Over-Expression of CD5 on B Lymphocytes Correlates with The Disease Activity in Patients with Relapsing Remitting Multiple Sclerosis

Conference Paper · April 2002
DOI: 10.13140/2.1.2509.5042

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Available from: Osheik Seidi
Retrieved on: 26 April 2016
Background and Objectives:

Multiple sclerosis is an inflammatory disease of the central nervous system (CNS). The pathogenesis of (MS) is not fully understood. T lymphocytes recognising the myelin components of the central nervous are implicated in the initiation of the inflammatory process. There is emerging evidence implicating B lymphocytes and their products in its pathogenesis. B cells expressing the CD5 antigen on their surface are increased in a variety of autoimmune disorders. They were found to be raised in patients with chronic MS.

The relationship between CD5 expression and disease activity or other features of MS is still unknown. Similarly, the connection between CD5 expression and the release of potentially pathogenic antibody has not yet been examined. We sought to investigate the expression of CD5 antigen on peripheral B cells from MS patients and correlate this with clinical and MRI features of disease activity, and the release of myelin-specific autoantibodies.

Table (1)

<table>
<thead>
<tr>
<th>Clinical Group</th>
<th>Total number (females)</th>
<th>Mean Age (years)</th>
</tr>
</thead>
<tbody>
<tr>
<td>Clinically Active MS</td>
<td>13 (9)</td>
<td>40.7 ± 11.1</td>
</tr>
<tr>
<td>Clinically Stable MS</td>
<td>15 (12)</td>
<td>42.9 ± 10.3</td>
</tr>
<tr>
<td>Non-Inflammatory Neurological Controls</td>
<td>23 (11)</td>
<td>39.1 ± 10.1</td>
</tr>
<tr>
<td>inflammatory Neurological Controls</td>
<td>19 (14)</td>
<td>43.2 ± 12.3</td>
</tr>
</tbody>
</table>

Results:

CD5 expression on B lymphocytes is significantly higher in the peripheral blood of patients with Active Relapsing Remitting Multiple Sclerosis (RRMS) – (Figure 2).

No significant differences between the groups in the CD19, CD3, CD4 and CD8 antigen expression – (Figures 3 and 4) respectively.

This finding correlated positively with the more sensitive parameter of disease activity (number of enhancing MRI lesions) but not with the rather crude measure (number of clinical relapses) – (Figure 5).

CD5 over-expression was seen in the early stages of the Active disease – (Figure 6).

CD5 expression correlated positively with the serum titres of autoantibodies against Myelin Basic Protein (MBP) – (Figure 7).

CD5+ B Lymphocytes play an important pathogenic role in active Relapsing Remitting Multiple Sclerosis (RRMS).

These findings increase our current knowledge of the role of B lymphocytes in the pathogenesis of MS.

This might open avenues for new targeted therapeutic approaches in this as yet inadequately treated disorder.

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Figure 1

Representative Flow Cytometry Panels

Figure 2

CD5 Expression on Peripheral Blood B Lymphocytes

Figure 3

Expression of CD19 on Peripheral Blood Lymphocytes

Figure 4

Expression of CD4 and CD8 on T lymphocytes

Figure 5

Correlation Between CD5 Expression on B Lymphocytes and the Disease Activity in RRMS

Figure 6

Correlation Between CD19 Expression on B Lymphocytes and the Duration of Illness

Figure 7

Correlation Between CD8 Expression on B Lymphocytes and the Titres of MBP autoantibodies