

2016

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## Recommended Citation

Gourley, Shawn J. (2016) "Possible Causes of Increased Domestic Violence among Military Veterans: PTSD or Mefloquine Toxicity?," *Montview Liberty University Journal of Undergraduate Research*: Vol. 2: Iss. 1, Article 9.  
Available at: <http://digitalcommons.liberty.edu/montview/vol2/iss1/9>

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Possible Causes of Increased Domestic Violence among Military Veterans: PTSD or Mefloquine

Toxicity?

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### Abstract

After more than a decade at war, our returning service members and their families are facing enormous amounts of difficulty when returning home. PTSD and TBI, the signature wounds of these wars, have been well covered in the media. The family struggles have remained hidden and mostly undiscussed. These families are facing very specific issues in military relationships like infidelity, substance misuse, and intimate partner violence; the latter of which military families are three times more likely to experience when compared to the civilian population. There is a potential effect on caregiver burden in the role of PTSD as a factor for relationship difficulties as well. Many times, spouses can struggle with no longer being just a wife; they have become full-time, exclusive caregivers. This loss of personal identity is one of many things that can cause a cascade of mental health problems for the spouse. As much as spouses are excited to have their service member home, incorporating the service member back into the family can be stressful. Spouses may be taken off guard to find themselves experiencing deep sadness at the changes they perceive in their veteran. These are some of the more common relationship issues in a marriage where PTSD is present. Yet there seems to be a darker side to all of this. With the higher rates of domestic violence, this paper is researching the possibility of being wrong about PTSD or potentially there may be some previously unrecognized confounder that has not been looked at yet. Mefloquine is an anti-malaria pill given to our military members, that is already known to confound the diagnoses of PTSD and TBI. This literature review will assess the possibilities of what could be making veterans more violent.

## Possible Causes of Increased Domestic Violence among Military Veterans: PTSD or Mefloquine Toxicity?

Service members and their families are facing monumental struggles as more and more veterans return home from war. Some of the struggles couples are facing include Post Traumatic Stress Disorder (PTSD), Traumatic Brain Injury (TBI), relationship issues, addictions, parenting issues, divorce, criminal trouble, and domestic violence. This literature review of collected research and analysis will focus if PTSD can make veterans dangerous to their family, or if there is a better explanation.

### **Background**

It is well known that the military operates in its own world, by its own rules, very much separate from the civilian community. The military does not always conform to the civilian part of society, and the military view on domestic violence is no exception. Unfortunately, that puts many military and veterans in a situation where they may not realize their actions are considered domestic violence in the civilian community because that same action was seen as acceptable in the military. Many times what is seen as domestic violence in the civilian community is rated at a much milder level or not at all. An example of this would be that most instances of emotional or verbal abuse do not qualify as a UCMJ offense. The military also uses tiers to rate the severity of abuse which places a heavy focus on physical abuse and a very limited view of emotional abuse (Stamm, 2009, p. 330). These tier categories do not align with the civilian definition of dangerous abuse. An example of this mismatch in the severity of abuse would be strangulation. Strangulation is a regular part of military training but is also a common part of domestic violence; this could be a deadly combination for military families (Bergin & Berkowitz, 2012, p. 19). A strangulation case in the civilian community is considered very dangerous, whereas, in the

Department of Defense, it might be defined as mild to moderate abuse. These differences between rules, laws, and cultures often put the soldiers at a disadvantage when re-entering civilian life after service.

Military as an occupation is significantly different from civilian occupations. This population has been trained to engage in violence over the course of their military career. The military training combines stimulus response training with psychological inoculation which teaches personnel to suppress normal instinct and attack without hesitation, quickly, and dispassionately (Hafemeister & Stockey, 2010). While service members are trained to use only the level of force that is necessary to subdue a threat and ensure survival many times for veterans with PTSD, the lines may be blurred, and veterans may react to a threat at home the same way they would a threat at war (Sayers, 2011). Unfortunately, there are a very limited amount of studies and research on military training and the effects on domestic violence. However, there are a large number of studies that link mental disorders to domestic violence.

### **Impact on Family**

In a recent study, it showed a veteran's PTSD caused higher rates of marital distress, separation, and had an adverse impact on the family mental health and marital happiness (Vasterling et al., 2015). A few of the more difficult issues military families deal with are divorce and infidelity which are two times more likely in veterans compared to civilians (London, Allen, & Wilmots, 2013). It is important to note that approximately 50% to 60% of military couples seek marital counseling due to infidelity, and that infidelity can cause PTSD like symptoms in the nonparticipating spouse (Moore, 2012).

There is a wealth of research showing the correlation between military families and domestic violence (LaMotte, Taft, Weatherill, Scott, & Eckhardt, 2014). The Department of

Veterans Affairs (VA) conducted a study where 58% of Vietnam veteran's currently impatient, admitted to committing domestic violence since leaving the military (Jones, 2011). Civilian couples, they have found experience domestic violence at a rate three times lower than military couples (Blow, Curtis, Whittenborn, Gorman, 2015). Trevillion (2015), evaluated ten different studies of military personnel and found that 91% of service members have admitted to committing acts of verbal abuse and 27% have admitted to committing physical abuse.

One of the more shocking findings was the data that the VA collected from 21 states on suicide statistics. According to the VA, the data showed that 22 veterans committed suicide every day (Kemp & Bossarte, 2012, p. 15). The suicide rate and domestic violence rates being extremely high are bothersome. The aforementioned research indicates that veterans who exhibit PTSD symptomatology are at a significant risk for perpetrating domestic violence or suicide. Knowing these statistics, it is important to investigate factors that may help to explain the occurrence of violent tendencies, in particular, domestic violence and suicide, in the military population.

### **Is PTSD Correct?**

PTSD is a psychiatric condition that can occur following the experience or witnessing of a traumatic event. The traumatic events are normally considered something so severe that any person would feel distressed. Richard Bryant (2015) states, "DSM-IV defined PTSD as having been exposed to or witnessing a severely threatening experience and responding with fear, horror or helplessness. This was the gatekeeper to the diagnosis because only if these experiences were present could one then consider the re-experiencing, avoidance and arousal symptoms" (pp. 314-315). It is significant to note that PTSD is the only DSM condition for which the occurrence of a stressor is part of the diagnosis (Schiraldi, 2009).

### **PTSD Controversy**

Prior the release of the DSM 5 in 2013, the categorization of PTSD was heavily debated. PTSD has now been moved from being listed as an anxiety disorder to the new category of Trauma and Stress-Related Disorders. The DSM 5 clarified that a qualifying stressor can include seeing a loved one hurt, sudden loss of loved ones, hearing of a family member death, or even losing a child, by refining the definition of trauma to include actual or threatened exposure to death, serious injury, or sexual violation. The A2 criteria, emotional response of fear, helplessness, and/ or horror, has been removed because not all who endure a traumatic event experience these emotions. The A2 criteria, “had been initially introduced, in part, to ensure that minor reactions to events would not qualify for a PTSD diagnosis” (Bryant, 2015, p. 319).

There is a long and well-established history of “traumatic” events that are considered life threatening and PTSD. Recently, research is exploring the possibility that non- traumatic events could cause PTSD symptoms also. Currently, there are a growing number of supporters for broadening the definition of traumatic event to include any event that causes PTSD symptoms, instead of being limited to a life-threatening event. Many of these advocates argue that an individual’s perception of the event is what defines what is traumatic and what is not traumatic (Friedman, Resick, Bryant, & Brewin, 2011). This argument is based on what has already proven in multiple studies where infidelity nonparticipating spouses show extremely high rates of PTSD absent the defined criteria of “involving an actual or threatened death or serious injury” (Gordon, K. C., Baucom, D. H. and Snyder, D. K., 2004, p. 225; Dean, 2010). In another study on betrayal, Rachman (2010), found that betrayal can cause PTSD like symptoms stating, “[s]ome post-betrayal effects are PTSD-like, and attention is drawn to a range of ‘non- physical’ trauma, such as betrayal, in which there is no injury or threat of serious injury, but the effects can be

catastrophic” (p. 305). Becker-Blease and Freyd (2005) explain, “the amount of betrayal in an event was more predictive of most negative symptoms than the amount of terror and fear” (p. 405). In a recent review of the DSM5, in reference to defining trauma which according to the author has been controversial since DSM-III. The study points out, “[w]hile the DSM-5 was careful to highlight variability in presentations, research indicates that limiting trauma to actual or threatened death or injury may be overly restrictive” (Guina, Welton, Broderick, Correll, Peirson, 2016, p. 4).

### **PTSD and Violence**

According to the National Center for PTSD, studies suggest that the association between PTSD and violence is especially strong in this Veteran group with an average of 19.5% of veterans compared to 7.5% of civilians committing acts of violence (National Center for PTSD, 2015). Sayers (2011) points out, “[t]here are other behavioral factors that are adaptive in the context of a military combat deployment and general military environment but that are maladaptive or inappropriate in civilian and family life.” (p. 108). It has been found that domestic violence with veterans is distinctively different than most patterns of domestic violence (Galovski, Lyons, 2004). The difference is explained as “[u]nlike the chronic cycle of ongoing abuse often reported in the general domestic violence literature, the veteran may commit only one or two extremely violent and frightening abusive episodes that quickly precipitate treatment seeking” (Galovski, Lyons, 2004, p. 481). Results from a recent study show that in participating veterans, both men and women, “emotional deregulation fully accounted for the relationship of PTSD symptoms and impulsive aggression” (Miles, Menefee, Wanner, Tharp, & Kent, 2015, p. 14). This finding is significant when some spouses indicated that the violence would have never happened if the veteran did not have PTSD (Finley, Baker, Pugh, & Peterson, 2010).



Unfortunately, it is being found in studies that domestic violence is not one-sided in this population. In a shocking 2014 study it was found, “[c]ontrary to expectations, findings indicated that the partners of OIF/OEF veterans perpetrated more physical IPA than did the veterans themselves” (LaMotte, Taft, Weatherill, Scott, & Eckhardt, 2014, p. 13). Then, in a new study in 2015, LaMotte and team duplicated the results of the previous study and found that the veterans’ IPV was directly related to their PTSD symptoms, but the spouses’ IPV was not related to their PTSD symptoms (LaMotte, Taft, Weatherill, Scott, & Eckhardt, 2015, p. 152). Even though having PTSD puts individuals at higher risk for violence, the National Center for PTSD states that an “[i]ndividuals with PTSD are not dangerous” (National Center for PTSD, 2015).

### **Mefloquine**

Mefloquine, also known as Lariam, is an anti-malaria drug discovered by researchers at Walter Reed Army Institute of Research (WRAIR) following a 10-year drug discovery testing over 300,000 different chemical compounds (Ritchie, Block, & Nevin, 2013, p. 224). Mefloquine belongs to the drug family class, quinoline. Mefloquine Hydrochloride is a quinoline methanol derivative chemically related to quinine (World Health Organization [WHO], 1989). The first quinoline derivatives, which are closely related to mefloquine, were initially abandoned for more than a decade. These quinoline compounds were deemed unsafe as the result of early human tests during the military’s WWII antimalarial drug discovery program which demonstrated: “unacceptable toxicity, causing symptoms of “nervousness,” “lassitude,” or confusional or paranoid psychosis, and extensive neurotoxic lesions through-out the brainstem and limbic system in humans” (Nevin, 2014, p. 278). Due to chloroquine-resistant *P. falciparum* malaria, drug testing resumed until mefloquine was synthesized in the 1960s.

After all the research, mefloquine was the only drug to be selected for further testing in the 1970s. Despite the previously known dangers of similar quinoline compounds, mefloquine was assumed to be safe based on the results of testing on prisoners, “which indicated the drug was free of the serious psychiatric side effects, including suicide and psychosis that had characterized related quinoline antimalarials” (Nevin, 2014, p. 279). Due to the US Military being forbidden by Congress to engage in commercial activities, all of the research and intellectual property rights were transferred to Roche at no charge. During the pre-license phase, the drug was tested on U.S. military, prisoners, and subjects in third world countries before being FDA approved in 1989 at a 250mg dosage (Ritchie et al., 2013, p. 224).

### **Mefloquine Link to Violence**

When the first claims started coming in about potential severe reactions to mefloquine, including reports of hallucinations, psychosis, and suicidal thoughts, the drug’s purported safety had been so well established that they were dismissed. It would not be until the drug had been on the market for 15 years before the drug’s psychotropic capabilities would start to be appreciated. In 2001, the first double-blinded randomized controlled trial finally began, despite being warned years prior, in 1996, by U.S. Special Forces spouses about the “drastic changes” after their soldiers took mefloquine (Nevin, 2014, p. 280; Ritchie et al., 2013, pp. 224-25).

In 2002, mefloquine raised questions in the media when multiple homicides and corresponding suicides occurred at Ft. Bragg within a few short weeks. Two soldiers murdered their wives then immediately took their own lives as well. A third soldier murdered his wife and then a year later committed suicide while in prison. All three soldiers had recently returned home from Afghanistan and were known to have taken mefloquine. The Army conducted an investigation confirming the first two soldiers had documented use of mefloquine. Documented

usage could not be found for the third soldier, despite other unit members confirming that he had taken mefloquine. The family also stated that since returning home, the third soldier displayed strange behavior, paranoia, and fits of rage that were uncharacteristic of him. A formal investigation by the Army failed to rule out mefloquine as the cause of violence in at least two cases where documented prescription existed. In the third case, drug usage could not be substantiated and in the fourth unrelated case, there was no history of deployment or prescription, so the Army concluded that the drug was “unlikely to be the cause of this clustering.” (Nevin, 2013).

Although, the Ft. Bragg incident was ruled as “marital issues,” in light of more than a decade of research and what is now known about mefloquine, raises the question if the murders should be reinvestigated. In a recent study, it shows mefloquine listed in the top 10 medications linked to violent behavior. Moore found mefloquine was 9.5 times more likely to be associated with violence (including homicide and suicide) than other drugs (Moore, Glenmullen, & Furberg, 2010). One study showed, “mefloquine is strongly associated in postmarketing studies with risk of violence towards others, including homicide” (Nevin, 2015, p. 3).

### **Mefloquine Link to Suicides**

In 2006, a case study of a 27-year-old male subject who had committed suicide revealed that the man was found covered with knife wounds in his home. The study showed that “[t]he autopsy report concluded that death was due to a craniocerebral wound from a violent blow” (Jousset et al., 2010, p. 379). Although homicide was suspected initially, suicide due to mefloquine was suggested. The toxicological analyses confirmed that the suicide was a “severe neuropsychiatric reaction to treatment with mefloquine” (Jousset et al., 2010, p. 378). Nevin made this observation as well: “Symptoms of derealization and depersonalization, compulsions

toward dangerous objects, and morbid curiosity about death may accordingly underlie reports of seemingly spectacular and impulsive suicide, suicide attempt, and parasuicidal behavior associated with the use of mefloquine” (Ritchie et al., 2013, p. 226).

Croft (2007) showed that there is a casual association with 19 deaths including three suicides. In a more recent study, mefloquine is said to be a serious concern associated with suicides. This concern, as stated in the study, dates back to the 2003 large scale deployment of military personnel to Iraq where mandatory mefloquine usage was widespread and increased risk of suicides was observed (Nevin, 2015). Of important note, in 2012, the DoD released a report with the following findings for suicides in 2011: 42% had known use of psychotropic medications and 84% had never seen combat (DoD, 2012, p. 18).

### **Mass Prescription of Mefloquine in Detainees and Military**

On June 9, 2006, three Guantanamo Bay detainees committed suicide. Through the numerous investigations resulting from these suicides, mefloquine and the dark history of this drug would finally fully come to light. In an analysis of the mass administration of mefloquine to Guantanamo detainees was published highlighting the widespread inappropriate mass prescription of mefloquine to military personnel stating the findings:

One possibility is that the use of mefloquine was simply erroneously directed by senior US military medical officials overly confident of the drug’s safety and unfamiliar with its appropriate use, in an apparent foreshadowing of its later, broader misprescribing among US military personnel (Nevin 2010). Another possibility, which is deeply troubling to consider, is that the decision to administer the drug was informed and motivated at least in part by knowledge of the drug’s adverse neuropsychiatric effects and the presumed

plausible deniability of claims of misuse in the context of its seemingly legitimate clinical or public health indication. (Nevin, 2012, p. 1285)

The military justified the misprescribing of mefloquine to an increase of malaria in military personnel, thus, the drug was given as a preventative measure to military service members deploying to Afghanistan and Iraq (Nevin, 2010). Seton Hall School of Law Center for Policy and Research published a report that explained the CIA had experimented with mefloquine's drug family, quinoline, in the 1950s and 1960s that studied, "psychotropic drugs for behavioral modification for use as a weapon and interrogation tool" (Denbeaux et al. 2010). In the task report, "Ethics Abandoned: Medical Professionalism and Detainee Abuse in the "War on Terror" (2013), briefly discussed the unexplained administration of the anti-malaria drug mefloquine with neuropsychiatric side effects to the detainees have raised questions pointing out:

[S]ome medical practices were highly questionable, including the unexplained use of the anti-malarial drug mefloquine, which may have significant mental side effects. Mental health care appears to have been especially deficient. Despite the psychological deterioration of detainees at Guantánamo in 2002 and 2003, evidenced by more than 350 acts of self-harm in a single year, available medical records show no official clinical investigations of the circumstances or causes of the detainees' suffering. diagnoses of post-traumatic stress disorder were made by independent medical evaluations arranged by lawyers for detainees. (p. xix)

### **PTSD Malingering or Mefloquine an Unrecognized Confounder**

In 2004, the VA issued an internal letter warning that a number of anecdotal and media reports had suggested that mefloquine had caused more serious effects including violent and suicidal behavior. The letter also noted that mefloquine caused symptoms similar to Post-

Traumatic Stress Disorder. In the letter, the VA stated, “[s]ide effects may include anxiety, paranoia, depression, agitation, restlessness, mood changes, panic attacks, forgetfulness, hallucinations, aggression, and psychotic behavior” (Perlin, 2004).

Currently, there are numerous studies that show many of mefloquine’s reported adverse neuropsychiatric effects are consistent with key PTSD diagnostic criteria including “intrusion or re-experiencing” (Criterion B), “negative alterations in mood or cognitions” (Criterion D), “increased arousal symptoms” (Criterion E) and “may be persistent” (Criterion F) in cases of long-term or permanent neuronal injury (Nevin, 2014, pp. 283-84). The U.S. Centers for Disease Control are now advising that mefloquine’s “neuropsychiatric side effects may confound the diagnosis and management of post-traumatic stress disorder and traumatic brain injury” (Magill, 2012, Chapter 8). This could mean that many of the military personnel experiencing symptoms of mefloquine neurotoxicity may have appeared to meet the PTSD diagnostic criteria regardless of whether or not a traumatic event caused their symptoms.

In a recent interview a V.A. psychologist who treats PTSD was quoted. The article states, “[i]t’s an open secret that a large chunk of patients are flat-out malingering,” said Christopher Frueh, a University of Hawaii psychologist who spent 15 years treating PTSD in the VA system.” (Zarembo, 2014). In a review addressing how the changes to the DSM5 could potentially affect those who have served in the military it is stated that as high as 75 % of PTSD claims are possibly malingering (Guina, Welton, Broderick, Correll, Peirson, 2016). Although, the review warns, “[h]owever, these numbers are controversial and the VA/DoD system has been criticized for over-emphasizing malingering, which has resulted in increased standardization of PTSD evaluations” (Guina, Welton, Broderick, Correll, Peirson, 2016, p. 4).

Recently Nevin warns, “[c]onversely, in cases where exposure to traumatic events have been ruled out, but where certain chronic symptoms appear to mimic those of PTSD, the clinician must avoid hastily assigning a diagnosis of malingering, or conversion, or factitious disorder, which may have been considered to explain previously unexplained symptoms” (Nevin, 2015, p. 271). The preceding concept is proven in the case study of a 33- year-old soldier who had deployed to Iraq in 2003. The soldier was taken to a combat stress unit after displaying symptoms of paranoia, anxiety, hallucinations, and dizziness for four days. He was said to have suffered combat stress reaction and was sent home. Upon his return to the US, he was charged with cowardice. Months later, an Ears, Nose, and Throat specialist diagnosed the soldier with vestibular injury and likely mefloquine toxicity stating “Brainstem Injury suspected.” All of the charges were then dropped, and the soldier was medically retired and diagnosed with PTSD (Nevin, 2014, pp. 285-286).

### **Mefloquine Around the World**

This phenomenon is not restricted to just the U.S. military; the effects of mefloquine are being seen worldwide. The Irish Medicines Board (2013), sent out updated product information to be used both as a guideline for clinicians and an alert for patients that read:

Lariam may induce potentially serious neuropsychiatric disorders. The most common neuropsychiatric reactions include abnormal dreams, insomnia, anxiety, and depression. Additionally, hallucinations, psychosis, suicide, suicidal thoughts and self-endangering behaviour have been reported. Patients should be advised that if they experience a neuropsychiatric reaction such as suicidal thoughts; self-endangering behaviour; anxiety; feelings of restlessness, confusion, or mistrust towards others; visual/ auditory

hallucinations; depression; or changes to their mental state during treatment, they should stop taking Lariam immediately and seek medical advice immediately. (p. 1)

The Australian military has also been affected. In a recent submission to the Senate Foreign Affairs, Defense and Trade References Committee Inquiry into the Mental Health of Australian Defense Force Serving Personnel, Major McCarthy (2015) argued:

To its credit, both the Australian Defence Force (ADF) and Department of Veterans Affairs (DVA) have made significant improvements in recent years in supporting veterans experiencing mental health problems such as PTSD. These include efforts to reduce the stigma surrounding mental health and psychiatric treatments for PTSD.

Unfortunately, PTSD/anxiety/depression has become a “diagnosis of convenience” which not only prevents those veterans with more complex neuro-psychiatric illnesses caused by TBI and/or neurotoxic drugs from receiving proper care and support, but exacerbates their illnesses and in some cases leaves them and their families alienated from adequate support. There is an over-simplistic focus among policy makers and medical staff on exposure to traumatic events during deployments resulting in PTSD, while many veterans with more complex illnesses with more complex causes are being misdiagnosed, mistreated, and/or failing to receive proper care. (p. 1)

Major McCarthy (2015) goes on to explain that even after providing his doctor information on mefloquine it still took 12 months of “repeated requests to be referred to a neurologist, during which time I was counselled for “anger issues” and threatened with disciplinary action” (p. 5). Major McCarthy’s own testimony to the Australian Senate (2015), he discusses how the drug is linked to multiple suicides, multiple murders, and multiple war crimes. Dr. Quinn, a neuropsychologist who lost her husband to suicide assumed to be related to



mefloquine gives testimony to the fact that there is a general lack of acceptance mefloquine toxicity exists. Quinn stresses, “[d]rugs that are administered for standard post-traumatic stress disorder can often exacerbate the clinical symptoms of mefloquine toxicity due to the underlying neurological damage. Therefore, a correct diagnosis is key” (Mental health of returned Australian Defence Force personnel, 2015, p. 44). Quinn also discusses the parts of the brain affected by mefloquine toxicity:

The parts of the brain that it works on are the areas of the brain that are affected in the chronic disease state caused by mefloquine toxicity, which can be described as a limbic encephalopathy, with vestibulopathy—if you will pardon the long terms. That basically translates to a disorder of the part of the brain that governs anxiety, fear and normal cognitive processing, associated with the part of the brain that deals with balance. A majority of symptoms that have been presented in long-term chronically affected individuals are rage, extreme anxiety, paranoia, auditory or visual hallucinations, vestibular disorder—balance disorders, tinnitus. In a military setting, a lot of those kinds of neuropsychiatric side effects really cross-reference very closely with those that present in PTSD, for example. There has been some concern in the medical profession that there is a subset of individuals whose clinical symptoms of PTSD are exacerbated by having taken mefloquine or that their disease state is actually caused by the drug they have taken and not by classic PTSD at all. (Mental health of returned Australian Defence Force personnel, 2015, p. 46)

### **Conclusion**

From the above literature, it is difficult to say exactly what is causing increased violence in veterans due to mefloquine confounding the diagnosis of PTSD. However, the literature does

support mefloquine as being a possible cause of increased violence in veterans. In a recent study that found acute exposure to mefloquine can induce symptoms of mood disturbance questions why “[g]iven the notable evidence of significant pharmacodynamic and toxicodynamic effects of mefloquine in the brain, it is surprising that so few studies have directly explored its behavioral effects” (Holden et al. 2015, p. 2). Not diagnosing PTSD correctly can have a serious negative outcome on not just the veteran but their family as well. Mefloquine toxicity, although hard to diagnose, needs to be considered especially in noncombat veterans. Veterans have a hard enough time asking for help as is. Ashley and Brown (2015) found that, “[c]ombat and non-combat veterans are less accepting of non-combat veterans’ help-seeking behavior, viewing non-combat veterans as being not resilient and non-deserving of help due to not being a combat veteran” (p. 541). Combat veterans have a deep fear of being perceived as weak by others, (Hooyer, 2015), and will even attack other veterans if that fear gets triggered. Having adequate and appropriate testing for mefloquine toxicity could encourage many veterans who are ashamed of having PTSD and never being in combat to come forward and get help.

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