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The impacts of co-infection of HIV and *Falciparum* malaria on cellular immune responses of pregnant mothers and their babies' post-delivery

Abstract

It has been postulated that co-infection of HIV and malaria complicate diagnosis and treatment of either infection or both. Other studies indicated that clinical malaria led to HIV RNA level rise, and decline as much as 40 cells/μL/year with each episode of malaria. This study assessed the impacts of on the number of $CD4^+$ cells and levels of cytokines produced in pregnant women and their babies post-delivery. Saki; (Latitudes 8° 26' and 9° 5' North and Longitudes 2° 45' and 3° 37' East) known for its sero-prevalence and co-infection in Oyo State, Nigeria. 149 pregnant mothers screened of HIV and P. Falciparum after due informed consent and ethical approval. Thirty babies born to sero-positive mothers were enrolled and followed-up post-partum. Blood samples (5mL) collected were screened for the presence of malaria parasites. Data obtained were analyzed using Student t-test and ANOVA. Co-infection impacted on the weight of babies and making them susceptible to be anemic. The co-infected had higher parasitemia compared to their mono and uninfected counterparts. Co-infected mothers had lower CD4+ lymphocytes. The high level in TNF-α could favour viral replication, vertical transmission of HIV and indicative of compromised cellular immunity. IL-2 suggested possible placental malaria. In consonance with earlier studies; IL-10 played Immuno-mediatory role. IFN-γ levels suggest increased chances of poor birth outcomes. The co-infection rate impacted on the percentage of $CD4^+$ lymphocytes and modulated the plasma levels of cytokines.

Keywords: sero prevalence, episode of malaria, cytokines, impacted

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Abbreviations: CD4, clonal differentiation; HIV-human immunodeficiency virus; RNA, ribonucleic acid; IL, interleukin; IFN, interferon; ANOVA, analysis of variance

Introduction

It has been postulated that co-infection of HIV and malaria complicate diagnosis and treatment of either infection; thereby threatens the protective cellular barrier mounted to establish pregnancy as well as maintain the well-being of the foetus. Other studies indicated that clinical malaria led to HIV RNA level rise, and decline as much as 40 cells/μL/year with each episode of malaria. This study examined the impacts of *P. Falciparum* and HIV co-infection on the number of $CD4^+$ cells and levels of cytokines produced in pregnant women and their babies post-delivery.[1–2]

Methods

Saki; (Latitudes 8° 26' and 9° 5' North and Longitudes 2° 45' and 3° 37' East) known for its seroprevalence and co-infection in Oyo State, Nigeria. 149 pregnant mothers screened of HIV and *P. Falciparum* after due informed consent and ethical approval by UI/UCH Ethical Committee and 30 babies born to sero-positive mothers were enrolled and followed-up *Post-partum*. Blood samples (5mL) collected were screened for the presence of malaria parasites. Patients' $CD4^+$ counts and plasma concentration of (TNF-α, IL-2, IL-10 and IFN-γ) were determined by FACS and ELISA techniques respectively Data obtained were analyzed using Student t-test and ANOVA.

Results

Co-infection impacted on the weight of babies and likely anemic (Figure 1). The co-infected (Table 1) had higher parasitemia compared to their mono and uninfected counterparts (Figure 2A) (Figure 2B). Co-infected mothers had lower CD4+ lymphocytes (Figure 3). The high level in TNF-α could favour viral replication, vertical transmission of HIV and indicative of compromised cellular immunity (Figure 4). IL-2 suggested possible placental malaria (5B). In consonance with earlier studies; IL-10 played Immuno-mediatory role IFN-γ levels suggest increased chances of poor birth outcomes (Figure 5).

Table 1 Participants by infection status

Infection	Co-infected	HIV only	Malaria only	No-infection	Total
Mothers	34 (22.8)	11(36.7)	51(49.0)	53(51.0)	149(100.0)
Infants	5(26.3)	14(73.7)	6(54.5)	5(45.5)	30(100.0)
Total	39(21.8)	25(13.9)	57(31.8)	58(32.5)	179(100.0)

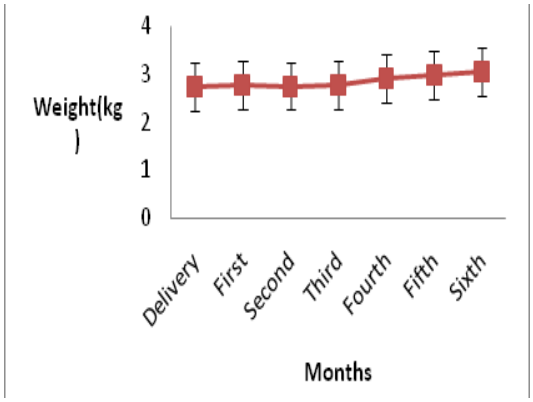

Figure 1 The mean weight of co-infected babies at delivery and early post-delivery.

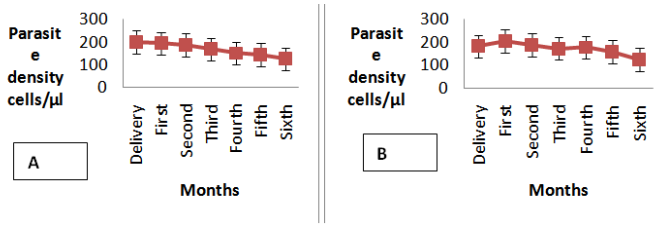

Figure 2 A, The mean parasite density in babies post-delivery; B, The mean parasite density in co-infected babies.

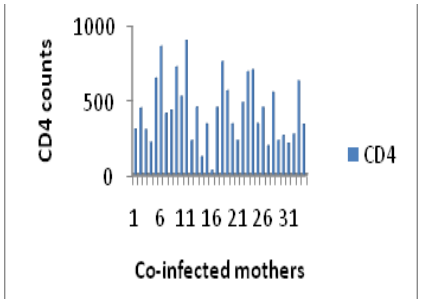

Figure 3 CD4 count inco-infected mothers.

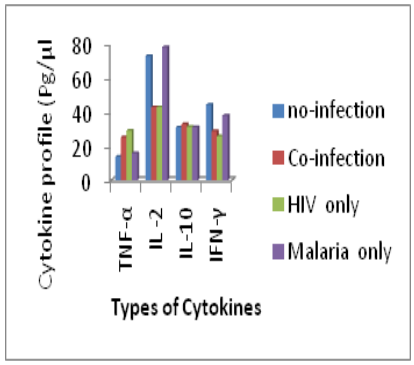

Figure 4 Cytokines in co-infected mothers.

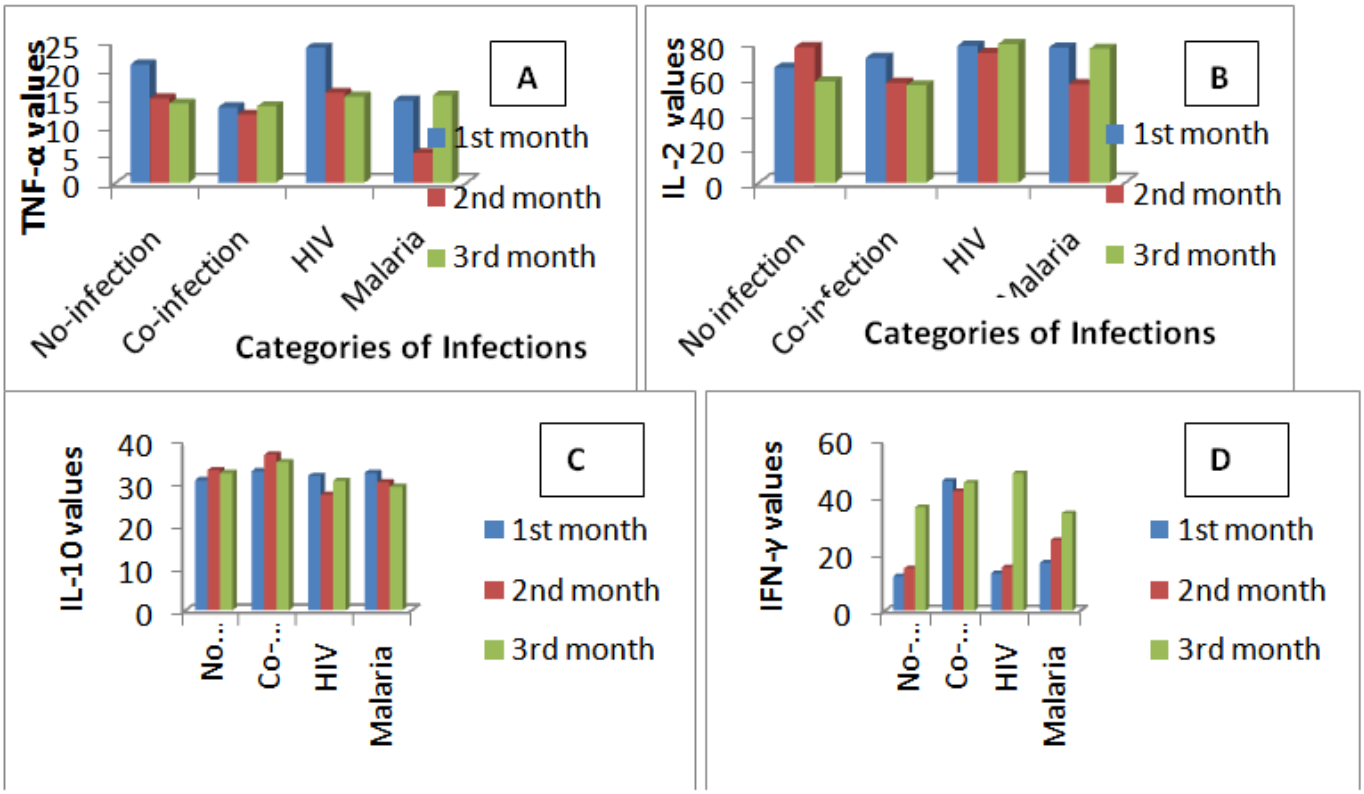

Figure 5 Cytokine levels in co-infected babies.

Conclusion

The co-infection rate impacted on the percentage of $CD4^+$ lymphocytes and modulated the plasma levels of cytokines.

Acknowledgements

We acknowledge the contributions of colleagues, the participants and the authorities of the selected hospitals.

Conflict of interest

The Author declared that there is no conflict of interest.

References

1. Corbett EL, Steketee RW, TerKuile, et al. HIV-1/AIDS and the control of other infectious diseases in Africa. *Lancet.* 2002;359(9324):2177–2187.
2. World Health Organization. Malaria and HIV interactions and their implications for public health policy. *World Health Organization*. Geneva, Switzerland; 2011.

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