

A Review of the US Army Experience Using Selective Serotonin Reuptake Inhibitors in Aircrew

Joseph F. McKeon, MD, MPH

Commander, US Army Aeromedical Research Laboratory
6901 Farrel Road
Fort Rucker, Alabama 36362
USA

joseph.mckeon@us.army.mil

James L. Persson, MD, MPH

Director, US Army Aeromedical Activity
5700 Novosel Street, Room 220
Fort Rucker, AL 36362
USA

james.persson@us.army.mil

James McGhee, MD MPH

Consulting Flight Surgeon
US Army Aeromedical Activity
5700 Novosel Street, Room 220
Fort Rucker, AL 36362
USA

James.mcgee@amedd.army.mil

Martin Quattlebaum

Chief, Epidemiology Branch
US Army Aeromedical Activity
5700 Novosel Street, Room 220
Fort Rucker, AL 36362
USA

Martin.quattlebaum@amedd.army.mil

ABSTRACT

As many as 300,000 soldiers may suffer from post traumatic stress disorder (PTSD), depression, or anxiety and less than half of them seek care, citing adverse career implications and stigmatization. Aircrew members are particularly prone to under-reporting illness, especially mental health issues, for fear of losing their flight status. Currently the US Army is the only US DoD service that allows aircrew diagnosed with PTSD, anxiety, and/or depression to perform aircrew duties while taking selective serotonin reuptake inhibitors (SSRI). Such use has been allowed with waiver since 2004. The purpose of this investigation was to review the US Army's experience in allowing aircrew to take SSRIs. The US Army Aviation Epidemiology Data Registry (AEDR), a family of databases storing medical and occupational history as well as medical and flight physical information on Army aircrew members, was queried for Army aviators with PTSD, anxiety, and/or depression, or who took SSRIs between 2004-2009. The particulars of the Army's policy, including mandatory grounding times when initiating treatment; the implications of SSRI dosing changes; psychiatric evaluation requirements; and waiver policies will be discussed. Recognizing that mental health concerns are greatly under-reported by aircrew, and that the diagnosis, treatment, and waiver of such disorders remain a relatively rare event, we provide our analysis of current trends. We also provide insight into how the aggressive diagnosis and treatment of PTSD, depression and/or anxiety, in a select population such as aviators, can have far-reaching effects in enhancing the human performance and resilience of soldiers exposed to the trauma of war and the stressors of military life in the 21st century.

Report Documentation Page

Form Approved
OMB No. 0704-0188

Public reporting burden for the collection of information is estimated to average 1 hour per response, including the time for reviewing instructions, searching existing data sources, gathering and maintaining the data needed, and completing and reviewing the collection of information. Send comments regarding this burden estimate or any other aspect of this collection of information, including suggestions for reducing this burden, to Washington Headquarters Services, Directorate for Information Operations and Reports, 1215 Jefferson Davis Highway, Suite 1204, Arlington VA 22202-4302. Respondents should be aware that notwithstanding any other provision of law, no person shall be subject to a penalty for failing to comply with a collection of information if it does not display a currently valid OMB control number.

1. REPORT DATE OCT 2009	2. REPORT TYPE N/A	3. DATES COVERED -
4. TITLE AND SUBTITLE A Review of the US Army Experience Using Selective Serotonin Reuptake Inhibitors in Aircrew		5a. CONTRACT NUMBER
		5b. GRANT NUMBER
		5c. PROGRAM ELEMENT NUMBER
6. AUTHOR(S)	5d. PROJECT NUMBER	
	5e. TASK NUMBER	
	5f. WORK UNIT NUMBER	
7. PERFORMING ORGANIZATION NAME(S) AND ADDRESS(ES) US Army Aeromedical Research Laboratory 6901 Farrel Road Fort Rucker, Alabama 36362 USA		8. PERFORMING ORGANIZATION REPORT NUMBER
9. SPONSORING/MONITORING AGENCY NAME(S) AND ADDRESS(ES)		10. SPONSOR/MONITOR'S ACRONYM(S)
		11. SPONSOR/MONITOR'S REPORT NUMBER(S)

12. DISTRIBUTION/AVAILABILITY STATEMENT
Approved for public release, distribution unlimited

13. SUPPLEMENTARY NOTES
See also ADA562561. RTO-MP-HFM-181 Human Performance Enhancement for NATO Military Operations (Science, Technology and Ethics) (Amelioration des performances humaines dans les operations militaires de l'OTAN (Science, Technologie et Ethique)). RTO Human Factors and Medicine Panel (HFM) Symposium held in Sofia, Bulgaria, on 5-7 October 2009., The original document contains color images.

14. ABSTRACT
As many as 300,000 soldiers may suffer from post traumatic stress disorder (PTSD), depression, or anxiety and less than half of them seek care, citing adverse career implications and stigmatization. Aircrew members are particularly prone to under-reporting illness, especially mental health issues, for fear of losing their flight status. Currently the US Army is the only US DoD service that allows aircrew diagnosed with PTSD, anxiety, and/or depression to perform aircrew duties while taking selective serotonin reuptake inhibitors (SSRI). Such use has been allowed with waiver since 2004. The purpose of this investigation was to review the US Army's experience in allowing aircrew to take SSRIs. The US Army Aviation Epidemiology Data Registry (AEDR), a family of databases storing medical and occupational history as well as medical and flight physical information on Army aircrew members, was queried for Army aviators with PTSD, anxiety, and/or depression, or who took SSRIs between 2004-2009. The particulars of the Army's policy, including mandatory grounding times when initiating treatment; the implications of SSRI dosing changes; psychiatric evaluation requirements; and waiver policies will be discussed. Recognizing that mental health concerns are greatly under-reported by aircrew, and that the diagnosis, treatment, and waiver of such disorders remain a relatively rare event, we provide our analysis of current trends. We also provide insight into how the aggressive diagnosis and treatment of PTSD, depression and/or anxiety, in a select population such as aviators, can have far-reaching effects in enhancing the human performance and resilience of soldiers exposed to the trauma of war and the stressors of military life in the 21st century.

15. SUBJECT TERMS					
16. SECURITY CLASSIFICATION OF:			17. LIMITATION OF ABSTRACT SAR	18. NUMBER OF PAGES 6	19a. NAME OF RESPONSIBLE PERSON
a. REPORT unclassified	b. ABSTRACT unclassified	c. THIS PAGE unclassified			

Standard Form 298 (Rev. 8-98)
Prescribed by ANSI Std Z39-18

INTRODUCTION

Recent studies have consistently shown that military service members returning from combat operations in Iraq and Afghanistan have a high incidence of mental health problems (2,3,4,7). In a cohort of over 88,000 US soldiers returning from Iraq, more than 1-in-5 active duty soldiers, and over 40% of reserve component soldiers were identified as requiring mental health treatment (7). Early in the war in Iraq, researchers identified significant risks of mental health problems, but also reported reluctance to seek help due to barriers to care, especially the perception of stigma among those most in need of care (3). Combat duty in Iraq was also associated with high utilization of mental health services and attrition from military service after deployment (2). Aircrew, by the nature of their business, have less exposure to direct ground combat than their combat arms colleagues, yet they are not without behavioral health issues, and they are much more costly to replace. The cost to train a new flight school graduate qualified to fly the CH-47 Chinook, the Army's workhorse in both Iraq and Afghanistan, was over \$508,000 in 2005 (9). Currently, training can take more than 2 years, and further training is required in the unit to reach full mission qualification as a co-pilot. Standardization instructor pilots require over a decade to develop. This tremendous investment in human resources can evaporate with a diagnosis of depression, anxiety or PTSD, as these diagnoses have long been deemed inconsistent with service on flight status in both civil and military aviation (5).

Military aviators as a population tend to be well educated, health conscious and have higher income (due to aviation career incentive pay) than their non-rated contemporaries. Their flight pay is contingent upon maintaining a valid flight physical, and this presents a strong motivation to avoid a diagnosis which is cause for medical grounding. Flight surgeons are taught early in their training that aviators (and flight school applicants) commonly minimize their symptoms, or deny them entirely, a phenomenon known as reverse malingering (6). It is well known that aviators sometimes seek care outside the military medical system, especially when negative consequences attend such care (e.g. venereal diseases in years past), and behavioral health issues unfortunately are still often associated with stigma. Pilots are disinclined to reveal such problems to their flight surgeons. In their 2003 study of fatal civilian aviation accidents, Akin and Chaturvedi described 61 pilot fatalities where post-mortem blood samples tested positive for SSRIs (1). Subsequent analysis found that past SSRI use was found in the medical histories of only seven of the 61 pilots (8). This is noteworthy since flying while taking SSRIs has never been approved by the Federal Aviation Administration (FAA). SSRIs (with or without other drug[s] and/or ethanol) were determined to be a contributing factor in only nine of the 61 fatal accidents. Today's aviator faces a behavioral health conundrum. He must decide whether or not to seek treatment for complaints that may result in a diagnosis such as anxiety, PTSD and depression, with the possibility of losing his medical clearance to fly. Some aviators seek behavioral health care outside the military system, and hide their medical problems from their flight surgeons, as the civilian aviators did in Sen's FAA fatal accident study (8). Historically, a handful of Army aviators have obtained waivers for a history of reactive depression or some other time-limited behavioral health disorder. But psychotropic medications have not been allowed. Flight surgeons desire to use every tool in their medical arsenal to help their patients, but flying while taking SSRIs has been forbidden by virtually all aeromedical waiver authorities (US Army, Navy, Air Force, FAA). Exhaustive (and expensive) in-flight research on SSRIs to prove their aeromedical safety has not yet been accomplished, yet there is a large and growing behavioral health problem impacting aircrew. The risk/benefit decision is whether to carefully waive and observe select aircrew, allowing SSRIs, or to continue to disallow such treatments, with the likely consequence of pushing aviators toward unsanctioned healthcare options. Or worse yet, the prospect of being grounded may cause aircrew to forego treatment entirely, and quietly suffer with their disease when effective and safe remedies exist.

BACKGROUND

The US Army Aeromedical Activity (AAMA) is the tertiary central aeromedical review authority for all Army aircrew members worldwide. The aeromedical physician consultants assigned to AAMA review all flying duty medical exams for rated aircrew and air traffic controllers (ATC) for the Army, to include Department of the Army Civilians who fly and control Army aircraft. This allows for standardization and central collection and storage of all rated aircrew and ATC physicals and waiver requests. AAMA also informs policy with regard to aeromedical waivers for medical conditions and therapies which may present unacceptable aeromedical risk.

The first waiver for SSRI use in US Army aircrew was granted in 2004 for a diagnosis of chronic pain. The aerospace medicine specialists at AAMA were very aware that new and safer pharmacologic agents were available to treat various mental health disorders, but also realized that waiving SSRI use for behavioral health issues could not be done in a cavalier fashion. In 2005, after extensive research into the safety and efficacy of SSRIs, and the similar class, selective monoamine reuptake inhibitors, (SMRIs), AAMA drafted its first SSRI (SMRI) Aeromedical Policy Letter. In June of that year, the policy letter was presented to the Aeromedical Consultant Advisory Panel, a review board of senior aerospace physicians and rated Army aviators, who are charged with rendering aeromedical dispositions on complicated or contentious waiver cases, as well as providing input into recommended aeromedical policy changes. The consensus opinion, and subsequent US Army policy, was that psychiatric conditions such as PTSD, major depression, generalized anxiety disorder and similar diagnoses would continue to be disqualifying for all classes of aviation duty. However, waivers may be considered if specific conditions were met. These conditions include: a detailed clinical interview by a psychiatrist or a psychologist, to include narrative treatment records; a neuropsychological assessment which includes cognitive domains and motor skills testing (e.g. CogScreen®) in order to demonstrate preservation of functional ability; and operational and command endorsement, with the requirement that rated personnel demonstrate proficiency on an in-flight performance evaluation (which may be performed in an aircraft simulator). The in-flight evaluation will not take place prior to at least 3 months on a stable medical regimen. Finally, medication use must be at a stable dose, without aeromedically significant side effects, for at least 4 months prior to waiver submission. When a waiver is recommended and granted, the aviator will continue to follow-up with the treating behavioral health provider as clinically indicated. Waiver follow-up requirements include repeat psychological evaluations at 6-month intervals, for the duration of treatment, to include a 6-month exam after cessation of medication. Additionally, the flight surgeon shall note mental health status on an annual basis to continue the waiver, annotating results on the annual flight physical. Relapse, change in mental health, or return to medication after cessation is disqualifying and will require a new aeromedical summary for assessment and disposition (10).

METHODS

AAMA maintains an exhaustive database known as the Aviation Epidemiology Data Register (AEDR). The AEDR archives the medical history, physical exam and aeromedical board documents of aircrew members and training applicants dating back to the early 1960's, and contains records on over 160,000 individual aircrew and flight school applicants. The AEDR was queried for all aircrew with a history of, or current use of SSRIs (to include SMRIs) from the date of the first granted waiver in January 2004 through March 2009. Demographic data was collected, (e.g., age, gender, aircrew status), and the date and type of the last flight physical, as well as the medical diagnosis for which the SSRI was prescribed, were recorded. These data were gathered without personal identifiers to ensure patient confidentiality.

RESULTS

A total of 195 aircrew records were identified as having a history of use, or current use, of SSRIs (or SMRIs). Of those considered for waiver, 112 (57.4%) were denied. Of the 83 (42.6%) waivers granted, 16 (19.3%) were for initial training applicants. The bulk of the waivers granted (63.9%) were for a *history* of SSRI use, not current usage. Only 30 of the 195 waiver requests were approved for current SSRI use. Sixty-seven males received waivers, compared to 16 females, a ratio of 4:1. The most common diagnosis for which aircrew received a waiver was depression/dysthymia, with 33 cases. Of these waivers, only seven were current cases, and 26 were granted for a history of depression/dysthymia. Similarly, there were 24 adjustment disorder waivers granted, with six being actively treated, and the remaining 18 being recorded as a previous history. The most active current diagnosis was anxiety, with 10 current cases and three recorded as a previous history. There were five waivers granted for currently treated PTSD, with two cases of previous PTSD. Fourteen (16.9%) of the waivers were granted for aviation medicine providers, 12 of whom were flight surgeons and two were aeromedical physician assistants. The average age of a waiver recipient was 35.8 years.

DISCUSSION

While the Army remains the only branch of the US military to allow treatment with SSRIs in its active aviators, SSRI use remains a relatively rare condition. Of the 195 waiver requests considered, 83 waivers were granted. Only 30 (15.4%) were for current use of SSRIs; the remaining 53 waivers were for a history of SSRI use. The most common diagnoses for which the 30 aircrew have been granted a waiver for current SSRI usage are anxiety ($n = 10$), depression ($n = 7$), adjustment disorder ($n = 6$), and PTSD ($n = 5$). Only three initial applicants received a waiver for current use of SSRIs. Less than one in five of all waivers granted were for initial applicants, reinforcing the concept that waivers for SSRI use (or history of SSRI use) tend to be preferentially granted to trained aircrew, where significant resources have already been invested. The average age of all waiver recipients was relatively high, at 35.8 years, again reflecting a bias toward granting waivers to trained and seasoned aircrew.

The male to female ratio of 4:1 is lower than expected, as females make up less than one-sixth of the aircrew population. However, females in this study received waivers for post-partum depression, dysmenorrhea, and pre-menstrual dysphoric disorder, conditions unique to female reproductive health.

A surprising number of waivers were granted to aviation medicine practitioners, 14 of 83 granted waivers, or 16.9%. This may represent a more permissive application of the waiver process given that flight surgeons no longer enjoy much opportunity to fly at the aircraft controls in modernized aircraft requiring two rated aviators at the controls.

SSRI use among US Army aviators remains uncommon, and waiver requests for current SSRI use remain rare. However, the number of waiver requests for a *history* of PTSD, depression or anxiety is not trivial, and is growing. Aviators who fear aeromedical grounding for such diagnoses are often reluctant to share psychological symptoms to their provider. However, having treatment options consistent with continued aviation service is likely to reassure those aircrew who struggle with behavioral health issues and may encourage them to come forward for treatment instead of seeking care outside of the aviation medicine system, or worse yet, foregoing needed care. As more aircrew are treated, and barriers to care (e.g. stigmatization, fear of permanent grounding) are eliminated or lessened, aircrew retention and readiness should improve. An additional benefit could well be the positive impact on other, non-aviation, military personnel as they see their aviation comrades being positively impacted by improvements in mental health access and outcomes.

FUTURE RESEARCH

Additional research is necessary to ensure that those aircrew with a history of PTSD, depression, anxiety and other behavioral health issues are adequately diagnosed and treated without undue aeromedical risk, and that those who meet appropriate criteria are afforded the opportunity to return to the cockpit and control towers to perform aircrew and controller duties. The US Army will continue to longitudinally monitor the flight status and career outcomes of those aircrew who have been granted waivers. The US Army Aeromedical Research Laboratory is conducting additional research on SSRIs and their impact on sleep architecture and performance. Future articles should address military Class A-C accidents, and any role mental health diagnoses or treatment might have played as evidenced by investigation using the Human Factors Analysis and Classification System (HFACS). Finally, further work needs to be done to better elucidate why waivers are denied (e.g. failure to perform well on CogScreen®, continuing behavioral health issues, adverse reactions to medications) so that waivers (and denied waivers) can be consistently and fairly issued, and future behavioral health initiatives can effectively benefit aircrew without compromising aviation safety.

REFERENCES

- [1] Akin A, Chaturvedi AK. Selective serotonin reuptake inhibitors in pilot fatalities of civil aviation accidents, 1990-2001. *Aviat Space Environ Med* 2003; 74:1169-76.
- [2] Hoge CW, Auchterlonie JL, Milliken CS. Mental Health Problems, use of mental health services, and attrition from military service after returning from deployment to Iraq or Afghanistan. *JAMA* 2006; 295:1023-1032.
- [3] Hoge CW, Castro CA, Messer SC, McGurk D, Cotting DI, Koffman RL. Combat duty in Iraq and Afghanistan, mental health problems, and barriers to care. *N. Engl. J. Med* 2004; 351:13-22.
- [4] Hoge CW, McGurk D, Thomas JL, Cox AL, Engel CC, Castro CA. Mild traumatic brain injury in U.S. soldiers returning from Iraq. *N. Engl. J. Med* 2008; 358:453-463.
- [5] Jones Dr, Ireland RR. Aeromedical Regulation of Aviators Using Selective Serotonin Reuptake Inhibitors for Depressive Disorders. *Aviat Space Environ Med* 2004; 75:461-70.
- [6] Kennedy CH, Zillmer EA, eds. *Military Psychology: Clinical and Operational Applications*. New York: The Guilford Press, 2006, 49.
- [7] Milliken CS, Auchterlonie JL, and Hoge CW. Longitudinal assessment of mental health problems among active and reserve component soldiers returning from the Iraq War. *JAMA* 2007; 298:2141-2148.
- [8] Sen A, Akin A, Canfield DV, Chaturvedi AK. Medical histories of 61 aviation accident pilots with post-mortem SSRI antidepressant residues. *Aviat Space Environ Med* 2007; 78:1055-1059.
- [9] Wesolek ML. Evaluation of the effectiveness of Flight School XXI, US Army Research Institute Technical Report 2007; 1197:22.
- [10] US Army Aeromedical Policy Letters and Aeromedical Technical Bulletins, Fort Rucker, AL: Retrieved July 26 2009 from: <https://aamaweb.usaama.rucker.amedd.army.mil/AAMAWeb/p4.html>

