ClinicSearch

International Journal of Clinical and Medical Case Reports

Izabela Oana Stoica *

Open Access

Review Article

Possible Lnfections to Military Personnel Performing External Missions

Izabela Oana Stoica *

Medical Analysis Laboratory, Constanta Military Emergency Hospital, B-dul Tomis 96, Romania.

***Corresponding Author**: Izabela Oana Stoica, Medical Analysis Laboratory, Constanta Military Emergency Hospital, B-dul Tomis 96, Romania.

Received Date: March 01, 2023; Accepted Date: March 08, 2023; Published Date: March 15, 2023.

Citation: Izabela Oana Stoica, (2023) Possible Lnfections to Military Personnel Performing External Missions, *International Journal of clinical and Medical Case Reports*, 2(2); **Doi:10.31579/2834-8664/016**

Abstract

Military personnel carrying out foreign missions in countries such as Mali or Afghanistan are exposed to the risk of transmission of endemic diseases existing in those areas: hepatitis, malaria, HIV/AIDS, parasitic diseases (parasites, salmonella, etc.)

Key Words: hiv/aids; emergency; hepatitis; malaria

Introduction

Military personnel carrying out foreign missions in countries such as Mali or Afghanistan are exposed to the risk of transmission of endemic diseases existing in those areas: hepatitis, malaria, HIV/AIDS, parasitic diseases (parasites, salmonella, etc.)

Viral hepatitis is an inflammation of the liver due to viral infections. The most common types of viruses that cause viral hepatitis are hepatitis B virus (HBB) and hepatitis C (1] hepatitis. HBB and HB have a common way of transmitting, such as the parenteral path and insecure sexual relations. Viral hepatitis is a significant problem of public health, especially in poor resources. Annually, about 500,000-700,000 people die as a result of HBB infection and over 350,000 people due to HCC liver disease [2-4]. Worldwide, over 240 million people are chronically infected with HBB [5, 6] and 150 million people with VHC [2].

In most cases, the military lives in military camps that can contribute to their predisposition to the transmission of HB and HC through some common routes. The risk of sharing utensils, such as hair brushes, comb, shaving appliances and toothbrushes is common among people living in groups who can facilitate viruses' transmission [7]. Moreover, the soldiers usually travel from place to place for various professional reasons and stay more apart from their family. This can force the soldiers to have more sexual partners who can expose them for different sexually transmitted infections (ITS), including SHB and SHC.

Chronic infection with hepatitis B virus (SWB) affects over 250 million people worldwide, which exposes them to a high risk of developing serious liver disease, including liver cancer, an extremely severe form of cancer for whom scientists They have not yet found an effective treatment. Although several antiviral treatments can effectively inhibit HBB replication, they are not curative and do not completely remove the virus. Therefore, it is important to remove the virus in chronic carriers, so as to prevent the development of the disease in cancer. When the viruses infect the cells, they use cellular cars, in other words the built -in cell multiplication mechanisms. To combat viruses, some cellular proteins are capable of interfering with these mechanisms. They are known as viral restriction factors. Scientists at the Pasteur Institute postulated that a protein mainly produced in several organs, including the liver, could take over the role of a restriction factor. DNASE I, considered a new factor of antiviral restriction, is expressed in vitro in a hypoxic environment (impoverished by oxygen) and also in patients infected with hepatitis B virus [8].

Malaria is an acute febrile disease caused by Plasmodium parasites, which are spread to humans through the bites of infected female Anopheles mosquitoes. There are 5 species of parasites that cause malaria in humans, and 2 of these species – P. falciparum and P. vivax – pose the greatest threat. P. falciparum is the deadliest malaria parasite and the most widespread on the African continent. P. vivax is the dominant malaria parasite in most countries outside of sub-Saharan Africa. According to the latest World Malaria Report, there were 241 million cases of malaria in 2020, compared to 227 million cases in 2019. The estimated number of deaths from malaria was 627,000 in 2020 – an increase of 69,000 deaths compared to the previous year. While approximately two-thirds of these deaths (47,000) were due to disruptions during the COVID-19 pandemic, the remaining one-third of deaths (22,000) reflect a recent change in WHO's methodology for calculating malaria mortality (regardless of from the disruptions caused by COVID-19). The new cause-of-mortality methodology was applied to 32 countries in sub-Saharan Africa that account for approximately 93% of all malaria deaths globally. Applying the methodology showed that malaria has taken a considerably higher toll on African children every year since 2000 than previously thought. The WHO African Region continues to bear a disproportionately high share of the global malaria burden. In 2020, the region recorded 95% of all malaria cases and 96% of deaths. Children under 5 accounted for approximately 80% of all malaria deaths in the region

Over the past 2 decades, expanded access to WHO-recommended malaria prevention tools and strategies—including effective vector control and the use of preventive antimalarial drugs—has had a major impact on reducing the global burden of this disease. Progress in global malaria control is threatened by emerging insecticide resistance among Anopheles mosquitoes. According to the latest global malaria report, 78 countries

reported mosquito resistance to at least 1 of 4 classes of commonly used insecticides between 2010 and 2019. In 29 countries, mosquito resistance has been reported to all major classes of insecticides. Preventive chemotherapy is the use of drugs, either alone or in combination, to prevent malaria infections and their consequences. From October 2021, WHO also recommends widespread use of the RTS,S/AS01 malaria vaccine among children living in regions with moderate to high transmission of P. falciparum malaria. The vaccine has been shown to significantly reduce malaria and fatal severe malaria among young children. [9].

Intestinal parasitic infection is one of the major health problems globally and up to 3.5 billion people are infected and about 450 million people are sick due to intestinal parasites. Most of these intestinal parasitic infections are concentrated in developing countries. The problem is more serious in Sub-Saharan Africa, Asia and Latin America, associated with inadequate water supply, environmental sanitation, rapid population growth and other economic and social problems [10]. The high prevalence of intestinal parasitic infection in the region is associated with personal hygiene, socio-economic status and educational level of the community. Contamination of the drinking water source, poor personal hygiene and lack of regular hand washing habits are major factors contributing to the increase in Blastocystis hominis and E. histolytica/dispar infection. Lack of shoe protection is known risk factors to increase the chance of hookworm and S. stercoralis infection. [11].

Mali and Afghanistan are countries at high risk of contracting major infectious diseases: HIV, HBV, HCV, malaria, diarrheal diseases or arthropod-borne diseases. The prevalence of these infections is changing and it is necessary to identify the risk factors associated with each infection in Mali to improve health care.

A cross-sectional study of all blood donors (n = 8207) in 2018 at the Bamako University Hospital blood bank in Mali, to assess the prevalence and risk factors associated with HIV, HBV, HCV and syphilis infections to the following conclusions:

* HIV seroprevalence was 2.16% and increased significantly with age
* The prevalence of HBsAg was 14.78% and is higher in men;
* HCV prevalence was 2.32%, higher in the population living outside Bamako;
* Syphilis seroprevalence was very low (0.04%), with only 3 people infected. [12].

Afghanistan has an evolving health infrastructure, and blood donor data is the only published source of population-based prevalence data. From March to December 2006, the Central Blood Banks of Afghanistan reported the prevalence of transfusion-related infections based on a single screening test protocol. For Kabul province, a low prevalence of HIV antibodies (0.0006%) was reported suggestive of syphilis (VDRL 1.1%), HBsAg (3.9%) and hepatitis C (anti-HCV) antibodies (1, 9%), with the prevalence of HBsAg. [11]. Of all diseases, malaria is the leading cause of death in the two regions, especially for children under 5 years of age. Malaria is caused by single-celled microorganisms of the Plasmodium group. The disease is caused by infected Anopheles mosquito vectors and is widespread throughout much of sub-Saharan Africa, Asia and Latin America. In 2019, there were 229 million cases of malaria worldwide, resulting in approximately 409,000 deaths. About 94% of cases and deaths occurred in sub-Saharan Africa. Disease rates decreased from 2010 to 2014 but increased from 2015 to 2019. Malaria is frequently associated with poverty and has a significant negative effect on economic development in Africa. [13]. The prevalence of malaria among children under five was 36% as of 2015. Plasmodium falciparum is the main cause of infection.

Aproximativ jumătate din populația Afganistanului trăiește în zone cu risc de transmitere a malariei. Două specii de malarie (Plasmodium vivax și Plasmodium falciparum) sunt o povară majoră a bolii - în 2011, peste 300.000 de cazuri confirmate. Aproximativ 80-95% din malarie este P. vivax [18].

Unele dintre cele mai frecvente boli alimentare sau transmise prin apă includ diareea (bacteriană și protozoare), hepatita A și febra tifoidă, toate acestea reprezentând amenințări grave pentru comunitățile și teatrele de operații din regiunile endemice. În ciuda îmbunătățirii salubrității, a siguranței alimentare și a altor intervenții în domeniul sănătății publice, s-a înregistrat o reducere minimă a incidenței acestor boli: de exemplu, între martie 2003 și iunie 2006, s-au înregistrat aproximativ 146 de cazuri la 1.000 de persoane. Deși a existat o scădere a incidenței, nu există nici o îndoială că diareea, dizenteria și gastroenterita au fost și sunt încă un eveniment comun în Africa Centrală [14].

Numeroase studii civile au evaluat bolile legate de călătorii în Africa. Rețeaua de supraveghere geosentină a evaluat 5.899 de călători în Africa de Vest (1997-2011) și a raportat șase decese cauzate de infecții (cinci din cauza infecțiilor severe *P.* malarie *falciparum* și una din *Mycobacterium tuberculosis* cu prezentare pulmonară și extrapulmonară). Primele trei cauze ale bolilor au fost malaria (25%), sindromul viral fără erupție cutanată (7%), și diareea acută nespecificată (6%). Alte boli diagnosticate au inclus schistosomiasis (83 cazuri), strongyloidiasis (64 cazuri), hepatita A (13 cazuri), febră tifoidă (25 cazuri), răni muscatura care necesită profilaxia rabiei (22 cazuri), dengue (48 cazuri), tuberculoză (31 cazuri), și HIV acută (14 cazuri). Dintre cei cu febră la întoarcerea din călătorie (2.607), aproape 70% au fost diagnosticați cu malarie. Un alt studiu de evaluare a tuturor febrelor din Africa Subsahariană a remarcat *P*. malarie *falciparum* în 1.527 din cele 2.633 de cazuri din Africa de Vest. Alte infecții comune au inclus febra tifoidă, febra paratifoidă, leptospiroza și febra recidivantă. Un sondaj european pe 6.957 de călători a raportat trei decese, printre care unul din cauza malariei severe din Liberia. Mai mult, un total de 1.832 au călătorit în Africa Subsahariană, 319 (17%) având diaree acută și 85 (5%) având diaree cronică. Diaree acută agenți patogeni incluse 38% unspeci- fied, 34% *Shigella* spp., 15% *Giardia lamblia*, 6% *Salmonella* spp., 5% *Campylobacter* spp., și 2% *histolytica Entamoeba*. Din cele 602 persoane cu boli febrile, au fost 241 de cazuri de *P. falciparum*, alte 82 de specii de malarie, 36 rickettsiae,

9 dengue, 8 chikungunya și 6 cazuri de salmoneloză. Alte complicații frecvente legate de bolile infecțioase au inclus 79 de persoane cu schistosomiasis, 63 cu infecții bac- teriale, 37 cu mușcături de artropode, 28 cu larve migrans, 12 cu miază, 10 cu ITS și 7 cu profilaxie postexpunere antirabică (PEP).

Liberia began as a colony of freed slaves from the United States in the early 1820s, naming the capital Monrovia after President James Monroe. By 1847, Liberia declared independence from the United States and was established as a republic. In 1980, an authoritarian rule was installed and lasted almost a decade until a rebellion started in 1989. The civil war lasted until 1997, but resumed in 2000 until a peace agreement was signed in 2003. Besides impact on the economy, government and society, the civil war also caused a collapse of Liberia's health infrastructure, which has yet to fully recover and is likely due to corruption and a lack of adequate financial support or leaderships.

Currently, Liberia has a population of 4.2 million, with a gross national income per person of approximately $580, a life expectancy of 62 years, and a literacy rate of 60%.

There are about 2.6 doctors and 12 midwives per 10,000 people, which is inadequate for proper medical care, especially during extreme epidemics such as Ebola. In general, the climate is tropical, hot all year round and humid. Specifically, winters are dry, with hot days and cool nights; summers are wet and cloudy with frequent heavy downpours (heavy rains from May to October, with a short break in mid-July to August). From November to March, the dry, dust-laden wind blows inland. The terrain is mostly flat to coastal plains rising to rolling plateaus with small mountains in the northeast (maximum elevation 1,380 m), with 579 km of Atlantic coastal waters. Liberia borders Guinea, Cote d'Ivoire and Sierra Leone. Vectors are common in the region and include ticks and various genera of mosquitoes, including Culex, Aedes and Anopheles.

Most operations carried out have blanket orders against sexual activity, to include no sexual activity with prostitutes. With respect to Liberian operations, there is a policy prohibiting sexual contact with service members deployed in support of the OAU.

Adolescents and young adults between the ages of 10 and 24 in sub-Saharan Africa bear a large burden of the global HIV/STI crisis. Factors contributing to this demographic include, for example, engaging in unprotected sex; having multiple sexual partners; lack of skills to use condoms correctly and consistently, including inadequate knowledge

about condom use and ability unavailability of condoms; and perceived invulnerability. [22] The global prevalence of STIs (other than HIV-1) is largely unknown in West Africa, and limited data are available for some countries in the region. In Burkina Faso, the prevalence of serosyphilis was reported to be 1.5% among first-time blood donors. A surveillance study of symptomatic STI patients in Ghana reported the detection of gonorrhea and chlamydia in 18% and 9% of cases, respectively. Among the small number of patients with gonorrhea culture and susceptibility results in this study (n = 7), all isolates were resistant to ciprofloxacin, penicillin, and tetracycline and susceptible to ceftriaxone and cefixime. These findings are consistent with the high rates of fluoroquinolone resistance in gonorrhea in the United States and worldwide. US treatment recommendations for STIs, including syphilis, gonorrhea, and chlamydia, are also applicable to West African populations.

As part of the management of the Ebola epidemic, patients receive whole blood transfusions. Although the prevalence of hepatitis B and C (HBV, HCV) in Liberia is largely unknown, a small study of blood donors in Monrovia, Liberia, in the mid-1990s showed an HBV surface antigen carrier rate of 12.4%, similar to the contemporary estimate of >8% for West Africa. The greatest global burden of HCV is in sub-Saharan Africa, with a prevalence of 5.3%. These and other infections are potential blood-borne pathogens that can be transfused through the transfusion of blood products. For example, data from US service members who received emergency transfusion products in Iraq and Afghanistan from military donors showed only one case of transfusion-transmitted HCV infection and one case of human T-lymphotropic virus type I.

The United Nations estimates the prevalence of HIV-1 in adults in Liberia to be 1.1% (0.9–1.3%), which is approximately double the prevalence in the US population (0.6%). In addition, HIV-2 is also present throughout West Africa, with the highest prevalence reported in Guinea-Bissau, where 8% of adults and 20% of people over the age of 40 were deterred from being infected. However, the prevalence of HIV-2 in Liberia is unknown. Although the clinical manifestations of individuals with HIV-2 infection are the same as those with HIV-1 infection (ie, compromised immune function and subsequent opportunistic infections and cancers), HIV-2 is associated with lower viral load levels and higher rates of slow CD4 decline and clinical progression compared to HIV-1. Diagnostic tests can detect both HIV-1 and HIV-2; however, additional testing may be needed to distinguish between these viruses. Treatment of HIV-2 differs from HIV-1 in that nonnucleoside reverse transcriptase inhibitors are not active against HIV-2.

Risk reduction education, including abstinence and correct condom use, was provided for those who choose to have sex. In addition, general order number one states that no sexual activity shall take place, involving local staff or commercial sex workers. PEP after percutaneous or sexual contact will be addressed with the medications listed above. In addition, all staff have previously received hepatitis B vaccine, which is 90% effective.

References

1. Gunn RA, Murray PJ, Ackers ML, Hardison WG, Margolis HS. Screening for chronic hepatitis B and C virus infections in an urban sexually transmitted disease clinic: rationale for service integration. Sex Transm Dis. 2001; 28(3):166-170.
2. https://bmcresnotes.biomedcentral.com/articles/10.1186/s13104-015-1719-2
3. Lai CL, Ratziu V, Yuen MF, Poynard T. Viral hepatitis B. Lancet. 2003; 362(9401):2089-2094.
4. Pachiadakis I, Pollara G, Lanțul BM, Naoumov NV. Is hepatitis C virus infection of dendritic cells a mechanism that facilitates viral persistence? Lancet infect Dis. 2005; 5(5):296-304.
5. Tran TT, Hepatitis B. Virus during pregnancy. Clin Liver Dis. 2013; 1(2):29-33.
6. https://www.thelancet.com/journals/langlo/article/PIIS2214-109X(14)70365-1/fulltext
7. Alavian SM. Military personnel should be vaccinated against hepatitis B infection. J Arch Mil Med. 2013; 2(1):e16450.
8. Human hypoxia-inducible deoxyribonuclease I is a cellular restriction factor of hepatitis B virus, Microbiologia naturii, 1er avril 2019 Camille Hallez1,2, Xiongxiong Li1,2,5, Rodolphe Suspène1, Valérie Thiers1, Mohamed S Bouzidi1,2, Cristina M Dorobantu3, Vincent Lucansky3, Simon Wain-Hobson1, Raphaël Gaudin3,4 and Jean-Pierre Vartanian1)
9. https://www.who.int/news-room/fact-sheets/detail/malaria
10. Mohammed K, Abdullah M, Omar J. Intestinal parasitic infections and assessment of risk factors in the North West. Nigeria: A Community Based Study IJPMBS. 2015;4(2):141–145
11. https://bmcinfectdis.biomedcentral.com/articles/10.1186/s12879-017-2466-x
12. Seroprevalence and risk factors for HIV, HCV, HBV and syphilis among blood donors in Mali. Aude Jary 1, Sidi Dienta 2, Valentin Leducq 3, Quentin Le Hingrat 4, Mahamadou Cisse 2, Amadou B Diarra 5, Djeneba B Fofana 6, Alhassane Ba 5, Mounirou Baby 5, Chad J Achenbach 7, Robert Murphy 7, Vincent Calvez 3, Anne-Geneviève Marcelin 8, Almoustapha I Maiga 2)
13. https://en.wikipedia.org/wiki/Malaria
14. I have. J. Trop. Med. Hyg., 93(5), 2015, pp. 912–917 doi:10.4269/ajtmh.15-0200 Copyright © 2015 by The American Society of Tropical Medicine and Hygiene Review Article: Gastrointestinal Infections in Deployed Forces in the Middle East Theater: An Historical 60 Year Perspective)
15. Evolution of the incidence of malaria in five health districts, in the context of the extension to seasonal malaria chemoprevention, 2016 - 2018
16. https://www.ceeol.com/search/article-detail?id=426897
17. https://sciendo.com/article/10.2478/arsm-2020-0033
18. https://bmcinfectdis.biomedcentral.com/articles/10.1186/1471-2334-8-119
19. https://pubmed.ncbi.nlm.nih.gov/27708189
20. Heppner DG Jr., Magill AJ, Gasser RA Jr., Oster CN: The threat of infectious diseases in Somalia. N Engl J Med 1993; 328(14): 1061-1068.
21. Laughlin LW, Legters LJ: Disease threats in Somalia. Am J Trop Med Hyg 1993; 48(2): vi–x.
22. Oldfield EC, 3rd, Rodier GR, Gray GC: The endemic infectious diseases of Somalia. Clin Infect Dis 1993; 16(Suppl 3): S132-57.
23. Smallman-Raynor MR, Cliff AD: Impact of infectious diseases on war. Infect Dis Clin North Am 2004; 18(2): 341-368.
24. Arnold K, Cutting RT: Causes of death in United States military personnel hospitalized in Vietnam. Mil Med 1978; 143(3): 161-164.
25. https://books.google.com/books?hl=en&lr=&id=L8crAAAAYAAJ&oi=fnd&pg=PP17&dq=Neel+S:+Vietnam+Studies:+Medical+support+of+the+U.S.+Army+in+Vietnam+19651970.+Washington,+DC,+Department+of+the+Army,+1991.+Available+at+http://www.history.army.mil/books/Vietnam/MedSpt/MedSpt-FM.htm%3B+accessed+November+19,+2014.&ots=ArIGooBNZO&sig=0qd2mzc8Xvba4R5cNgRxVFt5si0
26. Porter WD: Imported malaria and conflict: 50 years of experience in the U.S. military. Mil Med 2006; 171(10): 925-928.
27. Gibbons RV, Streitz M, Babina T, Fried JR: Dengue and US military operations from the Spanish-American War through today. Emerg Infect Dis 2012; 18(4): 623-630.
28. Armed Forces Health Surveillance Center: Medical evacuations from Afghanistan during Operation Enduring Freedom, active and reserve components, U.S. Armed Forces, 7 October 2001-31 December 2012. MSMR 2013; 20(6): 2-8.