

Post-combat syndromes from the Boer war to the Gulf war: a cluster analysis of their nature and attribution

Edgar Jones, Robert Hodgins-Vermaas, Helen McCartney, Brian Everitt, Charlotte Beech, Denise Poynter, Ian Palmer, Kenneth Hyams, Simon Wessely



The full version of this article appears on bmj.com

Abstract

Objectives To discover whether post-combat syndromes have existed after modern wars and what relation they bear to each other.

Design Review of medical and military records of servicemen and cluster analysis of symptoms.

Data sources Records for 1856 veterans randomly selected from war pension files awarded from 1872 and from the Medical Assessment Programme for Gulf war veterans.

Main outcome measures Characteristic patterns of symptom clusters and their relation to dependent variables including war, diagnosis, predisposing physical illness, and exposure to combat; and servicemen's changing attributions for post-combat disorders.

Results Three varieties of post-combat disorder were identified—a debility syndrome (associated with the 19th and early 20th centuries), somatic syndrome (related primarily to the first world war), and a neuropsychiatric syndrome (associated with the second world war and the Gulf conflict). The era in which the war occurred was overwhelmingly the best predictor of cluster membership.

Conclusions All modern wars have been associated with a syndrome characterised by unexplained medical symptoms. The form that these assume, the terms used to describe them, and the explanations offered by servicemen and doctors seem to be influenced by advances in medical science, changes in the nature of warfare, and underlying cultural forces.

Introduction

It is now clear that service in the Gulf war is associated with an increased rate of reported symptoms and worsening subjective health,¹ even if most research has not confirmed the existence of a specific new syndrome.²⁻⁴ The question we address is whether this phenomenon is unique to the Gulf war or has been seen after previous conflicts.

This study was designed to discover more about the essential characteristics of post-combat syndromes from 1854. When assessed by their symptomatology are they the same, distinct, or akin to varieties within a single species? Did cultural forces and technological advance in warfare affect the overall form of these

disorders, the descriptive terms, and the explanations adopted by veterans and doctors?

Subjects and methods

Data sources

We used war pension files of members of the British army as the primary data source. The assessment procedure for soldiers (regular boards composed of two doctors) did not change greatly over the study period. Medical notes were in most cases detailed, and symptoms were recorded throughout an individual's military service and after discharge. We excluded cases if a serviceman was found to be suffering from an organic disorder or a major mental illness. We did not include prisoners of war.

From six conflicts we identified 10 post-combat syndromes that typified the conflicts, and we included 1856 representative subjects in our study (table 1).

Table 1 War syndromes identified from war pensions for 1856 British servicemen

Conflict and syndrome	No of cases
Victorian campaigns (1854-c1895)	
Palpitation	19
Debility	9
Boer war (1899-1902)	
DAH	200
Rheumatism	200
First world war (1914-18)	
DAH	200
Neurasthenia	200
Gassed	167
Nurses:	
DAH	24
Neurasthenia	49
Second world war (1939-45)	
Effort syndrome	67
Psychoneurosis	200
Dyspepsia	100
Malayan (1948-60) and Korean (1951-53) conflicts	
Effort syndrome	1
Psychoneurosis	15
Dyspepsia	5
Gulf war (1991)	
Gulf related illness	400

DAH=disordered action of the heart.

Department of Psychological Medicine, Guy's, King's, and St Thomas's School of Medicine, London SE5 8AZ

Edgar Jones
reader

Robert Hodgins-Vermaas
research assistant

Charlotte Beech
research assistant

Denise Poynter
research assistant

Simon Wessely
professor

King's College London at the Joint Services Command and Staff College, Watchfield
Helen McCartney
lecturer

Institute of Psychiatry, London

Brian Everitt
professor

Royal Defence Medical College, Fort Blockhouse, Gosport

Ian Palmer
professor

Office of Public Health and Environmental Hazards, Department of Veterans Affairs, Washington DC, USA

Kenneth Hyams
chief consultant

Correspondence to: E. Jones
E.jones@hogarth7.demon.co.uk

BMJ 2002;324:321-4

Commonest symptoms in 1856 British servicemen with post-combat syndromes in order of frequency

1 Difficulty completing tasks	14 Irritability
2 Fatigue or lethargy	15 Forgetfulness or memory loss
3 Shortness of breath	16 Back pain
4 Persistent anxiety	17 Poor concentration
5 Weakness	18 Stomach cramps or abdominal pain
6 Rapid or irregular heartbeat	19 Heavy or persistent sweating
7 Headaches	20 Changes in personality
8 Difficulty sleeping	21 Nightmares
9 Tremor, shaking, or trembling	22 Jumpiness or easily startled
10 Dizziness or giddiness	23 Tenderness or soreness
11 Depression or low mood	24 Persistent cough
12 Pains in joints	25 Diarrhoea
13 Changes in weight	

Data collection

We recorded the following information: servicemen's biographical details; pension details; military record; 94 symptoms in defined groups (fatigue; cognition; cardiovascular and respiratory; gastrointestinal; genitourinary; central nervous system; locomotor system; eye; ear, nose, and throat; skin; psychological state; sleep problems; weight changes; and self inflicted wounds); results of medical investigations; servicemen's explanations for their symptoms and comments of examining physicians; and military conduct with a summary of offences.

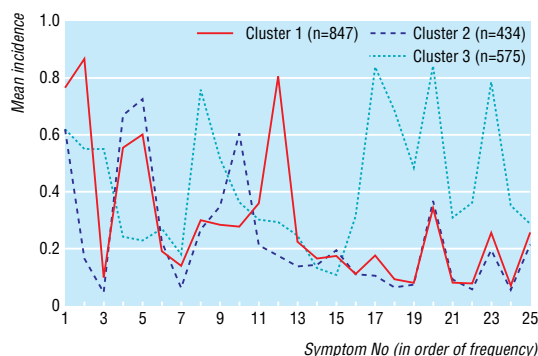
Statistical analysis

The 94 possible symptoms were reduced to the 25 most common (box). The resulting dataset with 1856 individuals described by 25 variable values was then subjected to cluster analysis.^{5 6}

Results

The analysis resulted in three clusters of post-combat syndromes (see figure).

Cluster 1 (n=847)—This is indicative of a debility syndrome but without psychological or cognitive symptoms. Fatigue, difficulty completing tasks, shortness of breath, and weakness were prominent symptoms. Rapid heartbeat, tremor, headaches, dizziness, pains in joints, difficulty sleeping, changes in weight, and anxiety were moderately represented. Psychological symptoms such as depression, memory impairment, irritability, and poor concentration were



Mean incidence of 25 commonest symptoms in 1856 British servicemen with post-combat syndromes

notably absent. Cases were not drawn from any particular conflict (table 2), though 74% of subjects in the group came from wars fought before 1918.

Cluster 2 (n=434)—This is indicative of a somatic syndrome focused on the heart. Rapid heartbeat, shortness of breath, fatigue and dizziness were prominent. Difficulty completing tasks, headaches, tremor, and anxiety were moderately represented. This group represents only 39% of all cases of DAH and 44% of cases of effort syndrome, which reflects the degree of overlap in the three clusters and the fact that servicemen diagnosed with functional heart disorders had symptoms related to other areas of the body. Servicemen from the first world war, a conflict dominated by functional cardiac disorders, comprised 49% of the group, whereas the second world war and Gulf war contributed relatively few servicemen (19% and 9% respectively) (table 2).

Cluster 3 (n=575)—This is indicative of a neuropsychiatric syndrome with a range of associated somatic symptoms. Fatigue, headaches, depression, anxiety, and difficulty sleeping were prominent. Moderately represented were difficulty completing tasks, forgetfulness, rapid heartbeat, shortness of breath, tremor, dizziness, weakness, pains in joints, back pain, sweating, irritability, poor concentration, jumpiness, changes in personality, nightmares, and weight change. Over half of the examples of neurasthenia (52%), psychoneurosis (84%), and Gulf war related illness (54%) fell into this group.

Predicting cluster membership

Variations between the individual wars (which were closely correlated with diagnostic terms) proved to be the best single predictor of cluster membership in a logistic regression analysis. Physical illness preceding onset of war syndrome, military conduct, and exposure to combat also had a mild predictive effect.

Predicting cluster membership by war

The debility syndrome was largely drawn from veterans of the Victorian campaigns, the Boer war, and the first world war (table 2). The somatic syndrome represented the first world war with subsidiary elements drawn from the Boer war and the second world war. The neuropsychiatric cluster was predominantly composed of second world war and Gulf war servicemen. This suggests that there is an important temporal element running through these post-combat syndromes.

Predicting cluster membership by contemporary diagnosis

Because diagnosis tends to follow changes in medical knowledge and cultural developments, the temporal pattern identified in the analysis by war was also apparent from this variable. The debility syndrome, shown to be associated with the late 19th and early 20th centuries, also reflected the diagnoses of that period, notably DAH (disordered action of the heart) and rheumatism. In addition, contemporary labels bear some relation to the three groups, though the matching is not exact.

Predicting cluster membership by servicemen's attributions of symptoms

Servicemen's explanations for these post-combat syndromes were culturally conditioned and varied

across the century tied to prevailing health beliefs and concerns. Boer war servicemen diagnosed with DAH generally believed it to be the result of either physical illness (26%) or of physical exertion (25%). A different pattern emerged in the first world war, with physical exertion accounting for 45% of the DAH sample and 43% of the neurasthenia group. However, a substantial number of the latter (34%) attributed their symptoms to the psychological stress of military service. They had, perhaps, been educated by psychologically minded physicians and the gradual incursion of psychiatric texts into medical and general literature.

The second world war saw this process continue, and 41% of the servicemen with psychoneurosis attributed their symptoms to psychological stress arising from military service, and a further 5% attributed their symptoms to stresses related to their domestic situation. By contrast, 44% of the dyspepsia population ascribed their symptoms to the physical exertions of active service, as did 37% of those with effort syndrome. Only 9% of the Gulf war sample believed that stress played a causal role, whereas 34% thought that their condition was the result of toxic exposure.

Contemporary attributions made by servicemen broadly correlated with the symptom characteristics of the three groups. In the debility cluster, 61% believed that their illness was related to a physical illness, physical injury or strain, climate, or toxic exposure. By comparison, 143 (64%) of the 224 who believed the psychological stress of military service was the cause of their illness came from the neuropsychiatric cluster. Equally, only 23 (12%) of the 186 who believed that they were suffering from a physical illness were found in this group.

Discussion

Based on symptomatology, our study identified three types of post-combat syndrome. We found significant differences in the expression of symptoms between the three groups, implying that there is no single presentation common to all modern wars. Variations seem to be determined by the nature of combat, contemporary medical knowledge, and important health beliefs and fears.

Implications for Gulf war syndrome

In terms of symptoms, illness related to the Gulf war does not stand apart from the other conflicts. Although most cases fell into the neuropsychiatric cluster, Gulf war veterans are found in all three groups. Hence, not all servicemen engaged in the same conflict can be categorised in the same way, though we did find underlying trends.

Gulf war syndrome has often been attributed to environmental hazards such as depleted uranium, pesticides, and the side effects of vaccinations. However, it may be inferred that the three syndromes are unrelated to any particular exposure as they occurred during several wars, albeit with different frequencies. An analysis of death certificates also showed that veterans with post-combat syndromes did not develop a particular organic illness or have increased mortality.^{7 8}

Table 2 Distribution of syndrome clusters in 1856 British servicemen with post-combat syndromes by conflict. (Values are numbers (percentages) of cases)

Conflict	Post-combat syndrome cluster		
	Debility syndrome	Somatic syndrome	Neuropsychiatric syndrome
Victorian campaigns (n=28)	23 (82)	4 (14)	1 (4)
Boer war (n=400)	308 (77)	91 (23)	1 (0.3)
First world war (n=640)	292 (46)	213 (33)	135 (21)
Second world war (n=367)	76 (21)	83 (23)	208 (57)
Malayan and Korea conflicts (n=21)	2 (10)	5 (24)	14 (67)
Gulf war (n=400)	146 (37)	38 (10)	216 (54)
Total	847	434	575

Difference between clusters: $\chi^2=523$, $df=10$, $P<0.001$.

Reasons for apparent changes in post-combat syndromes

Our findings are based on symptoms extracted from historical medical records subject to contemporary clinical perspectives. Both doctors and patients were probably more alert to symptoms that related to current health issues. In the first world war, when functional heart disorders accounted for over 15 000 admissions in 1915 and the causes of DAH were still being investigated,⁹ cardiac symptoms were given prominence. By proposing the underlying psychological foundation of effort syndrome, Paul Wood and Maxwell Jones at Mill Hill plausibly prevented a further flood of cases during the second world war. During this conflict, when the epidemic of duodenal ulcers was almost at its peak,^{10 11} gastrointestinal symptoms also became a focus for attention. Discharges from the British army reflected these trends in medical understanding.¹² Although the prominence given to symptoms may have been influenced by prevailing diagnostic paradigms, this bias was mitigated by the fact that servicemen were examined over several decades and by different doctors, sometimes with specialist input.

Shorter has argued that the nature of medically unexplained syndromes has itself changed with a shift from apparently neurological symptoms such as paralyses, tremors, and fits to more ill defined and subjective symptoms such as fatigue, pain, and depression.¹³ The apparent reversal of the trend towards greater psychological attribution during the Gulf war may reflect the unique biohazards of that conflict or a counter reaction to the increased awareness of post-traumatic stress disorder from 1980. Although our data are consistent with these cultural shifts, we propose that what has changed is not the symptoms themselves but the way in which they have been reported by veterans and interpreted by doctors.¹⁴

Conclusions

Post-combat syndromes have arisen after all major wars over the past century, and we can predict that they will continue to appear after future conflicts. What cannot be accurately forecast is their form, as they are moulded by the changing nature of health fears and warfare. Because war syndromes have been recognised as pensionable disorders and proved difficult to treat, they have cost governments considerable sums in financial assistance. In order to introduce preventive measures and devise effective clinical interventions, it is necessary to understand their characteristics. If each new post-combat syndrome is not interpreted as a unique or novel illness but as part of an understand-

What is already known on this topic

Service in the Gulf war is associated with an increased rate of reported symptoms and worsening subjective health

Post-combat syndromes have been described after most modern conflicts from the US civil war onwards

What this study adds

There seems to be no single post-combat syndrome but a number of variations on a theme

The ever changing form of post-combat syndromes seems to be related to advances in medical understanding, the developing nature of warfare, and cultural undercurrents

Because reported symptoms are subject to bias and changing emphasis related to advances in medical science or the discovery of new diseases, the characterisation of individual syndromes has to be treated with caution

Attributions by servicemen are generally consistent with symptom characteristics, though there seems to be a growing reluctance to consider the stress of military service as a cause

able pattern of normal responses to the physical and psychological stress of war, then it may be managed in a more effective manner.

Specialist advice was sought in cardiology from Drs Stephen Holmberg and Iqbal Malik, in gastroenterology from Dr Ian Forgacs and Sir Christopher Booth, in radiology from Drs

Michele Marshall, Erica Denton, and C N O'N Digges, and in medicine from Professor Harry Lee and Dr Roger Gabriel. The Department of Social Security provided access to the war pensions archive, and we thank Dr Elizabeth Braidwood, Jenny Robb, and Paul Griffiths. The Army Historical Branch helped with military sources.

Contributors: See *bmj.com*.

Funding: The study was funded by a grant from the US Army Medical Research and Materiel Command under grant DAMD17-98-1-8009. EJ was supported by a grant from the US Department of Defense.

Competing interests: None declared, except funding for EJ.

- 1 Unwin C, Blatchley N, Coker W, Ferry S, Hotopf M, Hull L, et al. Health of UK servicemen who served in Persian Gulf war. *Lancet* 1999;353:169-78.
- 2 Ismail K, Everitt BS, Blatchley N, Hull L, Unwin C, David A, et al. Is there a Gulf war syndrome? *Lancet* 1999;353:179-89.
- 3 Doebbeling BN, Clarke WR, Watson D, Torner JC, Woolson RF, Voelker MD, et al. Is there a Gulf war syndrome? Evidence from a large population-based survey of veterans and nondeployed controls. *Am J Med* 2000;108:695-704.
- 4 Haley RW, Thomas KL, Hom J. Is there a Gulf war syndrome? Searching for syndromes by factor analysis of symptoms. *JAMA* 1997;277:215-22, 278:388.
- 5 Everitt BS, Landau S, Leese M. *Cluster analysis*. London: Edward Arnold, 2001.
- 6 Tibshirani R, Walther G, Hastie T. Estimating the number of clusters in a data set via the gap statistic. *J R Soc Stat* 2001;63:411-23.
- 7 Grant RT. Observations on the after-histories of men suffering from the effort syndrome. *Heart* 1925;12:121-42.
- 8 Kang HK, Bullman TA. Mortality among US veterans of the Persian Gulf war: 7-year follow up. *Am J Epidemiol* 2001;154:406-9.
- 9 Mitchell TJ, Smith GM. *History of the great war based on official documents, medical services*. London: HMSO, 1931:103, 315.
- 10 Langman MJS. *The epidemiology of chronic digestive disease*. London: Edward Arnold, 1979.
- 11 Tidy HL. Discussion on dyspepsia in the forces. *Proc R Soc Med* 1941;34:21-36.
- 12 Bergman BP, Miller SASJ. Unfit for further service: trends in medical discharge from the British army 1861-1998. *J R Army Med Corps* 2000;146:204-11.
- 13 Shorter E. Paralysis—the rise and fall of a hysterical symptom. *J Soc Hist* 1986;19:549-82.
- 14 Shorter E. *From paralysis to fatigue, a history of psychosomatic illness in the modern era*. New York: Free Press, 1992.

(Accepted 3 January 2002)

Discrepancies in autobiographical memories—implications for the assessment of asylum seekers: repeated interviews study

Jane Herlihy, Peter Scragg, Stuart Turner

Traumatic Stress Clinic, London W1T 4PL

Jane Herlihy
psychologist in clinical training

Stuart Turner
consultant psychiatrist

University College, University of London, London WC1E 6BT

Peter Scragg
lecturer in psychology

Correspondence to: J Herlihy
jane@herlihyj.freeserve.co.uk

BMJ 2002;324:324-7

Abstract

Objective To investigate the consistency of autobiographical memory of people seeking asylum, in light of the assumption that discrepancies in asylum seekers' accounts of persecution mean that they are fabricating their stories.

Design Repeated interviews.

Setting England, 1999 and 2000.

Participants Community sample of 27 Kosovan and 12 Bosnian refugees.

Main outcome measures Discrepancies in repeated descriptions of one traumatic and one non-traumatic event, including specific details, rated as central or peripheral to the event. Self report measures of post-traumatic stress disorder and depression.

Results Discrepancies between an individual's accounts were common. For participants with high levels of post-traumatic stress, the number of discrepancies increased with length of time between interviews. More discrepancies occurred in details peripheral to the account than in details that were central to the account.

Conclusion The assumption that inconsistency of recall means that accounts have poor credibility is questionable. Discrepancies are likely to occur in repeated interviews. For refugees showing symptoms of high levels of post-traumatic stress, the length of the application process may also affect the number of discrepancies. Recall of details rated by the interviewee as peripheral to the account is more likely to be inconsistent than recall of details that are central