

Antibody-independent effects of B cells in multiple sclerosis (MS).

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Research Question and background

B cells are clearly implicated in the pathogenesis of multiple sclerosis (MS). Most research on B cells has focused on (auto) antibody production, but recent success of B cell depletion in MS treatment has renewed interest in B cell antigen presentation capacity. However, the antigen presentation function of B cells in MS is not well understood as studies are mostly limited to experimental autoimmune encephalomyelitis (EAE), the animal model of MS. This project aims to further elucidate antigen presentation by B cells in MS and its role in the activation of autoreactive T cells.

Methods and tissues used

The capacity of peripheral B cells from MS patients to activate autologous T cells by presentation of myelin and other autoantigens was examined. As a part of this study, we measured the expression of costimulatory and major histocompatibility complex (MHC) molecules on B cells from the peripheral blood, cerebrospinal fluid and brain lesions of MS patients and healthy individuals. Immunohistochemistry of CD20, HLA-DR and CD80 was therefore performed on paraffin embedded brain slices of MS patients.

Results and conclusion

Double stainings for CD20 (B cell marker) and HLA-DR (MHC class II) or CD80 (costimulatory molecule) were performed on paraffin-embedded sections from MS brain tissue containing infiltrating B cells (n = 4). The majority of B cells infiltrating MS brain lesions demonstrated expression of HLA-DR and CD80. This indicates their potential to activate (autoreactive) T cells in the MS brain. Flow cytometric analysis further demonstrated an increased expression of costimulatory molecules on B cells from the peripheral blood of MS patients when compared to healthy controls, that was further elevated 2-5 fold in the cerebrospinal fluid. Functional experiments indicated that B cells of MS patients were able to induce autoreactive Th1 and Th17 responses. These data are currently submitted for publication.