188

SPECIFIC *PLASMODIUM* ELIMINATION DURING A SECOND INFECTION IN CBA/CA MICE

Martha Legorreta-Herrera, Adriana Ramos-Avila, Jannete R. Rodríguez-López, Marcela Ulloa-Martínez, Osvaldo D. Castelan-Martínez

FES Zaragoza, Universidad Nacional Autonoma de Mexico, Distrito Federal, Mexico

In malaria endemic areas individuals are susceptible to several infections before they develop a protective immunity, the basis of this susceptibility and the precise nature of the immune mechanisms that control the parasitaemia during the first and subsequent infections are still not well understood, however, they are relevant to understand the immunity to malaria. In this work we studied how a first infection with *Plasmodium yoelii* 17XL affect the dynamic of the parasitaemia during a second infection with the homologous parasite, or with *P. chabaudi* AS or with the mixture of *P. chabaudi* AS and *P. yoelii* 17XL in CBA/Ca mice using a nested PCR. A batch of CBA/Ca mice was infected with $5X10^4$ parasitized erythrocytes with *Plasmodium yoelii* 17XL. On day 7 post-infection, mice were treated with a therapeutic dose of pyrimethamine, 8 weeks later, mice were split into three groups, the first was re-infected with $5X10^4$ parasitized erythrocytes of the homologous parasite, the second group was re-infected with *P. chabaudi* AS and the third with the mixture of both parasites. Parasitaemia was measured in Giemsa stain blood films and by using a specific nested PCR. We also studied some of the pathology parameters as weight lost, splenic index and haemoglobin concentration in the re-infected mice. The results show that there was a specific parasite elimination since mice reinfected with the homologous *Plasmodium* developed lower parasitaemia levels than mice infected with the heterologus parasite. Interestingly mice reinfected with the mixture of both parasites cleared the parasitaemia almost at the same time than mice infected with the homologous *Plasmodium*. In spite of the ability to clear the parasitaemia developed by mice infected with the homologous parasite, this group of mice showed almost the same levels of haemoglobin concentration and weight lost that mice infected with the heterologous parasite. The results of splenic index showed an increment in all groups of mice, at the beginning of re-infection it was higher in mice re-infected with *P. yoelii* 17XL but at the end of re-infection the splenic index was higher in mice infected with *P. chabaudi* AS. In this work we showed that during a re-infection even when protection against the homologous parasite has been developed still remains strong spleen activation probably due to exposition to different or new *Plasmodium* antigens, which explains at least in part the need of several infections to get a solid immunity.

(ACMCIP Abstract)

189

ROLE OF COMPLEMENT AND COMPLEMENT REGULATORY PROTEINS IN SEVERE ANEMIA CAUSED BY *PLASMODIUM CHABAUDI*

Juliana V. Harris, Catherine N. Stracener, José A. Stoute

Uniformed Services University of the Health Sciences, Bethesda, MD, United States

Malaria accounts for about 1-2 million deaths per year, with the majority due to complicated *Plasmodium falciparum* malaria, such as severe malaria-associated anemia. Not much is understood about the pathogenesis of this anemia. C57BL/6 mice inoculated with 10^6 *P. chabaudi* AS-infected red blood cells experience a primary peak of high parasitemia and severe anemia at approximately 6-7 days post infection. After one week of recovery, a secondary peak with much lower parasitemia occurs with an additional hematocrit drop. We will present data on the role of complement (C3), red cell complement regulatory proteins and anti-malarial antibody levels in the development of anemia in this model by comparing the infection in wild-type animals and complement (C3) and complement regulatory protein knockouts.

190

FCγ RECEPTOR POLYMORPHISMS IN GHANAIAN CHILDREN WITH CLINICAL MALARIA

Anastasia R. Ocran

Noguchi Memorial Institute for Medical Research, Accra, Ghana

Multiplication of the blood-stage of the malaria parasite and host factors are responsible for the pathogenesis of malaria. Host factors include immune factors and genetic factors such as polymorphisms polymorphisms in Fcγ receptors. Acquired immunity to malaria is dependent on age and exposure. Cytophilic antibodies (IgG1 and IgG3) play a major role in effecting acquired immunity however, in some studies IgG2 have been found to be associated with protection against clinical malaria because of its high affinity for certain polymorphisms of FcγRIIA and FcγRIIIB. Fcγ receptors, which are found on myeloid cells such as mononuclear phagocytes and neutrophils, bind to the Fc portion of immunoglobulin (Ig), leading to phagocytosis and parasite killing thus mediating immune responses. The gene that codes for this receptor is polymorphic and is associated with predisposition to malaria infection. In this study we investigated the roles of the FcγRIIA and FcγRIIIB polymorphism in the pathogenesis of clinical malaria in Ghanaian children. The study population consisted of a cohort of 210 children aged, three to ten years from Dodowa in Ghana, who were followed up in longitudinal cross sectional study under the Afro-immunoassay morbidity surveillance for eight months. PCR-RFLP was used to characterize these polymorphisms in our study population. The data was related to the clinical data from the morbidity surveillance, and also to immune responses against some vaccine candidate blood-stage antigens. We present the results and discussion of the study.

191

IMMUNOEPIDEMIOLOGY OF PVRII, A PUTATIVE VACCINE CANDIDATE REPRESENTING *PLASMODIUM VIVAX* DUFFY BINDING PROTEIN, IN SRI LANKA

Prasad H. Premaratne[1], Sajani Dias[1], Shiroma M. Handunnetti[2], Syed S. Yazdani[3], Chetan E. Chitnis[3], Preethi V. Randeniya[1]

[1]Department of Zoology, University of Colombo, Sri Lanka, Colombo, Sri Lanka, [2]Malaria Research Unit, University of Colombo, Sri Lanka, Colombo, Sri Lanka, [3]International Centre for Genetic Engineering and Biotechnology, New Delhi, India

Study of naturally acquired antibody responses to a potential vaccine candidate is imperative to provide insights to vaccine development. Recombinant protein PvRII, a putative vaccine candidate representing region II of native *Plasmodium vivax* Duffy Binding Protein (DBP), was used in ELISA to examine the total (IgG+IgM), IgM and IgG isotype antibody responses. A reduction sensitive ELISA was preformed for total antibodies. Sera were collected from acute vivax malaria patients from two endemic areas (EAs) where low and unstable malaria conditions prevail, and from a non-endemic area (NEA) in Sri Lanka. Prevalence of total antibodies was 60% from Colombo (NEA; N=111), 46% from Anuradhapura (EA; N=94) and 41% from Kataragama (EA; N=106). Significantly higher prevalence (Chi square, $P<0.05$) and magnitude (ANOVA, $P<0.01$) of total antibodies were recorded from NEA compared with EAs. Total antibody parameters in all test populations were independent of age of individuals, parasite density and previous exposure. Conformation sensitive anti-PvRII monoclonal antibody 2H10 reacted only with non-reduced PvRII but not with its reduced form. Test sera partially reacted with reduced PvRII, and this indicating the recognition of linear B cell epitopes. A parallel increase in total antibody response to PvRII linear epitopes with increasing exposure was detected in residents of Kataragama. No significant difference was detected among test populations either in anti-PvRII IgM prelavence (Chi square, $P>0.05$) or magnitude (ANOVA, $P>0.05$). Prevalence of IgG3 (Chi