

Accession Standards for Attention-Deficit/Hyperactivity Disorder: A Survival Analysis of Military Recruits, 1995–2000

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A retrospective cohort study was conducted to evaluate the Department of Defense practice of allowing some individuals with a history of attention-deficit/hyperactivity disorder (ADHD) to enter military service (waiving for ADHD). Enlisted recruits who entered active duty with a waiver for academic problems related to ADHD were compared with control subjects who did not reveal health problems before entry, in terms of retention, promotion, and mental health-related outcomes. A total of 539 recruits with a history of ADHD were retained at the same rate as 1,617 control subjects, with no differences in promotion rates, comorbid diagnoses, or mental health-related discharges. On the basis of these findings, the Department of Defense medical accession standards have been changed to allow applicants who reveal a history of ADHD but did not require medication to finish high school or to hold a job for at least 1 year the opportunity to enter active duty without going through the current waiver process.

Introduction

Attention-deficit/hyperactivity disorder (ADHD) is the most common neurodevelopmental disorder of childhood, estimated to affect 3% to 5% of all school-age children.¹ Prevalence estimates as high as 10% have been reported, in part because of different inclusion of subtypes, different methods, and the fact that the definition of the disorder has changed in various editions of the Diagnostic and Statistical Manual of Mental Disorders.² The increasing number of children diagnosed as having ADHD and the recognition that this disorder persists into adulthood make it a disease of importance to the military, whose recruit population is largely adolescent.^{3–5} The diagnosis of ADHD is currently disqualifying for military service if the ADHD interfered with school or work after age 12.⁶

Annually, >300 recruits disqualified for revealing a history of ADHD during their induction physical examination apply for a waiver to allow them to serve on active duty. A physician from the service to which they are applying (i.e., Army, Air Force, or Navy/Marines) reviews submitted medical records and may recommend a waiver for ADHD on an individual basis. In general, waivers are granted for recruits who have demonstrated academic achievement (high school graduation) or stable employment (>6 months) without therapeutic medication for at least 1 year.

Since 1997, the Department of Defense (DoD) has been work-

ing toward establishing an evidence-based, medical accession policy through epidemiological analysis of existing databases.⁷ This study was undertaken as part of this process, to evaluate the DoD practice of allowing some individuals with a history of ADHD to enter military service (waiving for ADHD).

Methods

We conducted a retrospective cohort study of individuals entering active duty from January 1, 1995 through December 31, 2000, as verified through accession data from the Defense Manpower Data Center (Monterey, California). Case subjects were enlisted recruit applicants disqualified in the initial medical examination who, based on individual service waiver authority data, obtained a waiver for ADHD and entered active duty during the study period. Control subjects (selected from those entering active duty who did not require a waiver) were matched with case subjects 3:1 with respect to age (within 1 year), service (Army, Air Force, Navy, or Marines), gender, race (African American, Caucasian, or other), and month of starting basic training. Both populations were monitored from entry to active service through December 31, 2002.

Kaplan-Meier survival analyses were performed to evaluate the probability of staying on active duty and remaining free of a mental health-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 mental health-related outcome, including discharge for a mental health condition, discharge for a behavioral problem (such as trouble with the law), any mental health hospitalization (International Classification of Diseases-9 codes 295–316), or mental health-related disability discharge. Those lost because of non-mental health conditions were treated as censored data in the second analysis.

All waiver requests for a history of ADHD submitted to the Navy and Marines in 1997 and 1998 were reviewed to gauge the diagnostic validity of the initial diagnosis and the apparent criteria for granting a waiver. The diagnosis was considered valid if it was confirmed by a psychiatrist or documentation of multiple years of therapeutic medication use that improved behavior and/or performance in school was provided. The initial diagnosis was considered “questionable” when stimulant use was <1 year in duration, documentation of family dysfunction that might have aggravated the child’s problems was provided, or any physician questioned the initial diagnosis.

Occupational “success” in the military was defined as retention in the military and the ability to be promoted at the same rate as peers. The majority of recruits enter at the lowest rank (E1), although those entering with any education above the level of high school generally start at a higher rank (E2 or E3).

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Logarithmic-linear analysis was used to consider all matched sets with available entry and final ranks with regard to promotion. Demographic characteristics of case subjects were compared with those of the general recruit population by using the binomial test. Significance for survival curve comparisons was based on log rank, Wilcoxon, and log likelihood ratio tests. All analyses were performed using SAS software, version 8.2 (SAS Institute, Cary, North Carolina). The study was approved by the Walter Reed Army Institute of Research institutional review board.

Results

A total of 758 individuals entered active duty with waivers for a history of academic problems secondary to ADHD during the study period; 219 (28%) had more than one condition waived (149 had medical conditions and 70 had other mental health conditions) and were excluded from the analyses. The 539 waived only for academic problems associated with a history of ADHD and the 1,617 control subjects were the same with respect to the matching criteria. Entry ranks of case and control subjects were representative of the general recruit population (75% of the recruit population, 75% of case subjects [405 of 539 subjects], and 75% of control subjects [1,213 of 1,617 subjects] started active duty at the lowest entry rank [E1]).

The study population was significantly younger (<21 years, 88% vs. 73%) and more likely to be Caucasian (95% vs. 70%) and male (97% vs. 82%), compared with the 850,900 recruits who entered training during the study period ($Z = 3.7$, $Z = 12.7$, and $Z = 9.1$, respectively; $p < 0.001$). The majority of case and control subjects had a high school education, i.e., 96% (505 of 524 subjects) and 95% (1,495 of 1,569 subjects), respectively; however, control subjects were significantly more likely to have received a general equivalency diploma in place of a diploma (5.9% of control subjects [89 of 1,495 subjects] vs. 3.1% of case subjects [16 of 505 subjects]; $p < 0.025$). Those waived for ADHD were less likely to have education beyond high school, compared with the general recruit population (1% and 5%, respectively; $Z = 4.3$, $p < 0.001$).

Any discharge (other than successful completion of enlistment) was the endpoint used for the overall survival analysis. No difference was found between the waiver group and the comparison group (Fig. 1). Waiver practices across the services might not be uniform; therefore, separate analyses were performed. There were no significant differences in survival found between case and control subjects in the Army, Air Force, Marines, or Navy ($p > 0.64$ for all services).

The second endpoint examined was any outcome potentially related to mental health problems (e.g., preexisting mental health problems resulting in discharge, mental health hospitalizations, mental health disability discharges, or discharges related to behavioral problems). Case and control subjects had similar discharge rates for any preexisting mental health conditions (1.7% [9 of 539 subjects] and 1.1% [18 of 1,617 subjects], respectively; $p = 0.4$) and few discharges for ADHD (two case subjects and two control subjects). Mental health-related hospitalization rates for case and control subjects were similar, i.e., 2% (11 of 539 subjects) and 1.5% (24 of 1,617 subjects), respectively, during the study period. There was only one mental health-related disability discharge of an unspecified nature

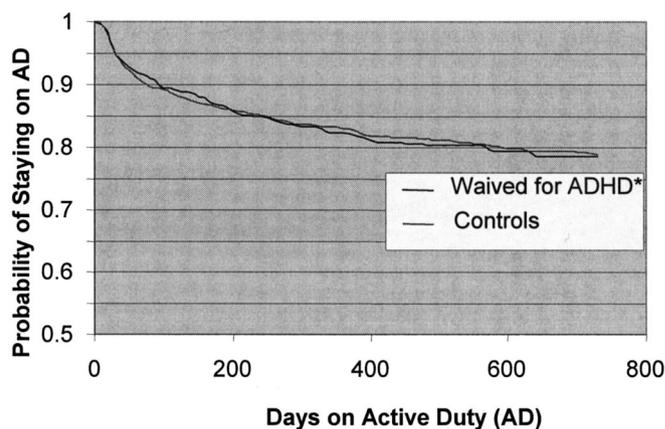


Fig. 1. Kaplan-Meier survival estimates of days on active duty (AD) for recruits waived for ADHD and control subjects in all services, 1995–2000. *No difference in survival rates (Wilcoxon test, $p = 0.89$; log rank test, $p = 0.88$; likelihood ratio, $p = 0.84$).

among the case subjects. The majority of these outcomes for case subjects (76.4%; 84 of 111 subjects) and control subjects (85.5%; 309 of 362 subjects) were behavior-related discharges, such as for conduct disorder or other behaviors incompatible with military service. The risks of experiencing any potentially mental health-related outcomes were not statistically different between case and control subjects, estimated at 20.6% (111 of 539 subjects) and 22.4% (362 of 1,617 subjects), respectively, after 2 years of follow-up monitoring. Coding of mental health- or behavior-related discharges might vary among the services; therefore, analyses were conducted for each service, with no significant differences found ($p > 0.17$ for all services).

To examine promotion potential, subjects missing entry or final rank data were excluded from analysis (18.7% of case subjects [101 of 539 subjects] and 19.5% of control subjects [316 of 1,617 subjects]). The analysis was further restricted to case subjects and matched control subjects who started at the same initial rank and had similar lengths of service (± 3 months). These 179 case subjects and their 294 matched control subjects were demographically similar to the entire study population and not statistically different in their promotion rates, using a logarithmic-linear model ($p = 0.2$).

Twenty-three percent of case waiver application data (123 of 539 cases) were reviewed; 72% of the subjects (88 of 123 subjects) had documentation consistent with mild uncomplicated ADHD (10 confirmed by psychiatric consultation and 58 with use for >1 year of therapeutic medication that improved grades or behavior) or had apparently “outgrown” their childhood diagnosis (20 subjects). The average length of stimulant use was 5 years (range, 2–10 years). All subjects had been coping without medication for at least 1 year. Twenty-six percent of the records (32 of 123 cases) included information that might call the original ADHD diagnosis into question, i.e., short trials of medication (23 cases), evidence of severe family problems (four cases), or documentation that the diagnosis was questioned by any physician (five cases). The remaining 2% (3 of 123 cases) had insufficient information provided to verify or refute the validity of the diagnosis.

Thirty-five percent of waiver applications (137 of 392 applications) submitted to the Navy from 1997 through 1998 were

denied. A review of 70 denied waivers (52%; 70 of 137 applications) revealed that 30% of subjects (21 of 70 subjects) had taken therapeutic medication within the year and/or could not hold a job for >6 months, 26% (18 of 70 subjects) failed to respond to the request for additional information, 20% (14 of 70 subjects) had ADHD with comorbidities (behavioral or learning disabilities), 7% (5 of 70 subjects) had personality disorders (not ADHD), and 17% (12 of 70 subjects) appeared to have had a waiver recommended.

Discussion

Recruits who reveal a history of ADHD, obtain a waiver, and enter active service are succeeding in the military, as measured by retention in the service and promotion rates, with no apparent increase in behavioral or mental health outcomes. The disproportionate number of Caucasian male subjects in the study population is consistent with previous observations that boys are three to five times as likely to receive treatment as girls and Caucasian subjects are more than twice as likely to be treated as African American and Hispanic subjects.^{3,8} Recruits with a history of ADHD were statistically less likely to have education beyond a high school degree but were promoted at the same rate as their matched control subjects, given comparable time in service. This finding is consistent with long-term studies of children with ADHD, which demonstrate that this childhood syndrome does not preclude the attainment of higher education or vocational goals.⁹

Given the problems inherent in making this diagnosis and the absence of a standard diagnostic test, misdiagnosis of this condition can be expected.¹⁰ However, the majority of the records available for review (72%) either confirmed the diagnosis of current, mild, uncomplicated ADHD or supported a previous ADHD diagnosis. This finding is similar to a study of 457 children diagnosed with ADHD by primary care providers, in which 72% received that diagnosis based on a structured psychiatric interview.¹¹ Studies have documented a variation in stimulant use from 12.5%¹² to 70%¹³ among children who meet full ADHD criteria; therefore, the 18% of applicants who provided a history of ADHD without long-term use of stimulants might have met full ADHD criteria. On the basis of the best data available, we assumed that the majority of recruits who revealed their history of ADHD during the physical examination process did have a reliable diagnosis in the past. The lack of significant behavioral problems after entry into active duty supports the medical record review observation that the majority of these individuals had resolved their ADHD symptoms or had mild uncomplicated ADHD.

There are several limitations to this study. First, this was a self-selected group of young adults seeking to enter the military who were willing to reveal their past academic and behavioral difficulties in school and their diagnosis of ADHD. Second, those who received waivers to enter active duty had no documented evidence of comorbid conditions and had achieved some success without medication for 1 year, with nearly all (96%) having obtained a high school education, and thus are not representative of all young adults diagnosed with ADHD as children. Cohort studies of children with ADHD have found that only 69% to 77% can be expected to graduate from high school.^{14,15}

Unfortunately, as many as 36% of young adults entering the

military may have a history of a mental health condition,¹⁶ either undisclosed or unrecognized, leading the DoD to prioritize research efforts in this area.¹⁷ In fact, 71% of those who received a discharge for undisclosed ADHD clearly had disqualifying comorbid conditions (i.e., major depression, personality disorder, conduct disorder, learning disabilities, or drug dependence), which most likely led to the discharge (M.R. Krauss, unpublished data). The observation that more recruits are discharged every year for undisclosed ADHD (~200 each year) than enter with a waiver for the disorder (~150 each year) calls into question the utility of disqualifying those who truthfully reveal their previous ADHD diagnosis.¹⁸

In addition, many children with ADHD, based on Diagnostic and Statistical Manual of Mental Disorders, Fourth Edition, criteria, never receive a diagnosis of ADHD (60–85%) or stimulant treatment (68–79%).¹⁹ Therefore, it would not be surprising to find that many recruits might have suffered with symptoms of ADHD but never received the proper diagnosis and treatment before entering the military. The magnitude of this problem is unknown but may be far greater than the number of recruits willing to reveal their history of the disorder at the time of the physical examination.

Developing evidence-based medical standards for accession into the military with a previous diagnosis of ADHD is fraught with difficulties, including the racial, gender, and socioeconomic inequalities in having ADHD symptoms recognized, diagnosed, and treated.⁸ The current military accession policy may inadvertently disqualify those most capable of serving, i.e., recruits who were properly diagnosed and treated and who were willing to reveal their history of ADHD at the time of the physical examination. Based in part on this study, DoD medical accession standards have recently changed to allow initial qualification of recruits who are willing to reveal a history of uncomplicated ADHD and who have been able to graduate from high school or to hold a job without medication for at least 1 year.²⁰

Evidence suggests that early detection and appropriate treatment can alter the probability of a negative developmental trajectory for children suffering from ADHD.²¹ Increased recognition and treatment for this disorder in early childhood might be expected to improve the outcomes for these children without hindering their ability to enlist and to serve successfully in the military. Future studies should evaluate the impact of this new DoD standard on military retention and performance.

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