

Impact of pre-enlistment antisocial behaviour on behavioural outcomes among UK military personnel

Deirdre MacManus · Kimberlie Dean ·
Amy C. Iversen · Lisa Hull · Norman Jones ·
Tom Fahy · Simon Wessely · Nicola T. Fear

Received: 9 March 2011 / Accepted: 12 October 2011
© Springer-Verlag 2011

Abstract

Purpose Concern has been raised over alleged increases in antisocial behaviour by military personnel returning from the deployment in Iraq and Afghanistan. US-based research has shown that post-deployment violence is related not only to combat experience, but also to pre-enlistment antisocial behaviour (ASB). This study aimed to examine the association between pre-enlistment ASB and later behavioural outcomes, including aggression, in a large randomly selected UK military cohort.

Methods Baseline data from a cohort study of 10,272 UK military personnel in service at the time of the Iraq war in 2003 were analysed. The associations between pre-enlistment ASB and a range of socio-demographic and military variables were examined as potential confounders. Logistic regression analyses were performed to examine the relationship between pre-enlistment ASB and military behavioural outcomes such as severe alcohol use, violence/aggression and risk-taking behaviour, controlling for confounders.

Results 18.1% were defined as having displayed pre-enlistment ASB. Pre-enlistment ASB was significantly associated with factors such as younger age, low educational

achievement, male gender, non-officer rank, Army personnel, being a regular, increasing time spent on the deployment and having a combat role. Pre-enlistment ASB was associated with increased risk of negative behavioural outcomes (severe alcohol misuse, outbursts of anger or irritability, fighting or assaultive behaviour and risk-taking behaviour), after controlling for confounders, suggesting that such background information may identify individuals who are more vulnerable to subsequent behavioural disturbance.

Conclusion The results of this study suggest that those already demonstrating ASB prior to joining the military are more likely to continue on this trajectory, thus emphasising the importance of considering pre-enlistment behaviour when exploring the aetiology of aggression in military personnel.

Keywords Military · Deployment · Antisocial behaviour · Aggression · Alcohol misuse

Introduction

Robust research has been published on mental health problems and alcohol misuse among UK military personnel post-deployment [7], but to date there has been no research into the prevalence and correlates of post-deployment antisocial behaviour (ASB). There is growing concern about the effect of military deployments to Iraq and Afghanistan on the psychological well-being of service personnel [7, 11, 15, 20], with particular concern expressed by the media, veteran charities and politicians about perceived increased rates of ASB among troops returning from these deployments [4]. US-based studies have found that military combat exposure is associated with increases in

D. MacManus (✉) · K. Dean · T. Fahy
Department of Forensic and Neurodevelopmental Sciences,
Institute of Psychiatry, King's College London,
PO23, De Crespigny Park, Denmark Hill,
London SE5 8AF, UK
e-mail: deemacmanus@hotmail.com

D. MacManus · A. C. Iversen · L. Hull · N. Jones ·
S. Wessely · N. T. Fear
King's Centre for Military Health Research,
King's College London, Weston Education Centre,
10 Cutcombe Road, London SE5 9RJ, UK

aggression, criminality and risk-taking behaviours [2, 13, 22]. Some studies have also demonstrated that pre-enlistment ASB predicted military ASB as well as or better than combat trauma or wartime experiences [8, 17, 18]. This is important because it is well known that recruitment to the military in both the US and UK is not random, with many recruits coming from socially disadvantaged backgrounds [12]. Iversen et al. [10] have already demonstrated that pre-enlistment vulnerability is an important risk factor for post-deployment ill-health in military personnel, but they did not look at ASB as a post-deployment outcome. The aim of the current study was to examine the association between self-reported pre-enlistment ASB and later adverse behavioural outcomes, including aggression and risk-taking behaviours, in a large randomly selected military cohort.

Methods

Data were obtained from the first phase of a cohort study of UK military personnel [9]. The study sample was a representative sample of personnel who were serving in the UK Armed Forces at the onset of the Iraq war in March 2003. Participants were identified by the UK Ministry of Defence's Defence Analytical Services and Advice (DASA). Special Forces and personnel undertaking security sensitive roles were excluded. Details of the study have been previously described [9]. 10,272 military personnel responded after three mailings and intensive follow-up (61% of the original sample). The main reason for non-response was an inability to contact personnel [10]. There was no evidence of response bias by health outcomes [21]. Of the 10,272 personnel, 4,722 personnel were deployed on the first phase of operations in Iraq, Operation TELIC 1 (UK military term for operations in Iraq), and 5,550 were trained but not deployed to Iraq at that time (termed the 'Era' cohort according to UK military code). All subjects completed a self-report questionnaire. The sample included both regular and reservist personnel. There was interest in exploring outcomes in reservists as particular concerns had been raised about the impact of deployment on reservists in comparison to the regular personnel. As reservists constitute a numerically small proportion of those deployed, this group was oversampled (2:1).

Variables used

All study participants completed a self-report questionnaire between June 2004 and March 2006. The questionnaire collected information on demographics, military service, experiences prior to, during and on deployment, current

health, and pre-military experiences, including childhood adversity [9, 10].

Measures of behavioural outcomes

The following behavioural outcome measures were examined: *Severe alcohol use* was classed as present if an individual scored greater than 16 on the World Health Organization's Alcohol Use Disorders Identification Test, AUDIT [6]; *Risky driving* was assessed as present if an individual sometimes, seldom or never wore a seatbelt or drove more than 10 miles per hour (mph) above the limit in a built up area, or more than 20 mph above the limit on a motorway (adapted from [1]); *Attendance at A&E for fights/assaults in the last 5 years* was ascertained by asking if they had attended A&E in the last 5 years and if so, what for; *Irritability or outbursts of anger in the past month* was rated as moderate-to-severe if the individual reported the above on three or more occasions in the past month.

Exposure variables

Participants were asked to give a true or false response to 16 questions which followed the stem statement 'When I was growing up...' [10]. Participants were defined as having pre-enlistment ASB if they answered *true* to "I used to get into physical fights at school" *plus* one of the following; "I often used to play truant at school" *or* "I was suspended or expelled from school" *or* "I did things that should have got me (or did get me) into trouble with the police". Although these questions do not match precisely diagnostic criteria for conduct disorder, the combination of endorsement of fighting *plus* one other conduct problem was used as a marker of pre-enlistment ASB at a threshold similar to that which would be expected if a formal diagnosis of conduct disorder was made.

Potential confounding factors

Information was gathered on a range of socio-demographic variables, such as age, sex, marital status and level of educational achievement. Information was also gathered on military variables, such as Service, rank, deployment status, length of deployment, and self-reported combat role. Regarding the latter, if personnel had been deployed on Operation TELIC, they were asked whether they had performed a combat role (in direct combat with the enemy), a combat support role (such as combat engineer, signals or artillery), or a combat support service role (such as in the medical services or logistic support).

Statistical analyses

Descriptive analyses of the sample were undertaken and the characteristics of those with and without pre-enlistment ASB were compared using Chi-squared or *t* test analyses wherever appropriate. Associations between demographic and military service variables and pre-enlistment ASB were examined as potential confounders. Logistic regression analyses were performed to examine the relationship between pre-enlistment conduct problems and behavioural outcomes adjusted for confounders [5]. Odds ratios, 95% confidence intervals and two-sided *p* values were obtained. All analyses were adjusted to take account of sampling weights. Analyses were performed using STATA version 10.0.

Results

Characteristics of sample

This sample reflected the structure of the UK Armed Forces in 2003 when the sample was selected. Participants were predominantly male (89.9%), young (76.4% aged under 40) and married or in a long-term relationship (77.0%). Less than half (46%) had achieved higher than GCSE, O levels or the equivalent at school. The majority were in the Army (64%). Most were still serving (76.3%), just under half (46.2%) had been deployed on Operation TELIC 1 and 15.4% were reservists.

Prevalence of pre-enlistment antisocial behaviour

Sixty-six percent of the sample did not report any pre-enlistment ASB; 23.4% reported getting into fights, 18.6% truanted, 15.9% were suspended or expelled from school, 34% did things that should have got them (or did get them) into trouble with the police. Of these, 18.1% were defined as displaying pre-enlistment ASB (fighting plus one (7.0%), two (6.8%) or three (4.8%) of the other pre-enlistment ASBs).

Socio-demographic and military factors associated with pre-enlistment antisocial behaviour

Table 1 shows that pre-enlistment antisocial behaviour was significantly associated with younger age, male gender, low educational achievement, being of non-officer rank, being in the Army, and being a regular (Table 1). An individual with a history of pre-enlistment ASB was no more likely to be deployed than an individual without pre-enlistment ASB but they were more likely to spend longer on the deployment within the previous 3 years and to serve a combat role.

Military behavioural outcomes

Pre-enlistment ASB was strongly associated with: severe alcohol misuse, engaging in risky driving, outbursts of anger or irritability and fighting/violence leading to attendance at A&E. These associations remained following adjustment for confounders (Table 2).

Discussion

In this study, 34% of the sample of UK military personnel reported engaging in an ASB before enlisting in the army; 18.1% reported engaging in fighting plus one other pre-enlistment ASB. We do not have a non-military comparison group, but if we consider that aggression and fighting is estimated to occur in 5% of children and adolescents in Great Britain [14], then 18% of our sample reporting a history of fighting plus another antisocial behaviour appears high. This is likely to be due to the non-random nature of recruitment into the military with many recruits coming from socially disadvantaged backgrounds [12]. Military personnel who reported pre-enlistment ASB were more likely to report ASB while in the military. The risks of severe alcohol misuse, risky driving, fighting or assaultive behaviour, or outbursts of anger or irritability were each more than doubled for personnel with a history of pre-enlistment ASB compared to those without, even after controlling for socio-demographic and military confounders. This implies that those who are displaying ASB prior to entry into the military are more likely to continue this behaviour than those who do not display such behaviour. Research from the general population has already shown that childhood disruptive behaviour has potent effects on ASB and criminality, even into mid-adulthood [16, 19]. However, as this study has not included a general population control group, we cannot comment on the effect the military may have on the predicted behavioural trajectory of those already displaying early ASB.

Research into ASB in military personnel in the US has found that combat experience is associated with increased aggression, criminality and risk-taking behaviour [2, 13, 22]. However, it is vital to determine whether such behaviour is indeed a consequence of military experience or to an underlying propensity for ASB. From a life course perspective, military service may function as a turning point by altering life trajectories in a beneficial or detrimental way. For some, the military is an opportunity for achievement, to escape disadvantaged backgrounds and acquire skills and further education. For others, it may disrupt their life course with negative consequences such as problems with marriages, employment, and increased aggression. For those already on an antisocial path, the military may merely

Table 1 Socio-demographic and military factors associated with pre-enlistment antisocial behaviour, percentages (%) (or mean and 95% confidence intervals for continuous data), missing numbers, odds ratios (OR) and 95% confidence intervals (CI) are presented

Factor	No antisocial behaviour (<i>n</i> = 8,475)	Antisocial behaviour (<i>n</i> = 1,797)	OR (95% CI)	Adjusted ^a OR (95% CI)
Age (years)	34.18 (34.01–34.36)	31.25 (30.90–31.60)	0.95 (0.948–0.961)	0.98 (0.970–0.990)
Educational status (missing for 628)				
No qualifications	61.7	38.3	2.28 (1.93–2.69)	2.28 (1.90–2.72)
O-levels	78.6	21.4	1.0	1.0
A-levels	85.7	14.4	0.62 (0.54–0.70)	0.79 (0.68–0.91)
Degree	92.3	7.7	0.31 (0.25–0.37)	0.68 (0.53–0.87)
Marital status (missing for 36)				
In a relationship	82.4	17.6	1.0	1.0
Single	80.5	19.5	1.13 (0.99–1.31)	0.85 (0.73–1.01)
Separated/divorced/widowed	79.3	20.7	1.23 (1.00–1.51)	1.18 (0.94–1.49)
Sex				
Male	80.6	19.4	1.0	1.0
Female	95.3	4.7	0.21 (0.15–0.28)	0.24 (0.17–0.33)
Serving status (missing for 57)				
Serving	81.7	18.3	1.0	1.0
Left	84.1	15.9	0.84 (0.71–1.00)	0.82 (0.67–1.00)
Rank (missing for 91)				
Officer	94.0	6.0	0.25 (0.21–0.31)	0.41 (0.31–0.53)
NCO	80.1	20.0	1.0	1.0
Other	76.2	23.8	1.25 (1.10–1.42)	1.18 (0.99–1.39)
Service				
Naval service	86.4	13.6	0.55 (0.47–0.64)	0.57 (0.48–0.68)
Army	77.7	22.3	1.0	1.0
RAF	91.8	8.3	0.31 (0.26–0.37)	0.42 (0.34–0.51)
Months deployed in the last 3 years (missing for 367)	7.04 (6.91–7.17)	8.93 (8.64–9.23)	1.05 (1.04–1.06)	1.03 (1.01–1.04)
Engagement type				
Regular	81.3	18.7	1.0	1.0
Reserve	89.1	10.9	0.53 (0.45–0.63)	0.66 (0.54–0.81)
Iraq deployed				
No	84.3	15.7	1.0	1.0
Yes	80.2	19.8	1.32 (1.19–1.47)	0.99 (0.87–1.12)
Role in parent unit (missing for 147)				
Combat	73.7	26.4	1.98 (1.76–2.22)	1.22 (1.07–1.40)
Combat support	84.4	15.6	1.02 (0.86–1.22)	0.94 (0.77–1.14)
Combat service support	84.7	15.3	1.0	1.0

All analyses weighted to take account of sampling weights

^a Adjusted for age, educational status, sex, engagement type, serving status, months deployed in the past 3 years, Service, engagement type, rank and role

provide another setting for the continuation of previous behaviour [3]. The impact of an experience on an individual's behaviour is significantly influenced by their personal characteristics. Fontana and Rosenheck [8], in a large US study of Vietnam veterans, found that post-military ASB reflected a lifetime history of ASB much more than it reflected the “after-effect” of war-zone experience [8].

The demographic factors associated with pre-enlistment ASB were shown to be the same as those in the general population such as male gender, and lower educational achievement. Pre-enlistment ASB was more prevalent in the Army as opposed to the Navy or the Royal Air Force and was also higher in military personnel of non-officer rank compared to those of officer rank. These associations

Table 2 Behavioural outcomes associated with pre-enlistment antisocial behaviour, column percentages (%), missing numbers, odds ratios (OR) and 95% confidence intervals (CI) are presented

Factors	No antisocial behaviour	Antisocial behaviour	OR (95% CI)	Adjusted OR (95% CI) ^a
Severe alcohol misuse (missing for 150)	11.8	30.9	3.33 (2.95–3.77)	2.40 (2.09–2.76)
Attendance at A&E for violence/fights (missing for 15)	0.9	2.6	2.97 (2.04–4.33)	2.01 (1.30–3.09)
Risky driving (missing for 700)	14.9	33.7	2.90 (2.57–3.28)	2.04 (1.77–2.36)
Moderate/severe irritability/outbursts of anger (missing for 14)	9.6	22.0	2.65 (2.31–3.03)	2.23 (1.92–2.60)

All analyses weighted to take account of sampling weights

^a Adjusted for age, educational status, sex, engagement type, serving status, months deployed in the past 3 years, Service, rank and role

are most likely explained by selection bias at recruitment. This is not surprising as the Royal Air Force and Royal Navy are more likely to be better educated and historically many recruits to the Army have come from socially disadvantaged inner city areas where rates of social problems and hence crime are high [12].

Interestingly a pre-enlistment history of ASB was not significantly associated with being deployed to Iraq in this study. However, it was associated with spending on average more time on the deployment in the past 3 years, serving in a combat role and being more likely to discharge a weapon in direct combat. This implies that those with a history of ASB may be more likely to be selected into the infantry which would increase the likelihood that they will be in direct combat situations and thus be more likely to have to discharge a weapon in combat or it may be hypothesised that they may have a lower threshold for violence in the combat situation. However, selection into the UK Armed Forces involves aptitude tests and successful completion of basic training. During basic training, recruits are required to show controlled aggression. Substantial numbers (anecdotally about a third) do not make it past this stage and thus are not recruited into the military. It may seem at first unsurprising that someone with a lower threshold for ASB may be selected into a combat role (there is no formal process of selection for combat roles) but it could also be that better qualified and more adept personnel are selected for other roles.

Strengths and limitations

The current study represents the first exploration of the aetiology of ASB in UK Armed Forces. Our findings demonstrate that pre-enlistment ASB is associated with a range of behavioural problems among military personnel even after adjustment for potential confounders. One of the main limitations of the study was the reliance on self-report measures of behavioural outcomes and pre-enlistment ASB. There is potential for recall bias in this study on the

basis of the potential for differential reporting of pre-enlistment ASB depending on outcome status. The use of ‘attendance at A&E for fighting’ as a measure of violent behaviour is not ideal not only due to the self-report nature but it is also likely to further underestimate the level of violence as it does not capture violent behaviour which does not result in A&E attendance. Another limitation is that we do not have a general population comparison group, so we cannot surmise how study participants’ behaviour may have been had they not joined the military. Given that military service may improve life trajectories, it is possible that the association between early ASB and later negative behavioural outcomes might have been stronger in the general population compared to the military personnel.

Conclusion

The results of this study suggest that a sizeable proportion of those entering the military have a history of early ASB and that this history is associated with the future ASB while in the military even after other socio-demographic and military factors are accounted for. This suggests that many of those already displaying ASB before they enlist in the military may continue on this behavioural trajectory. It must also be noted, however, that we do not know whether or not military service may actually reduce the incidence of ASB. As a proportion of recruits do not pass out of basic training, both the basic training ‘selection process’ and the teaching of controlled aggression may well reduce the potential amount of ASB post-enlistment. Irrespective of this, the results of this study emphasise the importance of considering pre-enlistment ASB when exploring the aetiology of aggression and ASB in military personnel.

Conflict of interest S. Wessely is Honorary Consultant Advisor in Psychiatry to the British Army, a trustee of Combat Stress and partially funded by the South London and Maudsley NHS Foundation Trust/Institute of Psychiatry/National Institute of Health Research Biomedical Research Centre. The UK Ministry of Defence funded

this project. The authors' work was independent of the UK Ministry of Defence, which had no role in the analysis, interpretation or decision to submit this paper. We disclosed the paper to the Ministry of Defence at the point we submitted it for publication.

References

- Bell NS, Amoroso PJ, Yore MM, Smith GS, Jones BH (2000) Self-reported risk-taking behaviors and hospitalization for motor vehicle injury among active duty Army personnel. *Am J Prev Med* 18:85–95
- Black DW, Carney CP, Peloso PM, Woolson RF, Letuchy E, Doebbeling BN (2005) Incarceration and veterans of the first Gulf war. *Mil Med* 170:612–618
- Bouffard LA (2005) The military as a bridging environment in criminal careers: differential outcomes of the military experience. *Armed Forces Soc* 31:273–295
- Caesar E (2010) From hero to zero. *The Sunday Times*. <http://www.timesonline.co.uk/tol/news/uk/article7084032.ece>
- Clayton D, Hills M (1993) *Statistical models in epidemiology*. Oxford University Press, Oxford
- Fear N, Iversen A, Meltzer H, Workman L, Hull L, Greenberg N, Barker C, Browne T, Earnshaw M, Horn O (2007) Patterns of drinking in the UK Armed Forces. *Addiction* 102:1749–1759
- Fear NT, Jones M, Murphy D, Hull L, Iversen AC, Coker B, Machell L, Sundin J, Woodhead C, Jones N, Greenberg N, Landau S, Dandeker C, Rona RJ, Hotopf M, Wessely S (2010) What are the consequences of deployment to Iraq and Afghanistan on the mental health of the UK armed forces? A cohort study. *Lancet* 375:1783–1797
- Fontana A, Rosenheck R (2005) The role of war-zone trauma and PTSD in the etiology of antisocial behavior. *J Nerv Ment Dis* 193:203–209
- Hotopf M, Hull L, Fear NT, Browne T, Horn O, Iversen A, Jones M, Murphy D, Bland D, Earnshaw M, Greenberg N, Hacker Hughes J, Tate AR, Dandeker C, Rona R, Wessely S (2006) The health of UK military personnel who deployed to the 2003 Iraq war: a cohort study. *Lancet* 367:1731–1741
- Iversen A, Fear N, Simonoff E, Hull L, Horn O, Greenberg N, Hotopf M, Rona R, Wessely S (2007) Influence of childhood adversity on health among male UK military personnel. *Br J Psychiatry* 191:506–511
- Iversen A, van Staden L, Hughes J, Browne T, Hull L, Hall J, Greenberg N, Rona R, Hotopf M, Wessely S, Fear N (2009) The prevalence of common mental disorders and PTSD in the UK military: using data from a clinical interview-based study. *BMC Psychiatry* 9:68
- Johnstone J (1978) Social class, social areas and delinquency. *Social Soc Res* 63:49–72
- Killgore WDS, Cotting DI, Thomas JL, Cox AL, McGurk D, Vo AH, Castro CA, Hoge CW (2008) Post-combat invincibility: violent combat experiences are associated with increased risk-taking propensity following deployment. *J Psychiatry Res* 42:1112–1121
- Meltzer H, Gatward R, Goodman R, Ford T (2000) *The mental health of children and adolescents in Great Britain*. Office of National Statistics, London
- Milliken CS, Auchterlonie JL, Hoge CW (2007) Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq war. *JAMA* 298:2141–2148
- Reef J, Diamantopoulou S, van Meurs I, Verhulst F, van der Ende J (2010) Developmental trajectories of child to adolescent externalizing behavior and adult DSM-IV disorder: results of a 24-year longitudinal study. *Soc Psychiatry Psychiatr Epidemiol*. doi:10.1007/s00127-010-0297-9
- Resnick HS, Foy DW, Donahoe CP, Miller EN (1989) Antisocial behavior and post-traumatic stress disorder in Vietnam veterans. *J Clin Psychol* 45:860–866
- Shaw DM, Churchill CM, Noyes R, Loeffelholz PL (1987) Criminal behavior and post-traumatic stress disorder in Vietnam veterans. *Compr Psychiatry* 28:403–411
- Simonoff E, Elander J, Holmshaw J, Pickles A, Murray R, Rutter M (2004) Predictors of antisocial personality: continuities from childhood to adult life. *Br J Psychiatry* 184:118–127
- Smith TC, Ryan MAK, Wingard DL, Slymen DJ, Sallis JF, Kritz-Silverstein D (2008) New onset and persistent symptoms of post-traumatic stress disorder self reported after deployment and combat exposures: prospective population based US military cohort study. *BMJ* 336:366–371
- Tate AR, Jones M, Hull L, Fear N, Rona R, Wessely S, Hotopf M (2007) How many mailouts? Could attempts to increase the response rate in the Iraq war cohort study be counterproductive? *BMC Med Res Methodol* 7:51
- Yager T, Laufer R, Gallops M (1984) Some Problems Associated With War Experience in Men of the Vietnam Generation. *Arch Gen Psychiatry* 41:327–333