

Attrition of Military Enlistees with a Medical Waiver for Chronic Headache, 1995–2000

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Background: Recurrent headaches are disqualifying for military service if they are of sufficient severity or frequency to interfere with normal function in the past 3 years. The occupational impact of waiving this standard is evaluated. **Methods:** A retrospective cohort study of enlistees from January 1, 1995, through December 31, 2000, was performed. Enlistees with a waiver for recurrent headaches were compared with fully qualified enlistees (matched 3:1) for retention in the military, headache-related discharges, and hospitalizations. **Results:** The 174 individuals with waivers for a history of recurrent headaches were retained on active duty at the same rate as the 522 matched control subjects (log rank test, $p = 0.91$). Medical record review of waivers documented no debilitating headaches within 1 year before the medical examination. **Conclusions:** These results validate the current headache waiver criteria from the perspective of retention and suggest a more lenient medical accession standard. Future studies should evaluate the morbidity and occupational impact of headaches in the U.S. military.

Introduction

Headaches are a common disorder, afflicting nearly every person at some point in their lives. Headache can be a difficult entity to classify because it is a subjective experience, with limited objective measures such as laboratory and imaging studies. Headache may be a symptom of a wide range of neurobiological derangements. However, primary headaches (those not stemming from other initial pathological conditions) represent a described legitimate disorder.

A large, U.S. population-based study documented the prevalence of episodic, tension-type headaches among 18- to 29-year-old individuals as 34.5% among men and 40.8% among women over a 1-year period.¹ Migraines, the most debilitating form of headaches, affect 6% of men and 18% of women in the general population.^{2,3}

The overall cost of migraine to society is comparable to that of diabetes mellitus and higher than that reported for asthma.⁴ The estimated annual cost of migraines for U.S. employers is more than \$3,000 per migraine patient, with most of this loss being attributable to absenteeism and reduced workday equivalents.⁵ When military personnel are incapacitated by recurrent headaches, additional unique costs are incurred. These costs

include diminished force readiness, lack of mission accomplishment, and the potential for increased rates of morbidity and death on the battlefield.

Military personnel are exposed to hostile environments that may precipitate or exacerbate headaches. Common headache precipitants encountered include sleep disruption, dehydration, arduous physical tasks, and emotional stress. Additionally, one study indicated that some individuals' chronic tension headaches might be associated with psychiatric stresses associated with the armed forces unique authority structure.⁶ Headaches are likely to increase during the stresses of combat. Whether incapacitated in the field with severe headaches or functioning with limited capacity in garrison because of chronic moderate headaches, soldiers with headaches have the potential to become liabilities to their units.

Each year, there are ~150,000 enlisted recruit accessions for the combined services, including all components (active and reserve) and both previous and nonprevious service.⁷ Entrance examinations record headaches only if the applicant voluntarily reports the information. It is known that some applicants underreport medical problems, and this appears to be true with headache history as well. A portion of this underreporting may be attributable to a lack of previous physician diagnosis at the time of the entrance examination. In one civilian-sector study, approximately 60 to 70% of individuals determined to have migraine from self-reported symptom data had never received a diagnosis from a physician.⁸ More-recent data indicate that approximately one-half of migraine patients in the United States remain undiagnosed by a physician.⁹ This highlights a fundamental difficulty in studying medical conditions without objective markers or diagnostic tests.

A history of recurrent headaches is currently disqualifying for military service if "they are of sufficient severity or frequency as to interfere with normal function in the past 3 years."¹⁰ The recurrent headache category is composed predominantly of individuals who suffer from migraine or tension-type headache (as commonly defined by the International Headache Society criteria).¹¹ When applicants are medically disqualified on an entrance medical examination, they may request a waiver for that disqualifying condition. The waiver process involves additional medical record reviews and may include examination by an appropriate medical specialist. Each military service (Army, Air Force, Navy, and Marine Corps) has its own procedure and criteria for approving waiver applications, determined by the central waiver authority of that service.

Enlistees found to be suffering from debilitating chronic headaches in the first 180 days of service can receive an expedited discharge, referred to in the Army as existed prior to service (EPTS). From 1998 to 2000, there were 681 discharges for re-

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The views expressed are those of the authors and should not be construed as representing the positions of the Department of the Army or the Department of Defense.

This manuscript was received for review in August 2005. The revised manuscript was accepted for publication in January 2006.

current headaches that existed before service. Only eight of those individuals had previously received a waiver for this condition. A review of 117 EPTS discharges for headaches in 2001 revealed that most of the individuals involved (102 individuals; 87.2%) had concealed their history of having suffered severe headaches before service and nearly three-fourths of those histories were of the migraine type.⁷

Since 1997, the Department of Defense has been working toward establishing an evidence-based accession medical policy through epidemiological analysis of existing databases.¹² This study was undertaken to determine whether the current headache standards and waiver procedures are appropriate.

Methods

We conducted a retrospective cohort study of individuals entering active duty between January 1, 1995, and December 31, 2000. Case subjects were enlisted recruit applicants who initially were disqualified for enlistment solely because of their self-reported history of recurrent headaches and who subsequently obtained a waiver for this condition and entered active duty during the study period. The fully qualified comparison subjects (selected from those entering active duty who did not require a waiver) were matched 3:1 with case subjects with respect to age (within 1 year), service (Army, Air Force, Navy, or Marine Corps), gender, race (African American, Caucasian, or other), and month of starting basic training. Both populations were monitored from entry into active service through December 31, 2000.

Accession medical data were provided by the service-specific waiver authorities, and accession data were provided by the Defense Manpower Data Center. The Patient Administration Systems and Biostatistical Activities provided hospitalization data. U.S. Military Entrance Processing Command provided EPTS discharge data.

Kaplan-Meier attrition analyses were performed to evaluate the probability of staying on active duty and remaining free of a headache-related discharge or hospitalization. The first endpoint was defined as premature discharge from the service for any reason, including nonmedical conditions. The second endpoint was any headache-related outcome, including discharge because of a headache condition and headache-related hospitalizations (International Classification of Diseases, 9th Revision, codes 346 [migraines], 784.0 [headaches, not otherwise specified], 307.81 [tension headaches], and 340-349 [other disorders of the central nervous system]). For each of the specified conditions, the chronologically first hospitalization involving that condition during the first year of service was sought for each subject. Subjects lost because of nonheadache health conditions were treated as censored data in the second analysis. EPTS discharges because of headache and all other causes were identified in the headache waiver and fully qualified study groups.

Demographic characteristics of case subjects were compared with those of the general recruit population by using the binomial test. Significance for attrition curve comparisons was based on the log rank and Wilcoxon tests. All analyses were performed using SAS software (version 8.2; SAS Institute, Cary, North Carolina). The Walter Reed Army Institute of Research institutional review board and the Johns Hopkins University institutional review board approved the study.

In a supporting analysis, we sought to gauge the severity of the reported headaches and to ascertain apparent criteria for granting a waiver. To that end, all waiver requests for a history of recurrent headaches that were submitted to the Navy and Marine Corps between February 1998 and April 2000 were reviewed. One hundred records of approved ($n = 41$) and disapproved ($n = 58$) headache waiver applications were included in the review. Documents reviewed included, where available, the Military Entrance Processing Station medical examination, medical records, specialty (neurology and other) consultations, and diagnostic testing results such as neuroimaging reports.

Results

A total of 332 individuals received an accession medical waiver approval for a history of recurrent headaches and nothing else during the study period. Of these, 174 (52.4%) entered active duty enlisted service for the first time during the study period and had complete plausible data. The 522 fully qualified enlistees were randomly selected based on the matching criteria. Demographic characteristics of the study groups are detailed in Table I.

Any discharge (other than successful completion of enlistment) was the endpoint used for the overall survival analysis. Demographic characteristics of attrition cases in the study groups are detailed in Table II. No difference was found between the waiver group and the fully qualified comparison group (Fig. 1). Waiver practices across the services may not be uniform; therefore, separate analyses were performed. There were no significant differences in attrition found between case and control subjects in the Army, Marine Corps, or Navy ($p > 0.10$ for each branch of service). The number of recruits entering the Air Force with a waiver for recurrent headaches ($n = 8$) was too small to analyze separately.

TABLE I
DEMOGRAPHIC CHARACTERISTICS IN STUDY GROUPS OF ENLISTEES WITH HEADACHE WAIVERS AND FULLY QUALIFIED ENLISTEES

	Headache Waivers ($n = 174$)	Fully Qualified ($n = 522$)
Gender, n (%)		
Male	131 (75)	393 (75)
Female	43 (25)	129 (25)
Race, n (%)		
Caucasian	134 (77)	402 (77)
Non-Caucasian	40 (23)	120 (23)
Age (years), mean \pm SD	20.3 \pm 2.8	20.3 \pm 2.7
Age group		
17-18 years	37 (22)	114 (22)
19-22 years	119 (68)	353 (68)
23-35 years	18 (10)	55 (10)
Branch of service, n (%)		
Army	81 (46)	243 (46)
Navy	50 (29)	150 (29)
Marine Corps	35 (20)	105 (20)
Air Force	8 (5)	24 (5)

TABLE II

DEMOGRAPHIC CHARACTERISTICS OF ATTRITION CASES, IN STUDY GROUPS OF ENLISTEES WITH HEADACHE WAIVERS AND FULLY QUALIFIED ENLISTEES, WITHIN 2 YEARS OF SERVICE

	No.	
	Headache Waivers	Fully Qualified
All cases	41	127
Gender		
Male	31	87
Female	10	40
Race		
Caucasian	35	100
Non-Caucasian	6	27
Age group		
17-18 years	9	24
19-22 years	29	90
23-35 years	3	13
Branch of service		
Army	15	59
Navy	17	41
Marine Corps	8	19
Air Force	1	8

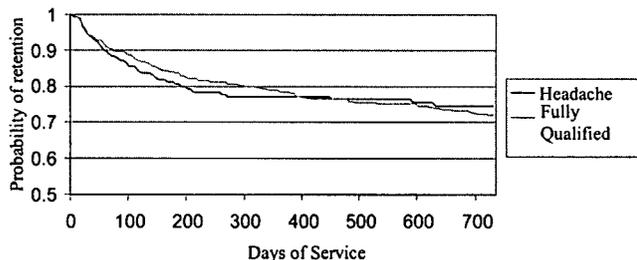


Fig. 1. Kaplan-Meier attrition analysis for enlistees with headache waivers versus fully qualified enlistees (log rank test, $p = 0.91$; Wilcoxon test, $p = 0.81$).

The second endpoint examined was any outcome potentially related to headaches (e.g., preexisting headaches resulting in EPTS discharge or headache-related hospitalizations). The headache waiver and fully qualified groups had similar rates of discharges for any preexisting health conditions unrelated to headaches (4% [7 of 174 enlistees] and 3.3% [17 of 522 enlistees], respectively; $p = 0.81$) and few discharges for "other unspecified headaches" (three enlistees with headache waivers and one fully qualified enlistee; Fisher's exact test, $p = 0.05$). There were no EPTS discharges for migraine or tension headaches in either group. There were eight hospitalizations for any condition (none was attributable to headaches) during the first year of service among the enlistees with headache waivers and 23 among fully qualified enlistees, a difference that was not statistically significant (χ^2 test with Yates correction, $p = 0.91$). Approximately one-half of those hospitalizations were coded as a mental health-related problem (four cases in the headache waiver group and 13 in the fully qualified group). The risks of experiencing any medical outcome (EPTS discharge or hospitalization) were not statistically different between groups, estimated at 6.9% (12 of 174 enlistees) versus 5.9% (31 of 522 enlistees) after 2 years of follow-up monitoring.

It should be noted that by far the largest discharge category in our study was an administrative discharge, "failure to meet minimum behavioral and performance criteria." This accounted

for 26 individuals in the headache waiver group (63.4% of all discharges) and 81 individuals in the fully qualified group (63.8% of all discharges).

Given the clear lack of excess attrition among the subjects with waivers for a history of headaches, it was of interest to know the nature of headache histories for which the waivers were granted. The review of medical waiver records from the Navy waiver authority revealed a total of 41 granted waivers and 58 denied waivers during the 27-month period examined. There was no significant difference between granted and denied packages with respect to gender (male gender, 56% versus 57%), average age (19.2 years versus 19.5 years), or migraine diagnosis (51% versus 55%). The granting of headache waivers is determined based on individual risk assessment.

The medical records of individuals granted waivers had no evidence of a significant history of frequent and/or severe headaches that interfered with normal functioning in civilian life before enlistment. Of those records in which the approximate date of the last headache was noted, 58% were within the past 6 months, 29% between 6 and 12 months, and 13% between 1 and 3 years. Waiver approvals allow for recent symptoms of headaches, even within the previous 6-month period, as long as symptoms were not frequent or severe enough to alter normal life.

Applicants denied waivers all had at least one factor in their medical record indicative of a potentially significant headache condition. The following is a list of the notations found most frequently in the denied packages: incapacitated/misses school or work ($n = 29$), history of previous prescription headache medications ($n = 15$), currently two or more headaches per week ($n = 9$), previous early discharge from military service ($n = 8$), excess worry/stress-induced headaches ($n = 7$), and intensive neurological evaluation including neuroimaging required in the past ($n = 6$). Of the records in which the approximate date of the last headache was noted, 89% were within the past 6 months, 11% between 6 and 12 months, and none between 1 and 3 years. All who were denied a waiver for a history of headaches had symptoms within 1 year before application for enlistment, and the frequency or severity of their headaches interfered with normal function.

Discussion

This study found that, among those with waivers for headache, there were very few discharges attributed to preexisting headache and no hospitalizations for headaches or related conditions. Overall retention rates among those with headache waivers were no different from rates for the fully qualified matched comparison group. This held true overall, as well as within each service, according to age, gender, and race. This indicates that current headache waiver criteria appear to be an appropriate method of screening candidates for successful military service, with respect to successful completion of a 2-year active duty commitment.

The study suggests that the 3-year disease-free interval for significant headache morbidity may be more conservative than necessary. Our review of Navy/Marine Corps headache waiver considerations found that 87% of those granted such a waiver, and 100% of those denied a waiver, had headache symptoms within the past year. The distinction appeared to lie in the

frequency and/or severity of the reported headaches and whether they had interfered with everyday life.

In our waiver record review, there were no denied waivers among applicants whose last headache was >1 year earlier. For conditions based on self-reporting of symptoms, such a long time frame may not add materially to the screening method. However, our data are not robust enough to recommend any specific changes to current accession criteria. Recommendations for changes would be strengthened by cost-effectiveness analyses that include costs of medical consultations for military applicants, treatment of headaches, and loss of productivity during military service.

There are several limitations to this study. The entry point for selection consideration into the headache group was based on self-reporting of symptoms. We know that a significant number of applicants underreport symptoms on their entrance medical examination, and we were unable to verify that the individuals in the fully qualified cohort were all headache free. Such misclassification would tend to mask any difference in outcomes between the waiver group and the matched comparison group.

Another limitation is that there is no single, well-accepted criterion used to define what constitutes a severe recurrent headache. This might lead to a lack of uniformity in what is reported by service applicants to medical screeners and what is deemed by those screeners to be medically disqualifying.

Our primary endpoint of military retention is a concrete measure of success, addressing the specific question of whether individuals with headache waivers are successfully completing their tours of military service. However, it is only one of many potential analytical endpoints. Hospitalization data are not an ideal surrogate of morbidity, because headaches are generally treated in the outpatient setting. Data on outpatient health care visits and use of prescription medication for headaches would offer more insight into the successful integration of the service members into the military. Productivity and absenteeism data were not included in this study because they were not readily available, but those are additional useful measures that have been evaluated in other studies.^{13,14}

This study lends support to the notion that patients with headaches are not necessarily a liability to the Department of Defense. They are capable of performing mentally and physically demanding jobs without an increase in hospitalization or discharge from service.

We think that there is a need for additional military and civilian workplace studies evaluating outpatient morbidity, productivity, absenteeism, and responses to both pharmacological

and nonpharmacological therapies. Continued research in this area can significantly improve the preplacement evaluation, productivity, and job satisfaction of individuals suffering from chronic headaches, in military and civilian workplaces.

Acknowledgments

We thank CPT Amy Millikan for editorial assistance and the Department of Defense Accession Medical Standards Steering Committee and Working Group for support.

This study was performed within the Accession Medical Standards Analysis and Research Activity funded by Department of Defense Health Affairs.

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