NEUROBorreliosis and Intrathecal Synthesis of specific antibodies

SOFTWARE FOR THE EVALUATION OF INTRATHECAL PRODUCTION OF SPECIFIC ANTIBODIES TO BORRELLIA SP.

According to the international recommendation of the European Union Concerted Action on Lyme Borreliosis (EUCALB), evidence of intrathecal antibody production is necessary for diagnosis of early and late neuroborreliosis (i.e. specific antibodies to Borrelia sp. produced in the cerebrospinal fluid (CSF) must be detected).

The antibody level in the CSF depends on the following parameters:

- Antibodies present in blood serum
- Permeability of blood-CSF barrier
- Intrathecal production of antibodies

The presence of specific antibodies as such (in the serum and/or CSF) cannot be deemed sufficient evidence. Antibody Index Software enables evaluation of the Antibody Index (AI) (i.e. ratio of specific antibodies in the CSF to specific antibodies in blood serum in relation to the condition of the blood-CSF barrier and concentration of the total immunoglobulins in the CSF and serum).

MATERIAL REQUIRED

- CSF and serum collected at the same time
- Concentration of albumin, IgG and IgM immunoglobulins in the CSF and serum
- Borrelia AI - Standard IgG
  Borrelia AI - Standard IgM

The Program is intended for the following TestLine kits:
- EIA Borrelia garinii VlsE IgG
- EIA Borrelia garinii IgM
- EIA Borrelia recombinant IgG
- EIA Borrelia recombinant IgM

BRIEF ASSAY PROCEDURE

- Dilute Borrelia AI – IgG, IgM Standard for calibration curve
- Dilute CSF and serum samples
- Perform EIA test
- Calculation of intrathecal production of antibodies according to Reiber using Antibody Index Software
ADVANTAGES

- Small amount of CSF sample needed to determine AI (approx. 0.15 ml)
- Possibility of Antibody Index determination within routine EIA test
- Quick and easy evaluation with Antibody Index Software

EXTERNAL QUALITY ASSESSMENT

The Antibody Index calculation was confirmed as correct by a quality assessment test performed by an external scientific company (Instand e.V.) for detection of intrathecal antibody production according to Reiber in May 2017.

SEROLOGY OF CSF AND SERUM RELATED TO INTRATHECAL ANTIBODY SYNTHESIS AND ANTIBODY INDEX DETERMINATION

<table>
<thead>
<tr>
<th>Serum</th>
<th>CSF</th>
<th>Intrathecal antibody synthesis</th>
<th>AI determination according to Reiber</th>
</tr>
</thead>
<tbody>
<tr>
<td>-</td>
<td>+</td>
<td>Positive</td>
<td>YES - positivity confirmed (EUCALB recommendation)</td>
</tr>
<tr>
<td>+</td>
<td>+</td>
<td>Usually positive, but a passive transfer of antibodies via a disturbed blood-CSF barrier is possible</td>
<td>YES - necessary for detection of intrathecal synthesis</td>
</tr>
<tr>
<td>+</td>
<td>-</td>
<td>Possibly positive (provided that the measured absorbance values in the CSF and serum are close to absorbance of the CUT-OFF control)</td>
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<tr>
<td>-</td>
<td>-</td>
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Calculation of the Antibody Index (AI), a specific CSF/serum index, was established for evaluation of intrathecal antibody production.
The AI expresses the ratio of pathogen-specific antibodies in the CSF to specific antibodies in blood serum in relation to condition of the blood-CSF barrier and concentration of the total immunoglobulins in the CSF and serum.

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V09/2017