.

- A study on the impact of mental and physical disorders on work loss days (WLD) and quality of life (QOL) with samples in six European countries found PTSD to be one of the 10 disorders with the highest impact on WLD (Alonso et al., 2004). Results also suggested that mental disorders are an important determinant of work role disability and QOL, the impact of which is often greater than that of common chronic physical disorders.

2. Treatment

2.1 Several studies in 2004 examined the efficacy of a single treatment modality for traumatic stress sufferers:

- A study involving 152 patients displaying psychological distress following a physical injury examined the efficacy of a four-session CBT intervention compared with no intervention (Bisson, Shepherd, Joy, Probert, & Newcombe, 2004). Compared to the no intervention group, patients in the active condition displayed a significant reduction in total IES score, a trend towards a significant difference on the CAPS (p =.07), but no difference on HADS anxiety or depression.

- A pilot study investigating Cognitive-Behavioural Couple's Treatment (CBCT) for PTSD found that veterans reported significant improvements in their depression and anxiety and their partners reported improved relationship satisfaction (Monson, Schnurr, Stevens, & Guthrie, 2004).

- Zatzick et al. (2004) tested a stepped collaborative care (CC) intervention against usual care (UC) in a trauma centre. The CC involved post injury case management and motivational interviews for alcohol abuse, with pharmacotherapy and CBT for patients suffering persistent PTSD. Over time, CC patients were significantly less symptomatic compared with UC patients with regard to PTSD and alcohol abuse/dependence. CC patients showed a significant reduction in alcohol use with no change in PTSD symptoms, while PTSD symptoms increased over time in UC patients . The authors suggest that early mental health care interventions can be feasibly and effectively delivered from trauma centers.

2.2 Several 2004 studies provide a comparison of the efficacy of different PTSD treatment approaches:

- A study of Sudanese refugees suffering from PTSD and living in a Ugandan refugee settlement examined the efficacy of narrative exposure therapy (NET), supportive counseling, and psychoeducation one year after treatment (Neuner, Schauer, Klaschik,

Karunakara, & Elbert, 2004). Results indicated that NET was the most effective of the three approaches.

- In a follow up study comparing treatment outcomes for motor vehicle accident survivors who had earlier received CBT or supportive psychotherapy (SP), Blanchard et al. (2004) found continued significant advantages for CBT over SP one year after treatment, although this advantage had declined by the two-year follow-up.

- Hien et al. (2004)compared the efficacy of three treatments with low-income urban women suffering comorbid PTSD and substance use disorder: 1) manualized CBT addressing both PTSD and substance abuse; 2) manualized CBT addressing substance abuse only; and 3) standard community care for PTSD and substance use disorder. Following three months of treatment, there was a significant reduction in substance abuse and PTSD in both the CBT conditions but a worsening of symptoms in the community care group. These improvements were maintained at 6-month and 9-month follow-up.

- In a study of 54 female survivors of sexual and nonsexual assault with chronic PTSD, Foa & Rauch (2004) found decreases in negative cognitions in participants from both a prolonged exposure and a prolonged exposure with cognitive restructuring treatment group. The addition of cognitive restructuring did not augment cognitive changes above those produced by exposure. A significant relation between reduction of negative cognitions and reductions in PTSD symptoms was found.

2.3 Several studies on the efficacy of drug treatments for PTSD were conducted in 2004:

- A pilot study (N=3) testing the hypothesis that cortisol will reduce reexperiencing and related symptoms in patients with chronic PTSD found a significant treatment effect, with all participants experiencing a reduction in reexperiencing symptoms and one also showing an improvement in avoidance symptoms (Aerni et al., 2004).

- Building on prior research that demonstrated an early and sustained effect for sertraline on anger in patients with PTSD, Davidson, Landerman & Clary (2004) conducted a study using the same data set to asses the predictability of ultimate response to sertraline based on its effect on anger at one week. Increased anger at one week predicted non-response to treatment in both drug and placebo groups, suggesting that clinicians should consider changes in anger when determining whether or not to continue medication.

- Labbate et al. (2004) explored whether patients with PTSD and an alcohol use disorder would demonstrate poorer response to sertraline if they also presented initially with comorbid anxiety or depression. Contrary to this hypothesis, findings indicated that additional anxiety or mood disorder comorbidity did not decrease treatment response.

2.4 Addressing factors influencing recovery:

- In a review of the area, Benight highlights that perceived coping self efficacy is an important mediator of posttraumatic recovery across a wide range of traumas (Benight &

Bandura, 2004).

- Hembree et al. (2004) explored the hypothesis that variables associated with natural recovery from trauma would also be predictive of treatment outcome. She found that female assault victims with chronic PTSD who: a) experienced trauma in childhood; and b) sustained injury during the adult assault were more likely to show poor response to CBT treatment.

2.5 CBT treatment approaches for patients with comorbid PTSD and "severe mental illness" received increasing attention in 2004:

- Frueh et al. (2004) propose a model for a comprehensive, multi-component CBT program for individuals with both PTSD and severe mental illness.

- A CBT program for PTSD sufferers with severe mental illness is also described by Mueser & Rosenberg (2004) who describe the treatment program, provide clinical vignettes of individuals who have participated in the program, discuss results of a pilot study of the intervention, and report consumer and expert opinions of the program.

3. Clinical Practice Guidelines

3.1 Two important clinical practice guidelines were published in 2004, with a third appearing in final draft form:

- The International Consensus Group on Depression and Anxiety published an update to their 2000 Consensus Statement on Posttraumatic Stress Disorder (Ballenger et al., 2004).

- The American Psychiatric Association published their PTSD treatment guidelines (Ursano et al., 2004) (See www.psych.org/psych_pract/treatg/pg/prac_guide.cfm). These APA provide an overview of common approaches, but make little comment about the relative efficacy of different treatments.

- In contrast, the draft guidelines produced in 2004 by the National Institute for Clinical Excellence (NICE) in the UK make strong statements regarding the efficacy of CBT and EMDR as front line treatments, with pharmacotherapy as a second line treatment (see www.nice.org.uk/page.aspx?o=248114). The final guidelines are expected in early 2005.

4. Phenomenology

4.1 Several reviews examining differential response to trauma were published during 2004.

- Lichtenthal, Cruess & Prigerson (2004) reviewed complicated grief (CG) and argued that this concept should be considered a distinct psychopathological diagnostic entity, as the phenomenology, risk factors, clinical correlates, course, and outcomes for CG differ from

those of PTSD, MDD and adjustment disorder (AD) and require specifically designed clinical interventions.

- Briere & Jordan (2004) review major forms of violence against women and their known psychological effects, variables that combine to determine the effects of such victimization, victim variables and sociocultural factors, implications for psychological assessment and the need for multitarget, multimodal treatment approaches.

- Galovski & Lyons (2004) reviewed "secondary traumatisation" within combat veterans' families (i.e., the consequences of veterans' PTSD on their families). Veterans' PTSD mediated the effect of combat experience on the family, with numbing and arousal symptoms especially predictive of family distress. To a lesser extent, veterans' anger was also associated with troubled family relationships.

- A review of positive outcomes following trauma was conducted by Linley & Joseph (2004) including a discussion of a range of factors that were consistently associated with adversarial growth.

- Brady, Back & Coffey (2004) review self-medication and susceptibility hypotheses of the etiological relationship between PTSD and Substance Use Disorders (SUD), the contribution of genetic/neurobiological/environmental factors to the high rate of PTSD-SUD co-occurrence, promising preliminary results of integrated psychotherapy treatment approaches for both disorders, and other advances in the study of comorbid PTSD and SUDs.

- Following a review of the research on the link between peritraumatic dissociation and PTSD, Candel & Merckelbach (2004) note that studies to date have relied too heavily on retrospective reports of dissociative reactions during trauma. The authors argue that this methodology has limitations given that the accuracy of descriptions of past emotional states by PTSD patients in particular, and people in general, is often restricted by factors such as forgetting, attribution, and malingering.

4.2 PTSD and Major Depressive Disorder (MDD) are frequently comorbid, with implications for the diagnosis and treatment of posttraumatic sequelae.

- High levels of PTSD (75% of the sample) and MDD (54% of the sample) were observed among female victims of intimate partner violence (IPV) (R. D. V. Nixon, Resick, & Nishith, 2004). PTSD severity and psychological aggression by an abuser predicted 52% of the variance in depressive symptoms.

- In a longitudinal study of injury survivors, O'Donnell, Creamer & Pattison (2004) found that PTSD and MDD comorbidity was best represented as part of a single general traumatic stress construct, suggesting a shared vulnerability with similar predictive variables. For a small minority, however, 3-month depression existed independently from PTSD, suggesting depression may exist as a separate construct in the acute, but not chronic, aftermath of trauma.

- A survey of 1966 women from Dresden aged 18-45 years indicated that 29% of those diagnosed with PTSD had comorbid MDD. Exposure to trauma during early childhood resulted in a similar level of risk for the development of either MDD or PTSD (17% and 23.3% of the sample respectively). Exposure after age 13, however, resulted in greater risk of developing PTSD than depression (13.3% vs 6.5%) (Maercker, Michael, Fehm, Becker, & Margraf, 2004).

- An assessment of 94 civilians with chronic PTSD (Tarrier & Gregg, 2004) revealed that over half reported an aspect of suicidality, a proportion significantly greater than that found within the general population. Increased life impairment and depression scores were associated with the presence of suicidal ideation, suicide plans and attempts. Psychotropic medication was also associated with the latter 2 aspects of suicidality.

4.3 The nature and severity of symptomatology required for a PTSD diagnosis continue to be examined and debated.

- Despite the inclusion of sleep problems within the PTSD criteria, Breslau, Roth et al. (2004) found that PTSD patients did not differ from control subjects on standard polysomnographic measures. They suggested, however, that greater rates of brief arousals from REM sleep in patients with PTSD may explain an amplified perception of poor sleep.

- Two studies published in 2004 (N. Breslau, Lucia, & Davis, 2004; Gudmundsdottir & Beck, 2004) explored the construct of partial PTSD, with the former noting that a full PTSD diagnosis (in comparison with partial) effectively differentiates the most severely impaired trauma survivors and the latter using a statistical approach to assist identification of partial PTSD.

5. Assessment and Diagnosis

5.1 Several studies in 2004 examined screening and assessment strategies for PTSD and related comorbidity.

- Research participants who have experienced multiple traumas are usually asked to nominate "the worst" for the purposes of PTSD assessment. Breslau, Peterson et al. (2004) examined the potential bias produced by community surveys that measure conditional PTSD according to the 'worst' trauma designated by the respondent. They concluded that this approach produced very little bias in estimating the conditional probability of PTSD, with alternative approaches producing similar outcomes.

- The Social Acknowledgement Questionnaire (SAQ) has three reliable factors - recognition as victim, general disapproval, and family disapproval - which correlate with measures of PTSD severity and may tap into an important recovery factor (Maercker & Muller, 2004).

- Forbes et al. (2004) found the Dimensions of Anger Reactions scale (DAR) to be a reliable measure of trait anger in PTSD populations.

- Creamer, O'Donnell & Pattison (2004) investigated the relationship between ASD just prior to discharge and PTSD 3 and 12 months later in severely injured trauma survivors. The incidence of ASD was 1%, with a PTSD incidence of 9% at 3 months and 10% at 12 months. Only re-experienceing and arousal predicted a categorical PTSD diagnosis. Rare endorsement of dissociative symptoms resulted in a high proportion of false negative PTSD diagnoses. Findings suggest that the ASD diagnosis is of limited benefit in predicting subsequent development of PTSD in this population.

5.2 The effect of the assessment process on both respondents and on the measurement of PTSD itself continues to be of interest to researchers.

- A survey of New York residents one year after the September 11 attacks (Boscarino et al., 2004) found little evidence to indicate adverse consequences of involvement in posttrauma research. The majority of respondents were positive regarding participation.
- Aziz & Kenford (2004) compared face to face interview and telephone assessments of veterans using the CAPS and HAM-D. They found high consistency between the two approaches (82% agreement for CAPS and 85% for HAM-D), supporting the reliability of phone-interviews.

6. Theory

6.1 Several papers in 2004 highlighted potential mechanisms underlying adjustment to traumatic events:

- Dohrenwend et al. (2004) discuss the possible contribution of tertiary appraisals of wartime experience to successful postwar adaptation. They report that over 70% of US veterans appraised the impact of their Vietnam service on their present life as mainly positive, and explore the relationship between positive appraisals and indicators of wartime and postwar functioning, including PTSD. Results suggest that, rather than signifying defensive denials related to maladaptive outcomes, mainly positive tertiary appraisals are indicative of successful wartime and postwar adaptation.

- Nixon, Resick & Nishith (2004) conducted a study with 73 rape victims, 92% of whom had current PTSD, and examined the relation between the degree of accumulated stress and deficits in verbal memory. Results indicated a significant correlation between prior exposure to high-magnitude stressors and poorer performance on verbal memory tasks.

- Attributions of personal responsibility were explored in burn victims, finding that 23% of those reporting "other-blame" were diagnosed with ASD, compared with none of those with self-blame. Further analyses confirmed that self-blame was associated with lower rates of ASD whereas other-blame was related to higher rates of ASD (Lambert, Difede, & Contrada, 2004).

- In a related study, Koss et al. (Koss & Figueredo, 2004) found that characterological self-blame determines initial levels of psychosocial distress, while reductions in behavioral self-

blame drive recovery. These effects were wholly mediated through self-blame's association with alterations in beliefs about self and others.

- Research involving female victims of sexual assault (n=135) or sudden bereavement (n=159) examined relations between perceived past, present, and future control and adjustment (Frazier, Steward, & Mortensen, 2004). In both samples, present control was associated with better adjustment whereas past control was not related to adjustment. Only the sexual assault sample demonstrated an association between future control and better adjustment.

- Richard McNally and Chris Brewin both published influential books on PTSD in 2003. This unusual article (Brewin, McNally, & Taylor, 2004) interviews them about points of contention and provides interesting perspectives on several controversial topics in the area.

- Christopher (2004) outlines a biopsychosocial evolutionary approach to understanding the traumatic stress and explores the clinical implications.

6.2 Tim Dalgleish made several theoretical contributions to the literature in 2004:

- Dalgleish (2004a) compared single representational and multirepresentational cognitive theories, arguing that the latter provide a more complete account of PTSD data. They note that a comprehensive cognitive theory of PTSD requires at least three separate representational elements: associative networks, verbal/propositional representations, and schemas.

- Dalgleish & Power (2004) propose a taxonomy of emotional disorders that resemble PTSD in terms of re-experiencing and avoidance symptoms, but involving core emotions that differ from the intense fear and anxiety typically associated with PTSD . They argue that the general framework can be extended to other appraisal dimensions such as loss and, consequently, to other emotions such as sadness.

- Finally, Dalgleish explored counterfactual thinking (CFT; reflecting on an event and simulating alternative outcomes) and found that trauma survivors typically produce CFT that transforms aspects of their own behaviour during the traumatic event and improves the event's outcome. This was true across event types and was unrelated to the level of trauma-related distress (Dalgleish, 2004b).

6.3 Several papers presented findings in relation to reexperiencing symptoms:

- In an analogue study, Holmes, Grey & Young (2005) assessed the effect on intrusive memories of concurrent tasks performed while viewing a traumatic film. A verbal distraction task was associated with increased frequency of later intrusions, whereas a visuospatial pattern tapping task reduced the frequency of later intrusions.

- Responses, including acoustic startle, in veterans with and without PTSD were recorded while participants viewed emotionally evocative photographs at baseline, post exposure to a trauma-related stressor, and post exposure to a non-trauma-related stressor (Miller & Litz,

2004). Although patterns of emotional response were equivalent at baseline, the pattern of startle modulation exhibited by PTSD participants post exposure to a trauma-related stressor suggested greater defensive reactivity and reduction in visual perceptual engagement. The findings suggest that trauma-related reexperiencing primes subsequent negative emotional responding in individuals with PTSD

- Bryant et al. (2004) found that traumatic brain injury (TBI) participants with PTSD had significantly higher HRs at 1 week but not at 1 month compared to non-PTSD participants, concluding that fear conditioning can occur outside awareness.

7. Biology

7.1 While the role of the HPA axis in the development of PTSD continues to be of interest, studies assessing cortisol levels in PTSD have produced mixed results.

- Two longitudinal studies conducted by Young & Breslau (2004a, 2004b) compared cortisol levels of PTSD respondents with those of trauma-exposed participants without PTSD and non trauma-exposed respondents. The only elevation in cortisol levels associated with PTSD was that of female participants in the first study who suffered comorbid major depression (MDD). The lifetime PTSD group however, displayed significantly higher catecholamine levels in comparison to the non trauma group and the trauma exposed non-PTSD group (who had the lowest urinary catecholamine levels).

7.2 The predictive value of early physiological responses in identifying trauma survivors at risk of developing PTSD is of value in terms of diagnosis and early intervention.

- Elsesser, Sartory & Tackengerg (2004) compared heart rate, startle response, and attentional bias to trauma-relevant pictures in recent trauma victims, chronic PTSD patients and healthy controls. Both the recent trauma survivors and the chronic PTSD group showed a significant HR acceleration to trauma-related material. Bias away from trauma-related material was related to intrusion severity in recent trauma victims and bias toward material increased with amplitude of the HR response in PTSD patients.

7.3 The use of neuroimaging to investigate potential biological pathogensis in PTSD is continuing to produce mixed findings.

- A review of structural neuroimaging findings and current theories regarding structural brain damage in PTSD (Villarreal & King, 2004) discusses hippocampal changes, associated connections to the entorhinal cortex and amygdala, and implications for learning, memory and emotion. Emerging literature on other structural changes, including brain damage in children with PTSD, is reviewed.

- Lindauer, et al. (Lindauer et al., 2004) reported that hippocampal volume was significantly smaller in police officers with PTSD compared to a control group. A negative correlation was found between reexperiencing symptoms and hippocampal volume in the PTSD group.

Amygdala, parahippocampal gyrus, grey matter, white matter and cerebrospinal fluid volumes did not differ significantly between the two groups.

- Using FMRI and functional connectivity analysis, Lanius et al. (2004) found significant differences in interregional brain activity correlations during the recall of traumatic memories for traumatized subjects with and without PTSD. Subjects without PTSD showed greater activation in various left hemisphere regions, while those with PTSD showed enhanced right hemispheric activity. These findings may reflect the nonverbal nature of traumatic memory recall in PTSD subjects, compared to a more verbal pattern of traumatic memory recall in comparison subjects.

8. Children

8.1 While the focus of this review is on adult posttrauama pathology, several studies were published during 2004 examining issues of traumatic stress in children. Some useful review papers concerning children included:

- The impact of war trauma on child mental health was reviewed by Barenbaum, Ruchkin & Schwab-Stone (2004), with attention to the development of problems, intervention and prevention, and suggestions for future directions in research and policy.

- Carr (2004) also reviews studies concerned with children suffering PTSD and describes an evidence-based assessment and treatment protocol for children and adolescents with PTSD.

8.2 Other key papers published in 2004 on aspects of children and trauma included the following:

- Derluyn et al. (2004) interviewed 301 former child soldiers in Uganda, who had been abducted by rebels at a young age (mean 12.9 years) and for a long time (mean 744 days). Almost all the children had experienced several traumatic events. 77% had seen someone being killed, and 39% had had to kill someone themselves. IES-R scores indicated that 97% reported traumatic stress reactions of clinical importance.

- Two studies published in 2004 examined the psychological outcome of children and adolescents admitted to emergency departments following MVAs (Stallard, Salter, & Velleman, 2004; B. Bryant, Mayou, Wiggs, Ehlers, & Stores, 2004). Both found considerable posttrauma psychopathology. Stallard et al. (2004) reported that 29.1 % of children fulfilled diagnostic criteria for PTSD, 20.3% had significant levels of anxiety, and 17.7% had scores above threshold levels for possible clinical depression. Consistent with the adult literature, girls were significantly more likely than boys to develop PTSD. Bryant et al. (2004) found that 15% suffered ASD, with 25% meeting criteria for PTSD at 3 months and 18% at 6 months. Travel anxiety was also frequent.

- Abram et al. (2004) randomly selected a stratified sample of newly arrested adolescents in juvenile detention and found that 93% had experienced 1 or more traumas (mean = 14.6 incidents). 11.2% of the sample met criteria for PTSD in the past year and nearly half of this group reported witnessing violence as the precipitating trauma for the PTSD.

- Although not directly related to PTSD, Turner et al. studied a random sample of adolescents aged 18 to 23 (Turner & Lloyd, 2004). As predicted, they found that level of lifetime exposure to adversity was associated with an increased risk of subsequent onset of depressive and/or anxiety disorders. This relationship remained after controlling for prior psychopathology.

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