

C3 contributes to the cross-protective immunity induced by Babesia gibsoni phosphoriboprotein P0 against a lethal B. rodhaini infection

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Abstract

We have studied the impact of complement component 3 (C3) deficiency on the progression of lethal *Babesia rodhaini* infection in immune mice. A *B. gibsoni* ribosomal phosphoriboprotein P0 (BgP0) previously reported to be a cross-protective antigen against *Babesia* infection was used to immunize C57BL/6 wild-type (WT) and C3-deficient (C3^{-/-}) mice. Test mice were immunized intraperitoneally (i.p.) with recombinant BgP0 (rBgP0), while controls either were immunized with PBS or did not receive any immunization. Following the immunization regime, test WT mice induced a specifically strong humoral response consisting of mixed immunoglobulins IgG1 and IgG2 associated with high production of IFN- γ in the supernatant of splenocytes. While test C3^{-/-} mice had significantly decreased total IgG, IgG1 and IgG2b responses, the secretions of IL-12 and IFN- γ tended to be lower than those in WT mice. Furthermore, partial protection was only observed in rBgP0-immunized WT mice but not in C3^{-/-} mice or controls. Indeed, rBgP0-immunized WT mice showed significant reductions in the initiation of parasitaemia correlated with delayed mortalities and considerable survival rates. Taken together, our results indicate that cross-protection was impaired in C3^{-/-} mice in view of the decrease in the antibody responses and cytokine production and the high susceptibility to infection.