HLA-E restricted CD8+ T cell subsets are phenotypically altered in multiple sclerosis patients.

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Research question and background

The importance of Qa-1 restricted CD8+ T cells in regulating autoreactive T cell responses has been demonstrated in animal models for autoimmune disorders, including multiple sclerosis (MS). We hypothesize that their human variant, HLA-E restricted CD8+ T cells, fulfills a similar regulatory role in man and that these cells are of importance in MS.

Methods and tissues used

A large cohort of MS patients and healthy controls was genotyped for the two known HLA-E polymorphisms. Flow cytometry was used to determine HLA-E expression kinetics and to phenotype HLA-E restricted CD8+ T cells. Immunohistochemistry was performed to investigate HLA-E expression in the central nervous system (CNS) of two MS patients and two non-demented controls.

Results and conclusion

HLA-E is upregulated on immune cells upon in vitro activation and this upregulation is polymorphism-dependent for T and B cells. T and B cells in lesions of MS patients show enhanced HLA-E expression. Furthermore, NKG2C+CD8+ T cells of MS patients have a significantly lower Foxp3 expression, while NKG2A+CD8+ T cells of MS patients produce higher levels of pro-inflammatory cytokines compared to those of healthy individuals. Our study indicates that the HLA-E system is altered in MS and could play a regulatory role in disease.