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Mini Review

The Influence of *Toxoplasma gondii* in Malaria Immunity

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Abstract

Both malaria and toxoplasmosis are protozoan parasitic diseases. They affect huge population around the globe. Among those pregnant women, they are the group that may have severe complications for mother and foetus. In this review we discussed the role of *Toxoplasma gondii* to protect malaria patients from the severe complications of malaria. We observed that *Toxoplasma gondii* provides protection against malaria consequences just for immune-competent patients. Experimental research is required to enrich literature about the defensive role of *Toxoplasma gondii* against complications of infection with *Plasmodium* species.

Keywords: *Plasmodium falciparum; Toxoplasma gondii; Immunity; Immune-Competent; Immune- Compromised*

Introduction

Toxoplasma gondii and *Plasmodium* species are both endemic apicomplexan parasites that have been incriminated in the cause of febrile illnesses in children in the sub-Saharan regions of Africa. Moreover, these parasites have some common routes of transmission, common receptors for pathogenicity and both effect or of some hematological parameters [1]. They have severe consequences on the health particularly for the pregnant women and their unborn babies [2]. Malaria is a life-threatening parasitic disease, common in tropical regions of the world caused by *Plasmodium* species and chiefly transmitted by bites of infected females of anopheles mosquitoes. Asymptomatic toxoplasmosis is widespread in the malaria region and may serve as another factor which hides malaria symptoms or at least prevents its complications.

Discussion:

Study done by Lee DH., *et al*. [3] indicated that preceding experience of *P. berghei* (ANKA) provoke resistance to following *T. gondii* infection.

Study done by Ahmed N., *et al*. [4] showed that a preceding *T. gondii* infection limits a specific Th2 immune response while upholding a shift toward a Th1-type immune response. immune response towards *plasmodium falciparum* controlled by proinflammatory Th1 cytokines, and in particular IFN-γ may play a role in limiting progression from uncomplicated malaria to severe and life-threatening complications [5], so possibly through this way *Toxoplasma gondii* provides immunity against malignant malaria.

While hyperuricemia indicates malaria severity [6], allopurinol medicine used to treat gout showed anti-inflammatory effects among ocular toxoplasmosis patients, whom most of them are non immune-competent [7] and then get toxoplasmosis.

Conclusion

We conclude that *Toxoplasma gondii* offers protection against malaria complications for immune competent people and complicates the condition in immune compromised patients due to defect in cellular immunity.

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