(RESEARCH ARTICLE)

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Co-infection malaria and HIV/AIDS: Epidemiological and clinical aspects at the Communal Medical Center (CMC) Miniere, Guinea

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Abstract

Objectives: to calculate the frequency of malaria and HIV co-infections, to describe the socio-demographic characteristics, to describe the clinical signs and to plan treatment.

Methodology: This was a retrospective descriptive study lasting 09 months from August 01, 2019 to April 31, 2020, conducted at CMC Minière (2nd level reference structure in Guinea). We carried out an exhaustive inventory of cases according to the inclusion and non-inclusion criteria. After applying the selection procedure (inclusion and non-inclusion criteria), we obtained a sample of size N = 68 cases.

Results: we recorded 68 seropositive malaria patients out of a total of 1232, i.e. a frequency of 5.52%. The epidemiological profile was that of a person in the age group of 30-34 years (26.47%), Unemployed (47.06%), out of school (54.41%) and single (75%). The reasons for consultation are dominated by fever (69.11%) and physical asthenia (50%). Patients were from their homes (92.65%). The type of malaria was severe associated with HIV1 infection (55.88%). The majority of patients had an average parasite density (10,000-50000) or 54.41% and 22.06% had a CD4 count between 200-499 cells / mm3. The antimalarial and antiretroviral treatment consisted respectively of the administration of quinine 65% and AZT + 3TC + EFV or 54.41%.

 N.B: AZT = Zidovudine; 3TC = Lamivudine; EFV = Efavirenz; d4T = Stavudine

Conclusion: Malaria contributes to an increase in the viral load in adults with positive retroviral serology, due to the lymphopenia caused during febrile attacks. This finding suggests an emphasis on malaria in people infected with HIV.

Keywords: Co-Infection; Malaria; HIV / AIDS

1. Introduction

Malaria and HIV are two major public health problems nowadays, responsible for several million deaths each year, especially in sub-Saharan Africa. Much work has been published on the potential interactions between HIV infection and Malaria. Malaria attacks lead to a transient increase in plasma viral load, but there is no clear evidence that malaria accelerates the progression of HIV infection [1].

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Malaria may increase the risk of HIV transmission, including through injections with contaminated equipment or transfusion of contaminated blood product [2]. The impact of HIV infection on malaria infection is modulated by the degree of immunosuppression of patients, but also increases the incidence of malaria attacks, especially as the immunosuppression is deep, with an increase in the severity of malaria attacks and mortality [3].

In urban areas, it has been shown that the forms of malaria are no longer the preserve of infants, but also affect adults. However, HIV infection is rife in these settings in Africa and mainly affects adults. The role of low malaria transmission as well as the resulting lower anti-malaria premunition has been mentioned. However, the hypothesis of some role for HIV has not been ruled out, as studies seem to point to an aggravation of malaria in the event of co-infection with HIV, particularly among adults, even though most of the available literature contrasts with these results. However, work has shown an interaction between malaria and HIV with regard to the immune response and the roles of cytokines has been clearly demonstrated in the two aggravating factors of malaria or of the proliferation of HIV exist in case of co-infection even if their mechanisms remain poorly understood. Few of the studies on the issue have focused specifically on the association of malaria and HIV infection, particularly in adults [4].

Studies have already shown that infection with Plasmodium falciparum stimulates HIV viral replication through increased production by activated lymphocytes of cytokines (IL-6 and TNF –α). Also, it is known that serum HIV-1 viral concentrations are higher in patients with malaria and remain elevated for up to 4 weeks after initiation of antimalarial treatment. It is also accepted that the human immunodeficiency virus (HIV) selectively infects CD4 helper lymphocytes and that the latter are potentially responsible for the induction or orchestration of the entire immune response to the various attacks of the cell. organism [5].

The objectives of this study were to: calculate the frequency of malaria and HIV co-infections, describe the socio-demographic characteristics, describe the clinical signs and plan treatment.

2. Methodology

This was a descriptive retrospective study lasting 09 months from August 01, 2019 to April 31, 2020, conducted at CMC Minière (2nd level reference Medical Center in Guinea).

All people who consulted and / or hospitalized for malaria with whom the retroviral serology came back positive and whose age is greater than or equal to 15 years were included in the study.

All the people who were consulted and / or hospitalized for malaria in whom the retroviral serology came back negative were not included in the study.

We carried out an exhaustive inventory of cases according to the criteria defined above.

After applying the selection procedure (inclusion and non-inclusion criteria), we obtained ad sample of size N = 68 cases.

The variables studied were**:**

- Epidemiological: frequency, age, sex, profession, level of education, marital status.
- Clinics: Reasons for consultation, method of admission, types of malaria associated with types of HIV.
- Paraclinical: parasite density, TCD4 lymphocyte count.
- Therapeutics: anti-malaria drugs, antiretroviral drugs.

3. Results

3.1. Epidemiological variables

- **Frequency**: During the study period, we recorded 68 seropositive malaria patients out of a total of 1232, ie a frequency of 5.52%.
- **Age**: The 30-34 age group was the most affected in our series with 26.47%. The average age of the patients was 26 years with extremes of 15 and 42 years.

- **Profession**: The unemployed were the most represented with 47.06% and the least represented were employees with 10.29%.
- **Level of education**: The out-of-school patients were the most numerous 54.41% followed by those with a secondary level of education 54.41%.
- **Marital status**: The study of this parameter reveals that 75% of patients were single against 7.35% of married women.

3.2. Clinical variables

- **Reasons for consultation**: Fever and physical asthenia were the most frequent reasons for consultation in our series with respectively 69.11% and 50%.
- **Mode of admission**: In our study, 92.65% of patients came from their homes against 5.88% of referrals and 1.47% of evacuees.
- **Types of malaria associated with types of HIV**: We recorded 55.88% cases of severe malaria associated with HIV-1 infection, 30.88% cases of uncomplicated malaria associated with HIV-1 infection; 2.94% severe malaria associated with HIV-1 infection; 4.41% uncomplicated malaria associated with HIV-2 infection,; 4.41% cases of uncomplicated malaria associated with HIV-1 / HIV-2 infection and 1.47% cases of severe malaria associated with HIV-1 / HIV-2 infection.

3.3. Paraclinical variables

- **Parasite density**: The majority of patients had an average parasite density (10,000-5,000), ie 54.41%.
- **TCD4 lymphocyte count:** During our study, 27 of our HIV positive malaria patients achieved a TCD4 lymphocyte count; among them: 22.06% had a CD4 count between 200-499 cells / mm3; on the other hand 38 of our HIV positive malaria patients did not have a lymphocyte count, ie 55.88%.

Table 1 TCD4 lymphocyte count

T-CD4 lymphocytes	Number	%
Absence	38	55,88
<200 Cell/mm^3	8	11, 76
200-499 Cell / mm^3	15	22, 06
≥ 500 Cell / mm^3	4	5, 88
Total	68	100

3.4. Therapeutic variables

- **Anti-malaria drugs:** during our study, 65% of our co-infected malaria patients received injectable quinine.
- **Antiretroviral drugs:** the analysis of this parameter shows that 11.76% of our HIV positive malaria patients did not benefit from antiretroviral treatment, on the other hand 88.24% did; among them: 54.41% were subjected to AZT + 3TC + EFV; 19.12% were subjected to d4T + 3TC + EFV and only 14.71% were subjected to d4T + 3TC + NVP.

Table 2 Anti-malaria drugs

Drug	Number of cases	%
injectable quinine 39	57,80	
Artemisinin derivatives	10	14,20
Sulfadoxine / Pyrimethamine	19	28
Total	68	100

Table 3 Antiretroviral drugs

Antiretrovirals	Number	%
Without ARV	8	11,76
AZT+3TC+NVP	37	54,41
d4T+ 3TC+EFV	13	19,12
d4T+3TC+NVP	10	14,71
Total	68	100,00

N.B : AZT = Zidovudine ; 3TC= Lamivudine ; EFV = Efavirenz ; d4T= Stavudine

4. Discussion

4.1. Epidemiological variables

- **Frequency**: During the study period, we recorded 68 seropositive malaria patients out of a total of 1232, i.e. a frequency of 5.52%. This result is close to the frequencies reported respectively by THIAM .M and COLL [6] in Dakar 3.9% and by COURBIERE.B. and COLL [7] in France 2%. On the other hand, it is clearly lower than that found by BALDE ISMAILA. [8] at the Donka national hospital, Conakry University Teaching hospital, which was 12.9%. This frequency in our series could be explained by the fact that the communal medical center of La Minière is one of the health centers on the outskirts of the city of Conakry where consultation is poor.
- **Age**: The 30-34 age group was the most affected in our series with 26.47%. The average age of the patients was 26 years with extremes of 15 and 42 years. This result is similar to that found by DE SOUZA J. and COLL [9] in Cotonou who note a maximum peak of Malaria / HIV in the age group of 30-34 years with a frequency of 32.1% and an age average age 22. MAYI-TSONGA S. and COLL [10] in Libreville found that the age group ≤ 19 years was the most represented with 41% against 12% for the 30-34 age group. The high frequency in this age group in our series could be explained by the fact that these age groups constitute the most active segment of the population.
- **Ocupation**: The Unemployed were the most represented with 47.06% and the least represented were employees with 10.29%. This result is consistent with those reported respectively by BALDE ISMAILA. [8] at the Donka National Hospital of Conakry University Teaching Hospital, ie 48.3% housewives and 6.6% employees and ROSOLONJATOVO JDC and COLL. [11] at the regional hospital of Antsirabe Antananarivo, ie 59.18% unemployed.
- **Level of education**: The out-of-school patients were the most numerous 54.41% followed by those with a secondary level of education 54.41%. This result is similar to those found by NOUTANEWO E. [12] in the study of the UN / AIDS or 62% of out of school against 38% of schooling and ABU-RADDAD U. and COLL [13] which reports 57.6% of out of school and 28% of primary education. This predominance of out-of-school people could be explained by the fact that they are more numerous in the general population and have less information on health and on the said diseases.
- **Marital status**: The study of this parameter reveals that 75% of patients were single against 7.35% of married women. This result is similar to those reported by BALDE IS MAILA. [8] at the Donka National Hospital of Conakry University Teaching Hospital and ABU-RADDAD U. and COLL. [13] ie 66.8% and 65.6% respectively of single women. It could be explained by the fact that in our society there is more libertine situation among single people.

4.2. Clinical variables

4.2.1. Reasons for consultation

Fever and physical asthenia were the most frequent reasons for consultation in our series with respectively 69.11% and 50%. Our result is similar to those found by NOUTANEWO E. [12] in the UN / SIDA study and ABU-RADDAD U. and COLL [13], respectively 76.3% fever and 73.72% physical asthenia and 60.4% physical asthenia and 53, 18% Fever.

4.2.2. Mode of admission

In our study, 92.65% of patients came from their homes against 5.88% of referrals and 1.47% of evacuees. This result is contrary to those found by BALDE ISMAILA. [8] at the Donka National Hospital of Conakry University Teaching Hospital and ABU-RADDAD U and COLL. [13] respectively 63.55% of his patients came from their home, 15.57% were

referred, 22.88% evacuees, and 34.8% presented spontaneously in the health facility against 56.8 % referrals and 8.4% evacuees.

4.2.3. Types of malaria associated with types of HIV

We recorded 55.88% cases of severe malaria associated with HIV-1 infection, 30.88% cases of uncomplicated malaria associated with HIV-1 infection; 2.94% severe malaria associated with HIV-1 infection; 4.41% uncomplicated malaria associated with HIV-2 infection,; 4.41% cases of uncomplicated malaria associated with HIV-1 / HIV-2 infection and 1.47% cases of severe malaria associated with HIV-1 / HIV-2 infection.

4.3. Paraclinical variables

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4.4. Therapeutic variables

- **Anti-malaria drugs**: During our study, 65% of our co-infected malaria patients received injectable quinine. This high percentage could be explained by the fact that quinine is the treatment of chosen in cases of severe malaria or malaria attacks accompanied by vomiting and / or nausea.
- **Antiretroviral drugs**: The analysis of this parameter shows that 11.76% of our HIV positive malaria patients have not benefited from antiretroviral treatment, on the other hand 88.24% have benefited. among them: 54.41% were subjected to AZT + 3TC + EFV; 19.12% were subjected to d4T + 3TC + EFV and only 14.71% were subjected to d4T + 3TC + NVP.

N.B: AZT = Zidovudine; 3TC = Lamivudine; EFV = Efavirenz; d4T = Stavudine

5. Conclusion

Malaria contributes to an increase in the viral load in adults with positive retroviral serology, due to the lymphopenia caused during febrile attacks. This finding suggests to focus on malaria in HIV-infected subjects and also to think of the co-infection malaria and HIV infection in front of all patients complaining of repeated malaria attacks despite correct management and vice versa.

Compliance with ethical standards

Statement of informed consent

Informed consent was obtained from all individual participants included in the study.

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