

WHAT IS ALREADY KNOWN ON THIS TOPIC

Familial hypercholesterolaemia is an autosomal dominant disorder affecting about two per 1000 people

The disorder results in a high mortality from coronary heart disease

Lowering serum cholesterol reduces risk substantially, but there is no accepted strategy for population screening

WHAT THIS STUDY ADDS

Screening by measurement of serum cholesterol is most effective if done in early childhood after the first year of life; between ages 1 and 9 years, an estimated 88% of affected children would be identified with a false positive rate of 0.1%

For every affected child there would be one affected parent, identifiable as the one with the higher serum cholesterol concentration

Such a proposed child-parent screening strategy has the potential to prevent the medical consequences of this disorder in two generations simultaneously

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Mental health consequences of overstretch in the UK armed forces: first phase of a cohort study

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EDITORIAL by Ursano and colleagues

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ABSTRACT

Objective To assess the relation between frequency and duration of deployment of UK armed forces personnel on mental health.

Design First phase of a cohort study.

Setting UK armed forces personnel.

Participants Operational history in past three years of a randomly chosen stratified sample of 5547 regulars with experience of deployment.

Main outcome measures Psychological distress (general health questionnaire-12), caseness for post-traumatic stress disorder, physical symptoms, and alcohol use (alcohol use disorders identification test).

Results Personnel who were deployed for 13 months or more in the past three years were more likely to fulfil the criteria for post-traumatic stress disorder (odds ratio 1.55, 95% confidence interval 1.07 to 2.32), show caseness on the general health questionnaire (1.35, 1.10 to 1.63), and have multiple physical symptoms (1.49, 1.19 to 1.87). A significant association was found between duration of deployment and severe alcohol problems. Exposure to combat partly accounted for these associations. The associations between number of deployments in the past three years and mental disorders were less consistent than those related to duration of deployment. Post-traumatic stress disorder was also associated with a mismatch between expectations about the duration of deployment and the reality.

Conclusions A clear and explicit policy on the duration of each deployment of armed forces personnel may reduce

the risk of post-traumatic stress disorder. An association was found between deployment for more than a year in the past three years and mental health that might be explained by exposure to combat.

INTRODUCTION

British commanders have raised concerns about the ability of the armed forces to cope with simultaneous major operations in Iraq and Afghanistan, and the UK armed forces have been asked to do more than was envisaged in the most recent defence review.¹⁻³ The UK armed forces acknowledge that excessive deployments may affect job satisfaction and have recommended maximum deployment levels, called harmony guidelines.

The pace of military operations, "operational tempo," may have an effect on health, place strain on families, lower morale, and influence intentions to remain in the armed forces.⁴⁻⁶ Overstretch is conceived as over-committing the armed forces at a time of simultaneous major deployments. Thus it should be associated with operational tempo. Although deployment is considered a valuable feature of a military career it can also be a source of conflict and tension within families and may have consequences on mental health.^{4,5}

We assessed the relations between operational tempo and psychological health in the context of the harmony guidelines.⁷ We also studied the associations between operational tempo and problems at home.

METHODS

This study is based on the first phase of a cohort study of UK armed forces personnel. We stratified samples by service and enlistment type (regular or reserve). Operation Telic is the codename for the current operations in Iraq. Full details of the study can be found elsewhere.⁸ In total 4722 personnel who were deployed on Telic 1 (fighting phase) and 5550 personnel who were not completed a questionnaire on experiences of the armed forces, deployment, and post-deployment and on health outcomes. The study sample was 5547 regulars (see bmj.com for exclusions). Most of the participants (98.5%) completed the questionnaire after deployment.

Outcome measures, main independent factors, confounders, and explanatory variables

We measured psychological distress (general health questionnaire-12), post-traumatic stress disorder, fatigue, physical symptoms, and alcohol use (see bmj.com for cut-off values for each measure). Other outcomes were intentions to stay in the armed forces and problems at home during or after deployment.

We asked participants how many months in the past three years they had been away on deployment. Number of deployments was any to Afghanistan, Bosnia, Kosovo, Macedonia, northern or southern Iraq and Kuwait, and Sierra Leone. We also created a category for participants deployed above the harmony guidelines. Based on the army guideline for a unit (six months' operational tour with 24 months' interval) during 36 months, a unit could not be deployed for more than 12 months. We subdivided the remaining deployment periods into three categories of equal duration. In a separate analysis we assessed the difference between actual and expected time in theatre on

the last deployment (same as expected, less than expected, more than expected).

Analyses were adjusted for age, sex, serving status, marital status, and service. We further adjusted for role in theatre (combat, combat support, combat service support), type of deployment (war in at least one deployment, peace enforcement), time spent in a forward area in close contact with the enemy (not at all, up to a week, up to a month, more than a month), and problems at home during and after deployment, collected for the last deployment.

Analysis

We carried out multiple logistic regressions for the sample regardless of service but adjusted for it. We also carried out analyses separately for each service. Two models were used to analyse the outcomes. In the first we adjusted for potential confounders and in the second we further adjusted for possible explanatory variables. We analysed the duration and number of deployments and the difference between expected and actual duration for the last deployment. We assessed the odds ratios and 95% confidence intervals for each group compared with the reference group. We also assessed other effects associated with deployment.

RESULTS

Overall 5547 (63.9%) of 8686 regulars who completed the questionnaire had been deployed at least once in the past three years. Royal Air Force personnel had less prolonged periods of deployments than the other personnel, whereas the naval services had proportionally more personnel with long periods of deployment (see bmj.com). Most of those deployed had one or two deployments in the past three years. Almost a third of those with a combat role in their last deployment had

Table 1 | Prevalence and association between duration and number of deployments since 2000, for about a three year period, and psychological symptoms, adjusted for confounders and explanatory factors (n=5547)

Variables	Post-traumatic stress disorder			Psychological distress case			Multiple physical symptoms			Severe alcohol problems		
	No (%)	Odds ratio (95% CI)*	Odds ratio (95%CI)†	No (%)	Odds ratio (95% CI)*	Odds ratio (95%CI)†	No (%)	Odds ratio (95% CI)*	Odds ratio (95%CI)†	No (%)	Odds ratio (95% CI)*	Odds ratio (95%CI)†
Duration of deployment (months):												
<5	26 (3.0)	1.00 (0.61 to 1.64)	1.13 (0.67 to 1.92)	169 (19.1)	1.12 (0.90 to 1.38)	1.15 (0.91 to 1.45)	88 (9.8)	0.93 (0.71 to 1.22)	0.97 (0.72 to 1.31)	96 (10.9)	0.70 (0.54 to 0.91)	0.66 (0.50 to 0.88)
5-8	55 (3.1)	1.00	1.00	308 (17.3)	1.00	1.00	192 (10.6)	1.00	1.00	298 (16.7)	1.00	1.00
9-12	60 (3.8)	1.10 (0.75 to 1.61)	0.96 (0.63 to 1.45)	308 (19.2)	1.10 (0.92 to 1.31)	1.00 (0.82 to 1.22)	173 (10.6)	0.97 (0.78 to 1.21)	0.88 (0.69 to 1.12)	305 (19.0)	1.02 (0.85 to 1.23)	0.99 (0.82 to 1.21)
≥13	62 (5.2)	1.58 (1.07 to 2.32)	1.24 (0.81 to 1.89)	257 (21.8)	1.35 (1.10 to 1.63)	1.17 (0.94 to 1.44)	175 (14.5)	1.49 (1.19 to 1.87)	1.28 (0.99 to 1.64)	285 (23.9)	1.35 (1.11 to 1.64)	1.18 (0.95 to 1.46)
No of deployments:												
1	121 (3.8)	1.00	1.00	616 (18.8)	1.00	1.00	345 (10.3)	1.00	1.00	592 (18.1)	1.00	1.00
2	57 (3.4)	0.93 (0.67 to 1.30)	0.85 (0.59 to 1.22)	320 (19.2)	1.05 (0.90 to 1.23)	1.02 (0.86 to 1.21)	219 (13.0)	1.25 (1.04 to 1.51)	1.17 (0.96 to 1.44)	301 (18.0)	1.10 (0.93 to 1.29)	1.10 (0.92 to 1.31)
≥3	25 (4.9)	1.49 (0.94 to 2.37)	1.32 (0.79 to 2.19)	106 (21.0)	1.27 (1.00 to 1.61)	1.15 (0.89 to 1.50)	64 (12.3)	1.29 (0.97 to 1.73)	1.20 (0.88 to 1.65)	91 (17.7)	1.23 (0.95 to 1.59)	1.28 (0.97 to 1.68)

*Adjusted for age, sex, serving status, rank, marital status, and service.

†Adjusted for age, sex, serving status, rank, marital status, service, role in theatre, time spent in a forward area, problems at home, and type of deployment.

been deployed for 13 months or more in the past three years.

A consistent association was found between prolonged deployments (≥ 13 months) and problems at home during and after deployment (see [bmj.com](#)). The effect size was, however, small and was reduced after adjustment for role in theatre, time spent in a forward area, and type of deployment (see [bmj.com](#)). No association was found between number of deployments and problems at home.

The prevalence of all psychological symptoms was higher among those with prolonged deployments (table 1). This was shown by a consistent association between duration of deployment (category ≥ 13 months) and psychological symptoms when adjusted for confounders. The prevalence of severe alcohol problems increased with duration of deployment (P for trend < 0.001). Role in theatre, time spent in a forward area, type of deployment, and problems at home partly explained the associations in relation to the post-traumatic stress disorder checklist, psychological distress, and, to a lesser extent, multiple physical symptoms. No single variable explained the decrease of association between deployment for 13 months or more and psychological symptoms. This association was also observed for fatigue but became non-significant after adjustment for problems at home, time spent in a forward area, type of deployment, and role in theatre (data not shown).

The relation between number of deployments and prevalence of psychological symptoms was less clear

(table 1). An association was found between those with three or more deployments and caseness ($P=0.05$), but this became non-significant after adjustment for explanatory factors (table 1). Some evidence was found for an association between number of deployments and post-traumatic stress disorder and multiple physical symptoms, but the associations were non-significant ($P>0.05$).

Effect modifications were not found for deployment and type of service on each of the psychological outcomes. The results for the Royal Navy and for the army plus the Royal Marines were generally consistent with those for all three services, but this was not so for the Royal Air Force (data not shown). In the Royal Air Force, the group with three or more deployments was associated with caseness for post-traumatic stress disorder and psychological distress (associations were of borderline statistical significance). The association decreased after adjustment for the explanatory variables.

A moderately strong association was found between a longer than expected deployment and caseness on the post-traumatic stress disorder checklist, which was not found for the other psychological outcomes (table 2). The association between longer than expected deployment and post-traumatic stress disorder persisted in analyses carried out for the Royal Navy (odds ratio 12.34, 95% confidence interval 1.02 to 148.73) and for the Army plus the Royal Marines (2.18, 1.09 to 4.36).

DISCUSSION

Deployment for 13 months or more over a three year period was consistently associated with problems at home during and after deployment (effect sizes small) and with psychological symptoms (effect sizes moderate). A combat role during deployment, type of deployment, time spent in a forward area, and problems at home partly explained these associations. The associations were less consistent for number of deployments. A noticeable association was found between an expectation that the most recent deployment would be shorter than it was and post-traumatic stress disorder. This association (effect sizes were moderately large) was also observed separately for the Royal Navy and in the army plus Royal Marines.

Data quality

Although information bias cannot be excluded it was unlikely because the main independent variables were objective and participants were not specifically informed about the use of the data to assess the effect of "operational tempo," the pace of military operations. Omission of information or forgetfulness could have affected responses but this should not have been a major problem in a three year period. Reverse causality is an unlikely explanation for the association between duration of deployment and psychological symptoms. It is unlikely that personnel with psychological symptoms would be deployed when their unit was not or that commanding officers would deploy

Table 2 | Association between difference of expected and actual duration of last deployment and psychological symptoms

Variables	No (%)	Odds ratio (95% CI)*	Odds ratio (95% CI)†
Caseness on post-traumatic stress disorder checklist			
Duration of deployment:			
Same as expected	29 (2.7)	1.00	1.00
Less than expected	48 (3.1)	1.04 (0.64 to 1.76)	1.10 (0.66 to 1.84)
More than expected	17 (6.4)	2.27 (1.21 to 4.24)	2.38 (1.21 to 4.65)
Caseness on general health questionnaire			
Duration of deployment:			
Same as expected	177 (16.5)	1.00	1.00
Less than expected	269 (17.4)	1.06 (0.86 to 1.31)	1.13 (0.89 to 1.42)
More than expected	57 (21.4)	1.34 (0.95 to 1.88)	1.30 (0.90 to 1.89)
Multiple physical symptoms			
Duration of deployment:			
Same as expected	103 (9.5)	1.00	1.00
Less than expected	183 (11.8)	1.25 (0.96 to 1.62)	1.27 (0.96 to 1.68)
More than expected	22 (8.1)	0.82 (0.51 to 1.34)	0.82 (0.49 to 1.36)
Severe alcohol problem			
Duration of deployment:			
Same as expected	177 (16.5)	1.00	1.00
Less than expected	266 (17.2)	1.03 (0.87 to 1.28)	1.02 (0.81 to 1.29)
More than expected	52 (19.3)	1.11 (0.77 to 1.59)	1.11 (0.76 to 1.62)

*Adjusted for sex, age, serving status, rank, service, and marital status.

†Adjusted for sex, age, serving status, rank, service, marital status, role in theatre, time spent in a forward area, and problems at home.

WHAT IS ALREADY KNOWN ON THIS TOPIC

UK armed forces are being deployed more often than previously, so called overstretch. To allow objective monitoring the UK armed forces have recommended maximum deployment levels, called harmony guidelines.

WHAT THIS STUDY ADDS

Duration of deployment above established guidelines is associated with more mental health problems.

Combat exposure, type of deployment, and problems at home partly account for these associations.

An association was found between expectation that duration of most recent deployment would be shorter than it actually was and post-traumatic stress disorder.

personnel with psychological symptoms more often than others. If anything the opposite would be more likely. We cannot exclude reverse causality when assessing the difference between expected and actual duration of deployment and post-traumatic stress disorder. We believe that the specificity and consistency of the finding in contrast with other psychological symptoms studied supports the view that this may be causal.

We do not have data on psychological symptoms before deployment. Such information would have been helpful to ensure that reverse causality could not have explained the association between expected and actual duration of deployment and post-traumatic stress disorder. The assessment of psychological symptoms before deployment would have been less helpful in the analysis of duration of deployment over the past three years because there was great variation in the number of operations in which personnel participated.

In the harmony guidelines the definition of excessive deployment in the army does not correspond to that for the naval services and Royal Air Force. The only reasonable analytical approach was to use one definition for participants regardless of service. As we did not have independent information on the intensity of combat such information was provided by the participants. We were not able to identify a precise traumatic exposure related to post-traumatic stress disorder.

Duration and number of deployments and mental health

Duration of deployment over a long period, such as the three years in this study, is an important construct because it is nearer to the concepts of “overstretch” in a period of multiple deployments. Overstretch conveys the notion that smaller forces are carrying out an increasing number of operational duties worldwide.⁹ The harmony guidelines provide a measure of overstretch. We found evidence that deployment above this limit has some adverse psychological consequences. With the exception of severe alcohol problems a threshold of deployment duration exists beyond which psychological health deteriorates.

Type of deployment, time spent in a forward area, and problems at home both during and after

deployment reduce the level of the associations between duration of deployment and psychological outcomes.

Duration of deployment may be a factor in the high alcohol intake of military personnel. In contrast with other outcomes of psychological health, the risk of alcohol misuse increased with increasing duration of deployment.

The association between number of deployments and psychological symptoms was less consistent than for duration of deployment. One study proposed that successive deployments could have a stress buffering effect; thus an initial deployment could decrease the likelihood of psychological symptoms in subsequent deployments.¹⁰ We did not find evidence in support of such a hypothesis.

Conclusions

Adherence to a clear and explicit policy on duration of deployments may have beneficial effects on mental health. Overstretch in the UK armed forces may have consequences on problems at home, and deterioration of psychological health may be more apparent in those exposed to combat.

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Competing interests: SW is honorary civilian consultant adviser to the British army. NG and ME are members of the Defence Medical Services seconded to King's College London. Although NG and ME are paid from Ministry of Defence funds they have not been directed in any way by the ministry in relation to this publication.

Ethical approval: This study was approved by the Ministry of Defence (Navy) personnel research ethics committee and the King's College Hospital local research ethics committee.

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BMJ updates

Second generation antidepressants should remain an option for children and adolescents with depression or anxiety

Research question

Are second generation antidepressants associated with suicidal ideation or suicide attempts in children and adolescents with depression or anxiety?

Answer

Yes, but the risk is small and statistically non-significant. In general, the benefits of these agents outweigh the risks.

Why did the authors do the study?

Second generation antidepressants have been linked to an increased risk of suicidal ideation or even suicide attempts among children and adolescents with depression or anxiety. These authors wanted to clarify and update existing data about the potential dangers of these drugs.

What did they do?

They searched systematically for all published and unpublished randomised, placebo controlled trials testing second generation antidepressants in children with major depression or anxiety disorders, including obsessive-compulsive disorder. They searched research databases, trial registers, reports from British and US regulatory agencies, and the proceedings of the two leading psychiatric associations in the US. They also hand searched reference lists and contacted leading researchers.

The authors pooled the results of 27 trials in a meta-analysis, looking specifically at benefits (a treatment response) and risks (suicidal ideation or suicide attempt). They assessed each trial's quality using a validated method; looked for heterogeneity among trials and adjusted for it in their analysis; and looked for publication bias, but didn't find any. All trial participants were under 19 years old. The trials tested selective serotonin reuptake inhibitors, venlafaxine, nefazodone, and mirtazapine.

What did they find?

The benefits of treatment outweighed the risks of suicidal ideation or suicide attempt for children with major depression, obsessive-compulsive disorder, or other

anxiety disorders. Treatment was most effective for those with other anxiety disorders (response rates 69% for treatment group v 39% for placebo group, pooled risk difference 37% (95% CI 23% to 52%)), least effective for those with major depression (61% v 50%, 11% (7% to 15%)), and in between for those with obsessive-compulsive disorder (52% v 32%, 20% (13% to 20%)).

Overall, the absolute risk of suicidal ideation or suicide attempt was 0.7% (0.1% to 1.3%) higher among participants treated with antidepressants, but the increase became non-significant when each disorder was analysed separately. The risk of harm looked highest for children and adolescents with major depression. Three per cent of the treated group (54/1832) and 2% of the placebo group (26/1553) had suicidal ideation or attempt (risk difference 1% (95% CI -0.1% to 2.0%), $P=0.08$), giving a number needed to harm of 112.

In subgroup analyses, antidepressants seemed to work better for adolescents than for younger children. There were no suicides in any trial.

What does it mean?

The risks reported in this analysis are lower than those given in an earlier analysis by the US Food and Drug Administration, which reported a significant twofold increase in rates of suicidal ideation or attempts (from 2% to 4%) associated with second generation antidepressants. Different analytical techniques and the data from seven additional trials could explain the discrepancy.

The authors say doctors should discuss these findings with families choosing treatment options, but conclude that second generation antidepressants should remain a treatment option, particularly for children and adolescents with anxiety disorders. Close monitoring is essential for all young people taking these drugs.

Bridge et al. Clinical response and risk for reported suicidal ideation and suicide attempts in pediatric antidepressant treatment. *JAMA* 2007;297:1683-96

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