

INCIDENCE OF INFECTIOUS DISEASES IN THE MILITARY WENT TO THE MALI OPERATIONS THEATER

Stoica (Vaduva) Izabela Oana¹, Dumitru Magdalena Irina²

¹ Constanta Military Emergency Hospital

² Constanta Infectious Diseases Clinical Hospital

Izabela Oana Stoica

email: izabela_vaduva@yahoo.com

phone: +40 724762824

ABSTRACT

Soldiers on missions are at risk of contracting major infectious diseases. Some of the most common food or water-borne diseases include diarrhea (bacterial and protozoan), hepatitis A, and typhoid fever, all of which pose serious threats to communities.

The studied group consists of 13 people who performed missions in the theater of operations in Mali between December 2020 and June 2021. The analyzes were performed in the medical analysis laboratory of the Military Emergency Hospital. The group consists of males with an average age of 35-45 years, most with hypercholesterolemia

Analyzes were performed in the fields of microbiology, virology and biochemistry. before and after the mission, they left with antimalarial treatment. Pharyngeal, nasal and digestive tract microbiota showed no noticeable changes. Only in 2 cases of coproparasitological examination were positive on return for Blastocyst hominis (which is not an endemic parasite, being found in drinking water from unsafe sources)

Following the analyzes performed, we came to the conclusion that the protection measures taken in the theaters of operations are effective, as there is no contamination on the studied group with endemic germs of the area.

Keywords: Mali, missions, infectious diseases.

Introduction

Mali is one of the countries at risk for contracting major infectious diseases: HIV, HBV, HCV, malaria, diarrheal diseases or diseases transmitted by arthropods. The prevalence of these infections is changing and the identification of risk factors associated with each infection in Mali is needed to improve health care.

A cross-sectional study of all blood donors (n = 8207) in 2018 at the blood bank at the University Hospital of Bamako, 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 males;

* HCV prevalence was 2.32%, higher in the population living outside Bamako;

* the seroprevalence of syphilis was very low (0.04%), with only 3 people infected. (1)

Of all the diseases, malaria is the leading cause of death in Mali, especially for children under 5 years of age. Malaria is caused by single-celled microorganisms in the Plasmodium group. The disease has the vectors of the infected Anopheles mosquito, being spread in 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. (2) The prevalence of malaria among children under five years of age has been of 36% since 2015. *Plasmodium falciparum* is the main cause of infection.

Some of the most common food or water-borne diseases include diarrhea (bacterial and protozoan), hepatitis A and typhoid fever, all of which pose serious threats to communities and theaters of operations in endemic regions. Despite improved sanitation, food safety and other public health interventions, there has been a minimal reduction in the incidence of these diseases: for example, between March 2003 and June 2006, there were approximately 146 cases per 1,000 people. Although there has been a decrease in the incidence, there is no doubt that diarrhea, dysentery and gastroenteritis have been and are still a common occurrence in Central Africa (3)

Material and method

The soldiers who went on a mission are exposed to the risk of contracting infectious diseases endemic to the area where the theater of operation is located. We conducted a study on a group of 13 military personnel who performed a mission in an operating theater in Mali between December 2020 and June 2021. The analyzes were performed within the Medical Analysis Laboratory from the card of the Constanța Military Emergency Hospital .

The paraclinical diagnosis scheme of possible infections is made up of analyzes in the field:

- biochemistry, hematology - evaluating the general status of the patient;
- virology - Ag Hbc, Ac HCV, AgHAV, Ac HAV, Ag Hbc, Ac Hbc, HIV, RPR, TPHA;
- microbiology - uroculture, coproculture, pharyngeal exudate, nasal secretion, coproculture, coproparasitological examination;
- calprotectin;

- the thick drop.

Within the laboratory, the analyzers used are represented by: integrated biochemistry-immunology analyzer Architect CI4100, immunology analyzer Minividas, Biomerieux culture media and bacterial identification analyzer and Vitek antibiogram.

Virology tests for hepatitis and HIV performed on the Minividas analyzer are performed by ELFA (enzyme linked fluorescent assay) method this is an enzymatic immunoassay involving the use of a flouochrome instead of chromogenic substrate thus having a high sensitivity for the detection of developing antibodies of ELISA method.

The culture media (poorly differentiated, differentiated and chromogenic) used for seeding biological products in the field of bacteriology are represented by: blood agar, CLED, Champman, Sabouraud, Uriselect, Hectoen, SS medium.

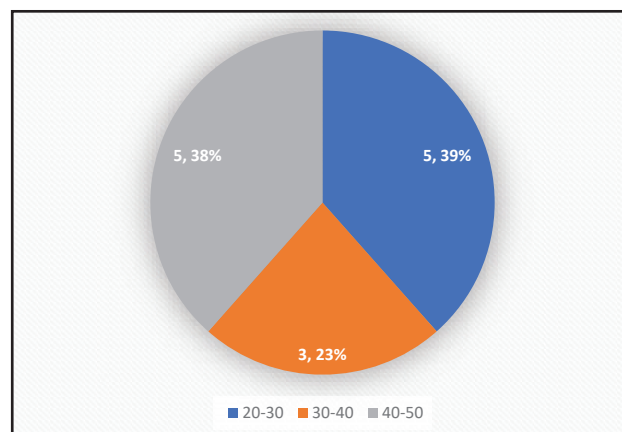


Figure 1 – Distribution by age groups

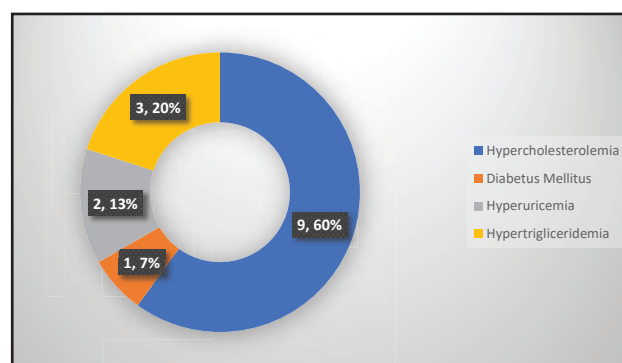


Figure 2 - Biochemical changes

The ages of the soldiers who went on a mission can be classified in the groups of 20-30 and 40-50 years. All subjects studied are male. Biochemical analyzes showed that the

majority (9.60%) have hypercholesterolemia. Other biochemical changes encountered are: hypertriglyceridemia, hyperuricemia and diabetes.

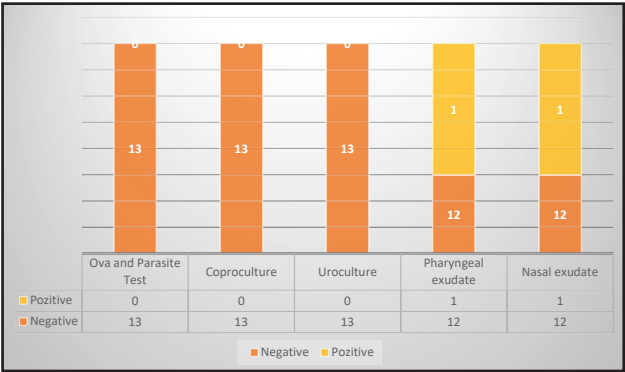


Figure 3 - Bacteriology departure

At the time of the mission, the number of positive bacteriological samples was two, a pharyngeal exudate (where *Klebsiella pneumoniae* was found) and a nasal exudate (in which we found a *Staphylococcus aureus*) and all coproparasitological samples were negative. On return, 3 bacteriology samples were positive: one pharyngeal exudate (in which *Streptococcus pneumoniae* was highlighted) and two nasal exudates (in which *Staphylococcus aureus* was highlighted), and the coproparasitological examination showed *Blastocystis hominis* in 2 samples

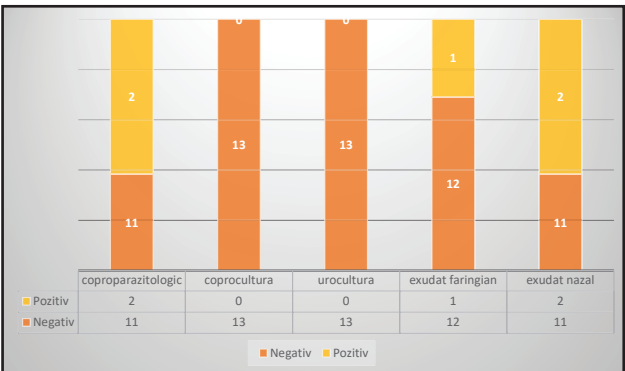


Figure 4 - Bacteriology return

The results of laboratory tests in the field of virology did not show changes between the values from departure and those from return from missions, all participants having negative tests. Only the levels of antibodies for hepatitis A and B on return with an increased titer compared to departure, because they are vaccinated before

departure. against hepatitis A and B virus. The thick drop was negative in all 13 cases, they left with antimalarial medication. Calprotectin is normal in all 13 cases

Discussions

Due to its geographical location and climatic conditions in Mali, malaria is considered the most common human parasitic disease. In Mali in 2018 there were 2,345,481 cases of malaria according to the (National Health Information System) (4). And in Romania the incidence of this disease it is very small, in our country there are no favorable conditions for the development of this infection, all cases being imported. (5)

In Mali the incidence of Bsi C hepatitis is high, a study conducted in 2018 showed the prevalence of HBsAg = 14.78% and HCV = 2.32. (1). While in Romania the evolution of the incidence of viral hepatitis B and C in Romania in the period 2006-2020 is decreasing from one year to another, in 2020 they entered the national surveillance system for viral hepatitis B and C a number of 48 cases 5 times less than the previous year. (6)

Conclusions

Preventive methods were effective - vaccines protected them (increased antibody titer on arrival from mission versus departure, for hepatitis A and B), they leave with antimalarial medication (thick drop being negative).

The military microbiota does not change - which highlights healthy conditions in theaters of operation.

Blastocystis hominis is a parasite that is found in non-potable water - infected soldiers may have consumed bottled water.

The microclimate in the operating theater respects the hygienic-sanitary measures, so that the health of the military is not endangered.

References

1. Jary A, Dienta S, Leducq V, Le Hingrat Q, Cisse M, Diarra AB, et al. Seroprevalence and risk factors for HIV, HCV, HBV and syphilis among blood donors in Mali. BMC

- Infect Dis. 2019 Dec;19(1):1064.
2. Wikipedia contributors. Malaria Wikipedia [cited 2020]. Available from: <https://en.wikipedia.org/w/index.php?title=Malaria&oldid=1064644565>.
 3. Riddle MS, Savarino SJ, Sanders JW. Gastrointestinal Infections in Deployed Forces in the Middle East Theater: An Historical 60 Year Perspective. *Am J Trop Med Hyg*. 2015 Nov;93(5):912–7.
 4. Sacko A, Sagara I, Berthé I, Diarra M, Cissoko M, Diarra SS, et al. Evolution of Malaria Incidence in Five Health Districts, in the Context of the Scaling Up of Seasonal Malaria Chemoprevention, 2016 to 2018, in Mali. *Int J Environ Res Public Health*. 2021 Jan;18(2).
 5. Institutul National de Sanatate Publica Romania. Supravegherea malariei in romania INSP: INSP; 2020 [updated 2016; cited 2020.] Available from: <http://cnsrbt.ro/index.php/metodologii/malarie/576-supravegherea-malariei-in-romania>.
 6. Institutul National de Sanatate Publica Romania. Hepatita virala B si C, anul 2020 analiza INSP: INSP; 2020 Available from: <https://www.cnsrbt.ro/index.php/analiza-date-supraveghere/hepatita-virala-tip-b-si-c/2303-hepatita-virala-b-si-c-anul-2020-analiza>.