

The Asthma Accession Standard: A Survival Analysis of Military Recruits, 1995 to 1997

Guarantor: Kathryn L. Clark, MD MPH

Contributors: Kathryn L. Clark, MD MPH*; Yuanzhang Li, PhD*; LTC Margot R. Krauss, MC USA†; COL Patrick W. Kelley, MC USA†

Asthma has a significant impact on U.S. military expenditures and readiness. Every year approximately 1,000 recruits are discharged for asthma during their first 6 months of service. This study was done to evaluate the practice of allowing some individuals with a history of asthma to enter military service (waiving). A survival analysis was performed to compare length of time until discharge and asthma-related failure for individuals waived for asthma (cases) and individuals not disqualified for asthma (controls). Cases were 587 recruit applicants initially disqualified who received waivers for asthma and accessed in the years 1995 to 1997. Controls were 1,761 matched enlisted recruits starting basic training in those years. No significant differences were found with respect to general attrition. The statistical differences for asthma-related hospitalization or discharge did not translate into practical differences. Waiving for asthma was not a significant occupational liability in terms of asthma-related hospitalization or early military attrition.

Introduction

Asthma is a common malady that affects approximately 2 to 6% of the U.S. population at any time.¹⁻³ There has been an increase in the hospitalization rate, death rate, and overall prevalence of asthma in the United States during the last 20 years.² Although civilians with asthma may still experience immense success in organized sports, they have the opportunity to maintain fine-tuned medication regimens in controlled environments. However, asthmatics in the military can be deployed quickly on short notice to diverse geographic areas, some of them remote, often without adequate, reliable access to necessary medications. Asthma is especially problematic to the military because active duty persons are exposed to various factors that may exacerbate asthma, such as exercise, cold, dust, stress, smoke, fumes, pyridostigmine, and possibly some unknown environmental factors. One study found higher asthma-related hospitalization rates and mortality for U.S. Army soldiers in Europe than for those in the United States.⁴

Asthma has been a documented military readiness issue since the 1940s. In World War II, 30% of applicants were disqualified for military service, 2% of them for asthma.² In a British study, it was predicted that of U.K. Army enlistees with a history of childhood asthma and remission in their teens, 40%

would flourish but 25% would require downgrading of their duties and 35% would be discharged because of asthma.⁵ In Operation Desert Storm, 500 U.S. Army soldiers could not deploy because of asthma, and 200 who did deploy were then evacuated because of asthma.³ There are extensive costs and loss of readiness associated with illness, disability, and discharge related to asthma.

Before 1995, the U.S. Department of Defense (DoD) allowed individuals with a history of asthma symptoms that ceased by age 12 to enter the military.⁶ This directive changed (effective August 30, 1995) to disqualify individuals with a history of asthma reliably diagnosed at any age. Ideally, the DoD would not accept anyone with a known medical condition into the service. Unfortunately, there is a finite number of qualified volunteers from which to choose, and denying entry into the military to everyone with any history of asthma leaves a substantially smaller applicant pool from which to choose recruits. This analysis was performed to evaluate the impact of waiving standards for some individuals with asthma and allowing them to enter active duty. The waiver authorities may grant a medical waiver on an individual basis considering various factors, such as the absence of asthma symptoms since the age of 12 years, successful participation in high school athletics (without asthma symptoms), and evidence of high motivation.

Methods

A survival analysis of individuals receiving asthma waivers compared with those not disqualified for asthma was performed to evaluate the probability of staying on active duty or remaining free of asthma-related hospitalization or discharge.

Cases were enlisted recruit applicants (to the Air Force, Army, Marines, and Navy) disqualified by initial medical examination (given at the military entrance processing stations) who received a waiver for asthma and started training in 1995, 1996, or 1997. They were verified to have started basic training by Defense Manpower Data Center (DMDC) data. Controls were chosen from DMDC records from the same years. Controls were matched with cases in a 1:3 ratio based on age within 1 year, service, sex, month started basic training, and race (black, white, and other).

In the analysis, the first end point was defined as a discharge from the service for any reason, including nonmedical conditions. Discharge data were obtained from the active duty loss files at DMDC. The second end point used was an asthma-related discharge for a condition that existed prior to service (EPTS), a disability discharge for asthma (Veterans Benefits Administration Department of Veterans Affairs code 6602), or a hospitalization for asthma (International Classification of Diseases, 9th Revision, codes 493.0, 493.1, 493.2, and 493.9). A

*Allied Technology Group, Rockville, MD.

†Division of Preventive Medicine, Walter Reed Army Institute of Research, Washington, DC.

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recruit with a preexisting disqualifying illness that manifests during the first 6 months of service most likely will be given an EPTS discharge; however, individuals are discharged on a case-by-case basis. All losses were weighted equally in this analysis. Variable follow-up times were accounted for in the analysis. SAS software (SAS Institute, Cary, North Carolina) was used. Significance was based on the log rank, Wilcoxon, and log likelihood ratio tests.

Results

A total of 672 individuals were waived for asthma during the study period. Thirty-three Air Force cases were excluded because of incomplete information. Of the remaining 32 individuals in the Air Force, 6 were discharged during the study period, 4 for nonmedical reasons. The Air Force cases were excluded because of small numbers. An additional 20 cases (17 Army, 1 Marine, and 2 Navy) were excluded because of incomplete information on length of service. The 587 remaining cases and 1,761 matched controls did not differ significantly with regard to age, service, sex, race, and month started training. The median age of cases and controls was 19 years, with 23% older than 20 years. Cases and controls were mostly white (73%) and male (89%). Fifty-four percent of the cases and controls were in the Army, 28% were in the Navy, and 18% were in the Marines.

Figure 1 shows the probability of survival for cases and controls using the first end point, any discharge from the service. The rate of discharge in 3 years for cases, 22.0% (129 of 587), was not significantly different from the rate for controls, 24.6% (434 of 1,761). Each service has a separate waiver authority that evaluates the records of individuals disqualified and grants waivers where it deems appropriate. Waiver practices across the services are not uniform, and to determine whether the individual services might differ, separate analyses were performed. There were no significant differences in survival found between cases and controls in the Army, Marines, and Navy.

When the second end point was used (an asthma-related failure such as EPTS discharge, hospitalization, or disability discharge), a statistical difference was found in survival between cases and controls. The probability of an asthma-related failure for cases was 4.3% (25 of 587) versus 0.3% (6 of 1,761) for controls, as depicted in Figure 2. Asthma-related hospitalizations and discharges occurred earlier than overall discharges,

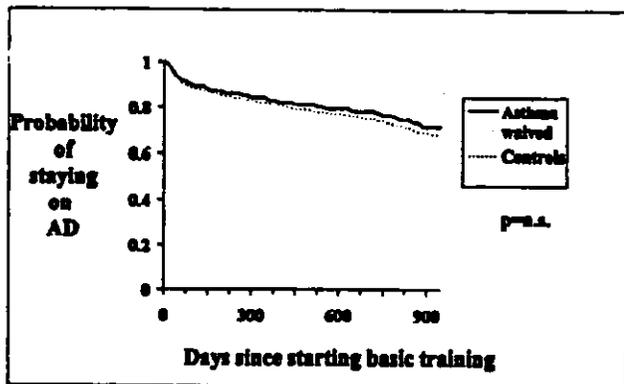


Fig. 1. Probability of remaining on active duty after accession: Army, Navy, and Marines.

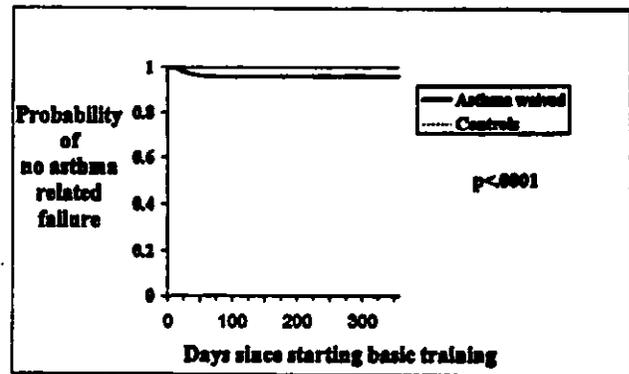


Fig. 2. Probability of avoiding EPTS, hospitalization, or disability for asthma: Army, Navy and Marines.

which occurred more evenly during the 3-year study period. In Figure 2, which pertains to the second end point, only 300 days are shown because most failures occurred in less than 100 days and none occurred after 300 days. Despite the statistical difference, the model predicts only 25 cases hospitalized or discharged for asthma over 3 years.

The impact by service was also significant for the Army and Navy but not for the Marines because of small numbers (a single discharge). Again, the overall impact of asthma-related hospitalization or discharge was small (18 Army cases and 6 Navy cases).

Individuals waived for asthma who subsequently received EPTS discharges for asthma represent a small portion of all EPTS discharges for asthma. According to the coding done at military entrance processing stations when EPTS paperwork is returned from the units, 72.8% of the 1,014 individuals with asthma EPTS discharges in 1995 did not reveal their asthma (and thus were not waived) before entering basic training (Fig. 3).

Discussion

Individuals allowed to serve on active duty despite a history of asthma (waived for asthma) are not more likely to be discharged than matched controls. Those waived for asthma may be more likely to experience an asthma-related outcome specifically, but this did not translate into a practical difference. This study was undertaken to analyze the waiver process with respect to asthma. However, 72.8% of people receiving asthma EPTS discharges were never part of the waiver process being evaluated in

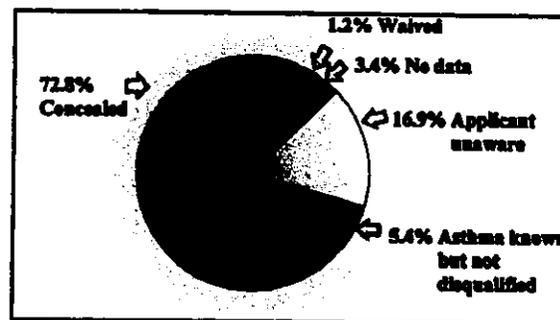


Fig. 3. A total of 1,014 asthma EPTS discharges in 1995.

this study. Therefore, a perfected waiver process would not prevent the majority of premature asthma failures.

In this study, it was assumed that the data had been recorded properly and that data from the data sources were valid. Only waivers with complete information were used in the analysis. Survival times of different subjects were assumed to be independent.

Diagnoses of asthma were not validated independently. Severity of disease was not available in the data sources used for this analysis, and the differences in hospitalizations and discharges for mild, moderate, and severe asthma cannot be investigated separately. It is possible that there may be differences with respect to the end points used in this study between severe asthmatics and matched controls. However, individuals with severe asthma are unlikely to be waived by one of the physician waiver authorities.

Ambulatory data were not available for the time covered in this study. Asthma outpatient morbidity has a significant impact on cost and military readiness, and a study of the impact of asthma on those end points is planned.

The impact of presumed asthma during Operation Desert Storm originally prompted the move to make the DoD asthma accession policy more conservative. This study was performed during peacetime and could not assess the contribution of wartime factors, such as potentially increased anxiety and more frequent wearing of protective gas masks, on asthma waiver recipients or matched controls. However, approximately 20% of individuals evacuated for asthma during Operation Desert Storm were found not to have asthma upon more complete evaluation (G.J. Argyros, personal communication, 1997) and may not have been waived for asthma.

In conclusion, the Accession Medical Standards Analysis and Research Activity found that the chance of remaining on active duty for someone entering the military with a waiver for asthma is comparable to that of a matched control. Asthma-related discharges and hospitalizations occur early. The probability of remaining free of asthma-related failure may be different be-

tween waived individuals and controls, but the small practical difference would not likely result in a policy change. For example, the Navy probably would not choose to deny entry into the service to 164 persons to avoid only 6 of them being hospitalized or discharged for asthma.

This study may provide some insight into how civilian young adults with a distant history of asthma may fare with regard to hospitalization when placed in a stressful and physically demanding environment.

Future studies should include assessment of the impact of job classification and should examine outpatient data on the success of asthma waiver recipients. Discussion of loosening the Air Force asthma waiver guidelines should wait until such studies are complete. Because the majority of asthma EPTS discharges occur in individuals not waived, a further evaluation of the accession medical examination should be conducted.

Acknowledgments

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