EXPRESSION OF CD23 BY *SCHISTOSOMA MANSONI* ANTIGEN-ACTIVATED B CELLS OF HIGHLY EXPOSED ADULT MALES ON THE SHORES OF LAKE VICTORIA, WESTERN KENYA

Abstract

Increased B cell membrane CD23 (low affinity IgE receptor) and its soluble cleavage product (sCD23) is related to the development of resistance to re-infection with *Schistosoma mansoni*. CD23 occurs as two isoforms (CD23a and CD23b), whose expression by B cells responding to *S. mansoni* has not been investigated. On the other hand, most studies on IgE role in immunity have mainly revolved around soluble IgE, and rarely on cell surface receptor-bound IgE, although both are now known to play distinct roles. Furthermore, growing evidence indicates that toll-like receptor 4 (TLR4) influences the development of adaptive immunity to helmintic infections, although its relationship with CD23 expression and IgE production remains unclear. While there is evidence of CD23, IgE and TLR4 involvement in immunity to *S. mansoni*, it is unclear how these molecules are co-expressed, in addition to the limited information on the preferential expression of CD23 isoforms following schistosome antigen challenge. This study specifically sought to establish the predominantly expressed CD23 isoform by B cells of individuals infected by *S. mansoni*. The study also determined the relationship between the level of B cell surface CD23 expression and IgE levels. Furthermore, the study established the relationship between CD23 expression and B cell activation, as well as the relationship between the level of CD23 and TLR4 expression by B cells. Study participants were 170 randomly selected adult male sand harvesters and fishermen from three beaches on Lake Victoria and 5 donors from North America. Stool samples were used to diagnose *S. mansoni* infection using Kato-Katz technique. Venous blood was collected for culture B cell isolation, RNA extraction, and for CD23, CD69, CD40 and TLR4 expression determination by flow cytometry. The extracted RNA was used for reverse transcriptase PCR to determine CD23 isoform mRNA expression. Whole blood was used to determine B cell-bound surface IgE. Plasma and culture supernatants were used to run ELISA for IgE and sCD23. This study found CD23b mRNA was predominantly expressed in B cells from *S. mansoni* infected individuals. Circulating B cells had high levels of surface-bound IgE, which positively correlated to B cell surface CD23 expression. B cell expression of TLR4 was strongly associated with CD23 ($p = 0.0285$), and CD69 ($p < 0.0001$) expression. This study concludes that CD23, TLR4 and IgE are all important dusing B cell responses to *S. mansoni*, and are all involved from the time of B cell activation. These findings are important since they boost the understanding on CD23 expression dynamics, revealing its plausible role on B cells in immunity against *S. mansoni*. This study recommends further investigation into B cell CD23 isoform expression, the role of co-expression of surface CD23 and TLR4, following *S. mansoni* infection.

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