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Frequency of Mild Traumatic Brain Injury in Iraq and Afghanistan: Are We Measuring Incidence or Prevalence?

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Objective: Rates of mild traumatic brain injury (mTBI) differ considerably between US and UK forces, despite similar methodology and similar exposure risks. We assessed, in the UK forces, if the differences in rates based on last deployment can be explained by differences in deployment length, given that US forces deploy for approximately twice as long as UK forces. **Participants:** A total of 3763 personnel deployed to Iraq or Afghanistan who completed a questionnaire between 2007 and 2009. **Main Outcome Measures:** Mild traumatic brain injury in the last deployment contrasted to current posttraumatic stress disorder, psychological distress (General Health Questionnaire-12), multiple physical symptoms, and alcohol misuse. **Results:** In the Army and Royal Marines, there was an association between length of deployment (per month) and mTBI (odds ratio: 1.31, 95% confidence interval: 1.13–1.51), which remained significant after adjustment for confounders (odds ratio: 1.25, 95% confidence interval: 1.08–1.45). No other outcome was associated with length of deployment. Results based on the total sample were similar to those in the Royal Marine and Army sample, except for adjusted multiple physical symptoms. **Conclusions:** Comparisons of mTBI rates should take account of length of deployment when based on last deployment. Doing so reduces but does not eliminate the differences between UK and US forces. **Keywords:** *incidence*, *length deployment*, *mild traumatic brain injury*, *prevalence*

MILD TRAUMATIC BRAIN INJURY (mTBI) is usually reported in terms of prevalence in military studies and it varies from 4.4% to 23%.[1–5] Prevalence may be construed as appropriate when a cross-sectional design is used, whereas estimates of incidence require a longitudinal design in which the difference between the frequencies at follow up minus the frequency at baseline would provide an incidence estimate. However, the situation is not straightforward when participants are asked specifically about their last deployment in a single survey.

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The use of prevalence instead of incidence matters, because the planning consequences in terms of demand for services may be different and the nature of the estimate used when making comparisons of the frequency of mTBI across studies may be based on different methodologies. The distinction is also important in analytical inference regarding the consequences of mTBI for subsequent postconcussion symptoms (PCS) because we may be investigating mTBI (the independent variable) in terms of incidence but assessing PCS (the dependent variable) in terms of prevalence, thus rendering the analysis insensitive.

Another issue is that mTBI is an event rather than a condition such as posttraumatic stress disorder (PTSD), depression, and anxiety. Nevertheless, care should be exercised in the comparisons between studies of relative frequency of mTBI because some studies may assess mTBI in relation to all deployments, while others may include only the latest deployment. The first estimate will be a function of the number of deployments of each individual–thus clearly a prevalence rate–while the second estimate will be the function of only 1 deployment and can be construed an incidence rate.

In our UK study, we assessed mTBI specifically related to the most recent deployment to Iraq or Afghanistan and the questions appeared in separate sections related

to events during the last deployment to either country.[3] Therefore, estimates based on this assessment cannot be considered as prevalence, but it is also unclear that it is an incidence rate because the study is cross-sectional. All other mental health conditions (including PCS) were assessed in the health section of the questionnaire, which refers to the past 4 weeks, because the conditions could have started before deployment these should be considered prevalence estimates. Others have also assessed mTBI during the most recent deployment,[1,5,6] but some have explored mTBI in any Operation Enduring Freedom and Operation Iraqi Freedom deployments or have not specified whether the response refers to a single deployment.[2,4] The ambiguity about the precise frequency being estimated is compounded by the fact that the original brief traumatic brain injury screen (BTBIS) explores mTBI during a specific deployment,[7] but some other BTBIS versions include mTBI in any deployment.[8]

One way to distinguish whether we are estimating incidence or prevalence of mTBI in our military studies would be to assess the relative frequency of the condition according to length of last deployment to Iraq or Afghanistan. If the question refers to mTBI in a single deployment, the number of cases of the condition at time 0 (just before deployment started) should be 0 (Figure 1 a). Thus, incidence should be a function of length of deployment, because the period of deployment should be an important exposure factor for mTBI. Likewise an association between length of deployment and PTSD is also possible, because the proportion of new cases due to deployment to the total of current cases could be high (Figure 1 b), although in UK military studies differences in the relative frequency of PTSD between deployed and nondeployed personnel have not been found, except in reservists.[9–11] The frequency of psychological distress, multiple physical symptoms (MPS) including PCS and alcohol misuse should be less affected by length of deployment (Figure 1 c), because the prevalences of these 3 conditions are high regardless of deployment status. It is, therefore, worth evaluating the impact of length of a single deployment in these 3 conditions as well as mTBI and PTSD.

Although the usual length of deployment in Afghanistan and Iraq of the UK Army and Royal Marines (RMs) is 6 months, there is a wide range from less than 1 month to more than 8 months. The same variation exists in the Royal Air Force (RAF) and the Royal Navy (RN), although overall policies on tour length differ.

The aim of this study is to compare the association of length of last deployment with the frequency of mTBI and contrast this to the association of length of deployment with the frequency of PTSD, psychological distress, MPS, and alcohol misuse. We expect to infer from this analysis whether our estimates of mTBI are more likely to correspond to incidence in comparison with the other outcomes. If an association between mTBI and length of deployment was shown, an estimate of mTBI based on person-years, which accounts for length of deployment, would be calculated.

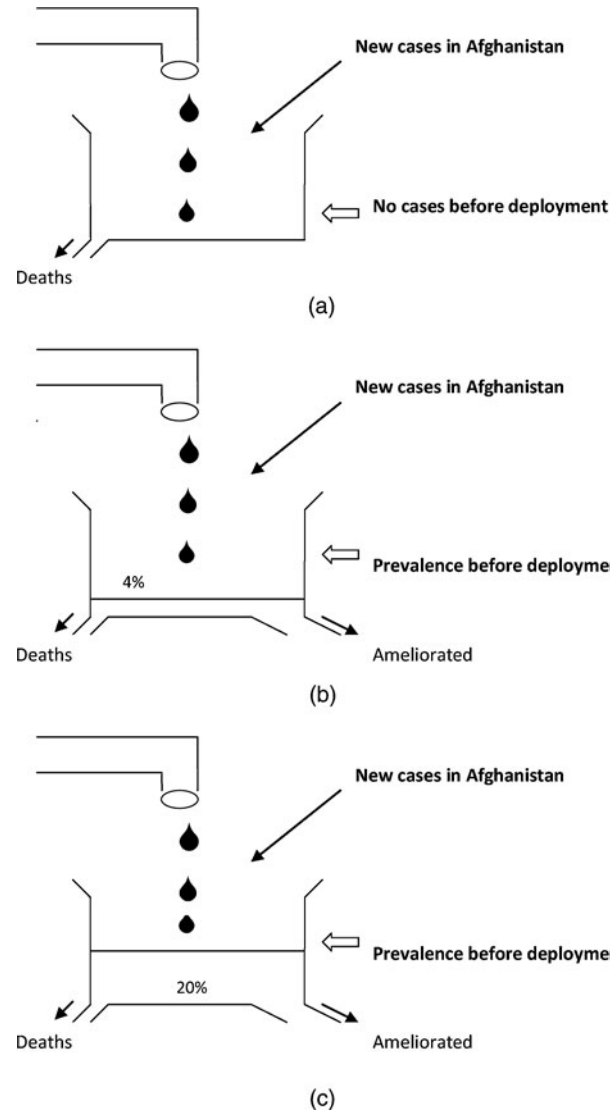

Figure 1. Incidence and prevalence of mild traumatic brain injury, posttraumatic stress disorder, General Health Questionnaire-12 caseness, multiple physical symptoms caseness, and alcohol misuse. (a) Mild traumatic brain injury during last deployment. (b) Current posttraumatic stress disorder. (c) Current General Health Questionnaire-12, Alcohol Use Disorders Identification Test, or multiple physical symptoms.

METHODS

Sample

In 2004, we established a cohort study to assess the mental and physical health of UK armed forces

(phase 1).[11] The study included a random sample of personnel deployed to Iraq in 2003 and another randomly selected group of those who were in the military but had not deployed to Iraq at that time. Between November 2007 and September 2009, we recontacted those who completed the questionnaire in phase 1 and who gave permission for future contact (phase 2).

Another 2 samples were added at phase 2: (1) a random sample of those deployed to Afghanistan between April 2006 and April 2007 to ensure sufficient statistical power to explore specific health issues related to deployment to Afghanistan, and (2) a random sample of personnel who had joined the UK armed forces after the start of the phase 1 study and had completed training between April 2003 and April 2007 and could, therefore, have deployed to Iraq or Afghanistan by phase 2. This sample was added to ensure that the demographic characteristics of the study continued to reflect the current composition of the UK armed forces at the time of sampling in 2007. Regulars and reserves, both serving and those who had subsequently left the services, were included in the study. Further details on sampling and response rates are available elsewhere.[10] Only those who have deployed to Iraq or Afghanistan are included in the analysis reported here, because questions concerning mTBI were only included in the sections related to these deployments.The response rate of the total sample was 56% ($N = 9984$), but the response rate of the deployed group cannot be estimated separately because we do not know if nonresponders were deployed or not. Responders were more likely to be older, females, officers, regulars, and those who participated in the first phase of the study. We have shown no association between responding at phase 2 and baseline mental health outcomes.[11] Of 9984 service personnel, 4980 had deployed to Iraq and/or Afghanistan. However, 1058 of these 4980 were excluded from these analyses because they deployed to both countries, so it was not possible to relate their exposure time to 1 deployment only. A further 159 service personnel did not have a recorded length of deployment or the reported length of deployment was implausible. Although 3763 were available for analysis, incomplete information for some outcomes reduced the number, being lowest for MPS ($n = 3474$) and highest for PTSD ($n = 3725$). In summary, the exclusions for this analysis were 5004 participants who did not deploy to Iraq or Afghanistan; 1058 participants who were deployed to both; and 159 participants who did not provide information on length of deployment.

Measures

The information obtained at phase 2 was collected via a questionnaire, which asked about a participant's last deployment in Iraq and/or Afghanistan. Possible mTBI was assessed using a modified version of the BTBIS, which included an item exploring possible causes of injury (blast, shrapnel fragments, bullet, fall, and vehicle accident and other).[7] Participants could state that they had not suffered an injury during deployment. A second item asked about possible symptoms associated with the injury. These were losing consciousness; being dazed or confused; not remembering the injury; concussion (eg, headache, dizziness); head injury; and none of these. Participants were asked to tick all that applied. Self-report of the duration of any loss of consciousness was also obtained, we eliminated 1 participant from the analysis who reported prolonged loss of consciousness (which would be classified traumatic brain injury, not mTBI). Participants who endorsed at least one of these symptoms were classified as having mTBI. The questions to assess mTBI were restricted to the period of deployment and would probably correspond to incidence with the proviso that it is based on cross-sectional data instead of the usual follow-up design.

We assessed PTSD, using as threshold a score of 50 or more on the PTSDs checklist.[12] Symptoms of common mental disorder were measured by the General Health Questionnaire-12 using a score of 4 or more for caseness.[13] Alcohol misuse was measured by the Alcohol Use Disorders Identification Test using a score of 16 or more to define alcohol misuse.[14] For MPS experienced in the last month, we used a threshold of 18 or more symptoms to define caseness.[15] Although each of these measures assesses recent symptoms, they do not distinguish new and old cases so they should properly be considered prevalence rates.

Length of deployment was obtained from a single question "How long did you deploy?" in months and weeks. If this was uninformative, we looked at self-reported entry and exit dates to theatre to minimize losses. Information was also available on age, gender, level of educational attainment, marital status, service, type of engagement (regular or reserve), location of deployment (Iraq only or Afghanistan only), and rank (commissioned officer, noncommissioned officer, and other ranks). We collected data on role during deployment (combat, noncombat: eg, logistics, engineers), but this variable was not used in the analysis as it is a main exposure factor, which might have attenuated the effect of length of deployment.

Analysis

All analyses were weighted to take account of sampling fractions and response rate differences.[10] Sample weights reflected the inverse probability of a subject from a specific subpopulation and specific engagement type (regular or reserve) being sampled. Response weights were generated to account for nonresponse,

defined as the inverse probability of responding according to gender, rank, engagement type, age, sample, and the interaction between sample and engagement type. The assumption underpinning the weighted analysis was that data are missing at random and that the observed variables modelled to drive nonresponse were correctly identified. Reported percentages may not correspond to the numerators and denominators shown because of the weighted analyses. Because the items concerning mTBI were only included in the extensive deployment sections of the phase 2 questionnaire completed by those deployed to Iraq or Afghanistan, the denominator for the current article is only those deployed to either Iraq or Afghanistan but not to both. This approach was similar to the analytic strategy used in the US studies on mTBI.[1]

The main analyses were carried out separately for each outcome: mTBI, PTSD, MPS, psychological distress, and alcohol misuse. First, odds ratios were calculated for the association with length of deployment as a continuous variable; second, adjusted odds ratios were calculated for length of deployment adjusted for sociodemographic factors and service factors. The same analyses were carried out excluding RN and RAF, because it could be construed that the chance of mTBI related to deployment, mainly blast exposure, may be lower than for the RMs and Army. We considered the main analysis to be the assessment in the RMs and Army only ($N = 2910$), because they have similar pattern of deployment and would be more exposed to blasts than members of the RN and the RAF. All analyses were carried out in STATA 11 (Stata Corporation, College Station, Texas) using survey commands as appropriate.

When individuals contribute to a variable for a varying period of time, person-years are a convenient way to assess rates in prospective studies. Although this analysis is cross-sectional, length of deployment could be construed as a variable reflecting varying periods of observation. Person-years were calculated as the number of mTBI cases divided by the sum of total years of deployment as reported by each participant in the questionnaire.

The study received ethical approval from the Ministry of Defence's research ethics committee and King's College Hospital local research ethics committee.

RESULTS

The percentage of males, combat personnel, Army personnel, and persons with low level of education increased with length of deployment, but the percentage of officers decreased (Table 1). There was less consistency by length of deployment for marital status and regular or reserve statuses. The relative frequency of all mental health outcomes tended to increase with length of deployment. For mTBI, the increase occurred in those with 5 or more months of deployment (weighted test for trend, $P < .0001$), psychological distress ($P < .066$), alcohol misuse ($P < .002$), and MPS tended to increase across the full range of deployment lengths ($P < .008$), while for PTSD there was not a clear pattern ($P < .124$).

In the unadjusted logistic analysis restricted to the RM and Army, the relative frequency of mTBI was positively and significantly associated only with mTBI outcome (Table 2). The relative frequency of mTBI continued to be associated with length of deployment after adjustment for demographic and service variables. The effect size of the association between length of deployment and mTBI is moderate, considering that the unit of measurement for length of deployment was short–1 month. A quadratic term for length of deployment was added to the analysis, but it was nonsignificant for any of the outcomes.

We repeated the analysis including all services and the results did not change, except that an association between relative frequency and length of deployment was observed for the MPS outcome. This association remained significant in the adjusted model, but the effect size was smaller than for mTBI.

As we have shown an increase in the relative frequency of mTBI with length of deployment, we estimated its relative frequency in terms of 100 person-years, that is, taking into account the length of deployment. We found that the relative frequency of mTBI in the RMs and Army was 10.2 (95% confidence interval [CI]: 9.3–11.1) per 100 person-years and in the total sample 9.0 (95% CI: 8.3–9.8) per 100 person-years.

DISCUSSION

This study demonstrates that it is important to take into account length of deployment when estimating the relative frequency of mTBI. There was a consistent association between the length of deployment and the relative frequency of mTBI regardless of whether the analysis was restricted to RMs and Army only or included all services and regardless of the level of adjustment. Such an association neither was present for PTSD, psychological distress, and alcohol misuse, nor was it consistently present for MPS.

Interpretation of the findings

Length of deployment should be taken into account when making comparisons of the relative frequency of mTBI between and among armed forces, especially when troops from different armed forces deploy for different lengths of time. In a previous article, we provided the prevalence of mTBI as 4.4% for the total sample and 5.2% for the RMs and Army sample.[3] We would suggest

TABLE 1 *Demographic and service characteristics and mental health outcomes distribution according to length of deployment*

	Length of deployment (months), *N* (%)						
	<2, *N* = 247	**2.0–3.9, *N* = 695**	**4.0–4.9, *N* = 583**	**5.0–5.9, *N* = 345**	**6.0–6.9, *N* = 1305**	**≥7.0, *N* = 588**	**Total, *N* = 3763**
Sex							
Male	217 (89.75)	602 (88.59)	506 (88.46)	315 (92.84)	1214 (94.19)	555 (95.57)	3409 (92.10)
Age							
< = 29 years	94 (34.31)	265 (36.07)	251 (40.54)	153 (39.16)	653 (44.85)	311 (48.72)	1727 (42.10)
Education							
No or ordinary level qualifications	82 (37.44)	241 (38.89)	243 (46.93)	156 (50.19)	656 (54.28)	333 (62.66)	1711 (50.36)
Marital status							
In long-term relationship	194 (83.80)	507 (75.80)	447 (77.78)	266 (78.91)	942 (75.44)	427 (76.19)	2783 (76.86)
Location							
Iraq	177 (75.97)	392 (61.36)	364 (71.04)	208 (67.79)	771 (65.90)	435 (81.07)	2347 (69.35)
Afghanistan	70 (24.03)	303 (38.64)	219 (28.96)	137 (32.21)	534 (34.10)	153 (18.93)	1416 (30.65)
Role							
Combat	32 (12.95)	77 (11.87)	72 (13.09)	84 (25.28)	389 (31.26)	231 (39.89)	885 (24.75)
Noncombat	212 (87.05)	583 (88.13)	491 (86.91)	258 (74.72)	908 (68.74)	356 (60.11)	2808 (75.25)
Service							
RN	16 (6.83)	61 (9.88)	26 (3.27)	20 (6.60)	77 (7.04)	30 (5.29)	230 (6.53)
RM	6 (1.46)	15 (1.97)	13 (1.32)	13 (2.46)	83 (5.25)	22 (2.86)	152 (3.14)
Army	128 (53.31)	374 (54.67)	306 (52.44)	298 (88.04)	1118 (86.30)	534 (91.57)	2758 (74.15)
RAF	97 (38.40)	245 (33.48)	238 (42.97)	14 (2.90)	27 (1.41)	2 (0.28)	623 (16.18)
Rank							
Officer	71 (25.45)	201 (24.01)	132 (17.05)	70 (18.15)	196 (13.78)	81 (10.18)	751 (16.59)
NCO	124 (56.78)	343 (56.29)	313 (63.03)	199 (63.08)	744 (63.38)	352 (67.69)	2075 (62.40)
Other ranks	52 (17.77)	151 (19.69)	138 (19.92)	76 (18.77)	365 (22.84)	155 (22.13)	937 (21.01)
Enlistment status regular	230 (96.17)	623 (94.55)	546 (96.60)	308 (93.64)	1117 (91.59)	538 (94.53)	3362 (93.91)
Health							
mTBI	3 (0.99)	17 (2.71)	11 (2.60)	16 (4.93)	50 (3.98)	41 (7.51)	138 (4.03)
PTSD	5 (2.22)	23 (3.66)	17 (3.84)	22 (7.64)	46 (3.90)	33 (5.53)	146 (4.36)
Psychological distress	37 (15.49)	122 (18.50)	106 (19.91)	71 (20.22)	231 (19.14)	135 (23.58)	702 (19.78)
MPS	13 (4.80)	43 (7.07)	46 (9.39)	26 (9.30)	103 (9.54)	59 (11.44)	290 (9.08)
Alcohol misuse	25 (12.13)	91 (13.73)	89 (14.23)	64 (19.67)	212 (16.38)	125 (20.14)	606 (16.23)

Abbreviations: MPS, multiple physical symptoms; mTBI, mild traumatic brain injury; NCO, noncommissioned officer; PTSD, posttraumatic stress disorder; RAF, Royal Air Force; RM, Royal Marine; RN, Royal Navy.

TABLE 2 *Linear association between length of deployment and each outcome unadjusted and adjusted for sociodemographic factors*

Royal Marine and Army only	**mTBI (*N* = 2689), OR (95% CI)**	**PTSD (*N* = 2876), OR (95% CI)**	**GHQ-12 (*N* = 2860), OR (95% CI)**	**MPS (*N* = 2669), OR (95% CI)**	**AUDIT (*N* = 2851), OR (95% CI)**
Unadjusted length of deployment (month)	1.306 (1.129–1.511)	1.007 (0.900–1.126)	1.023 (0.962–1.088)	1.085 (0.995–1.184)	1.019 (0.954–1.088)
Adjusted[a] length of deployment	1.248 (1.077–1.446)	0.992 (0.882–1.117)	1.028 (0.961–1.099)	1.083 (0.987–1.189)	0.964 (0.898–1.035)
Total sample	**(*N* = 3495), OR (95% CI)**	**(*N* = 3725), OR (95% CI)**	**(*N* = 3708), OR (95% CI)**	**(*N* = 3474), OR (95% CI)**	**(*N* = 3700), OR (95% CI)**
Unadjusted length of deployment (month)	1.307 (1.154–1.480)	1.10 (0.997–1.214)	1.043 (0.991–1.098)	1.108 (1.030–1.191)	1.092 (1.032–1.155)
Adjusted[a] length of deployment	1.208 (1.056–1.383)	1.026 (0.914–1.153)	1.026 (0.966–1.090)	1.098 (1.006–1.199)	0.998 (0.935–1.065)

Abbreviations: AUDIT, Alcohol Use Disorders Identification Test; CI, confidence interval; GHQ-12, General Health Questionnaire-12; MPS, multiple physical symptoms; mTBI, mild traumatic brain injury; OR, odds ratio; PTSD, posttraumatic stress disorder.

[a]Adjusted for gender, age divided into 5 groups, education level, marital status, service, rank, and type of engagement (regular and reserves).

that the more appropriate estimate when dealing with mTBI during the last deployment would be in terms of the number of mTBI cases per 100 person-years that could be construed as an incidence rate but with the limitations indicated in the "Methods" section and this section. Thus, the incidence of mTBI in the UK RMs and Army would be 10.2 (95% CI: 9.3–11.1) per 100 person-years and for the UK armed forces 9.0 (95% CI: 8.3–9.8). Assuming that the published articles from the US forces were based on service personnel who were all deployed for 12 months, admittedly a simplification, the incidence in the studies comparable with ours would be 15 and 22.8 per 100 person-years that is equivalent to 15% to 22.8% if each person was deployed for 1 year exactly.[1,5] However, another US study reported considerable differences comparing mTBI made before the end of the deployment (9%) to assessment 1 year later (22%).[6] The latter would be more appropriate for comparison with our study, because the great majority in our study completed the questionnaire months after the last deployment (median 17 months). In addition, we should take into account that the deployment length in that particular study was 16 months.[6] Thus, perhaps the best estimate is that mTBI in US forces varies from 15 to 23 per 100 person-years of observation compared with around 10 per 100 person-years for UK forces when length of deployment is taken into account. Thus, the differences between United States and United Kingdom remain but are less marked than the initial rate might suggest.[3]

We would maintain that prevalence is inappropriate when we are estimating mTBI occurring during the last deployment. Furthermore, we suggest that estimates of mTBI based on studies, which assess mTBI in any deployment, are difficult to interpret unless we know the number and length of each deployment.

We are less certain as to whether our estimate truly corresponds to incidence of mTBI, because there are several factors that may distort the relative frequency of mTBI even when length of deployment is taken into account.

The most frequent mechanisms resulting in mTBI (blasts, falls, and vehicle incident) may not be regular events during deployment but clustered around particular periods during deployment. A variant of this explanation would be that over the usual period of deployment of the UK military, significant operations with high risk of mTBI follow a pattern, which is not necessarily closely associated with length of deployment.

Among the inaccurate reporting of events it is worth considering recall bias; that is, those who are deployed for a shorter period of time would be more prone to report incidents leading to mTBI than those who deployed for a longer period of deployment. This may be because early on, personnel would be more

sensitive to register exposure events, for example, blasts occurring at some distance are noticed but become less noticeable as the deployment progresses. Some support for this mechanism would come from the finding in a study in an outpatient setting that PCS do not vary according to distance from blast and number of blasts experienced in mTBI patients.[16] Recall bias may vary with time since deployment as reported in a longitudinal study.[6] Although this type of inaccuracy may not be associated with length of deployment, they may still increase nondifferential measurement error, thus attenuating an association between mTBI and length of deployment. Another source of misclassification could be that though the question on mTBI is drafted in relation to the latest deployment, some participants may choose to ignore this restriction and provide information for an mTBI outside last deployment to Iraq or Afghanistan. Last, comorbidity may be another factor of distortion, because mTBI and PTSD have been shown to be highly associated [1–4,17–19] and reporting of an mTBI may be more likely in those with PTSD.

In spite of these limitations, our analysis demonstrated that the association between length of deployment and mTBI was persistent and of intermediate effect size. A way of testing our findings would be a study, which includes US and UK subjects, using a similar methodology to assess the association between mTBI and length of deployment over a longer period.

We were careful not to overadjust our analysis. We consider that age, gender, education level, marital status, service, type of engagement, and rank were the minimal set of confounders in the association between length of deployment and mTBI. Lack of adjustment for these variables would have increased uncertainty that any relation would be due to a confounder rather than length of deployment. However, we ensured that we did not adjust for variables that may directly relate to length of deployment such as time spent in a forward area.

The advantage of our study is its size; thus, our results are unlikely to be due to random variation. The mTBI questions clearly refer to the latest deployment and we excluded personnel who were deployed to both Iraq and Afghanistan in the period 2003 to 2009.

A limitation of our study was that service personnel completed the questionnaire after returning from deployment and mTBI cases were not clinically corroborated. This is a common feature of most, if not all, large military epidemiologic studies, with 1 exception.[6] A reliable diagnosis of mTBI during deployment is difficult because of the lack of objective measurement of symptoms, limited availability of diagnostic tools with high validity, and the overlap of concussion symptoms with other common conditions such as PTSD and acute stress reaction.[7]

That this study was not longitudinal could be construed as a disadvantage in assessing the incidence of mTBI. However, follow-up studies also have limitations for assessing incidence, because most common mental health problems and PTSD tend to fluctuate over time and may be subject to recall bias; thus, the procedure to exclude those with a condition in the initial assessment from the total of cases in the second assessment may be artefactual.

Implications of our results

Reporting relative frequency in terms of person-years of deployment should be considered when the range of length of deployment in a study is heterogeneous. It would be advisable to replicate this study in other samples with wider range of length of deployment, say between 1 and 15 months.

Our results suggest caution when assessing the association between mTBI and PCS. The analysis has not only the known limitations that the symptoms of PCS are nonspecific but also that while mTBI is limited to a recent event, PCS may correspond to events that might have happened before mTBI occurred, thus reducing the chance of finding an association.

In conclusion, military studies should be careful to ensure that they compare like with like when assessing the relative frequency of mTBI and in particular to ensure that length of deployment is included in the estimate. Our analysis did not show the need for a similar approach in relation to PTSD, psychological distress, and alcohol misuse.

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