Diagnosis of Streptococcal Infection: Previous or Recent

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For the determination of streptococcal infection, it is necessary to test 3 antibodies, i.e., ASO, ASK and ADN-B at a time, and if 2 of the 3 titers are positive one can make diagnosis of fairly recent streptococcal infection, but if only one of the 3 titers are positive, previous or non-specific causes should be considered.

In acute rheumatic fever and acute glomerulonephritis, the determination of an antecedent group A streptococcal infection can be obtained more readily by detection of streptococcal antibodies than by bacteriological examination from throat culture. The antistreptolysin O (ASO) determination is widely used in Japan. A rise in ASO titer can be demonstrated in 75 to 85 per cent of patients with streptococcal infections. The titer usually rises within a week and reaches to the maximal level 3 to 5 weeks after streptococcal infection.

This titer remains usually for 2 to 3 months and declines to pre-infection levels over a period of months.

In some cases, high levels continue for several months especially when one has hypertrophic tonsils, sinusitis or hypersensitivity for streptolysin O.

In these cases, it is difficult by one serum sample to prove if the infection are occurred recently or previously. Otherwise, we have to wait 2 or 3 more weeks for the change of the streptococcal titers or to prove the elevation of plural antibodies.

In this view, the titers of anti-deoxyribonuclease-B (ADN-B), ASO, anti-streptokinase (ASK) and multiple enzyme test (streptozyme test, SZ) were detected in the sera from patients with streptococcal infections and healthy school children, and the determination of recent or previous infection are discussed.

MATERIALS AND METHODS

The streptococcal antibodies were detected in the sera from the patients with active rheumatic fever (21 cases), scarlet fever and other acute streptococcal infections (21 cases), inactive rheumatic patients receiving continuous prophylaxis of penicillin (21 cases), asymptomatic hematuria (65 cases) and normal school children, aged 6–15 (178 cases). The titer more than 333 unit in ASO, 1:1280 in ASK and 1:480 in ADN-B are treated as “positive” in this study.

RESULTS

Percentage of “positive” streptococcal antibodies are shown in Table 1. In acute rheumatic fever and glomerulonephritis, within 3 months since the onset of the diseases, ASO titer greater than 333 unit was observed 86 per cent and 71 per cent of the patients, respectively. Abnormal titers among one of the 3 tests, i.e., ASO, ASK and ADN-B, were revealed 95 per cent in active rheumatic fever and 94 per cent in acute nephritis, but even in inactive rheumatic patients receiving penicillin as prophylaxis, high titers in at least one of the 3 streptococcal antibodies

Key Words:
Anti-deoxyribonuclease-B
Anti-streptolysin O
Streptozyme test

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TABLE 1  SEROLOGICAL FINDINGS OF PATIENTS WITH STREPTOCOCCAL INFECTION

Percentage of “positive” streptococcal antibodies

<table>
<thead>
<tr>
<th></th>
<th>ASO</th>
<th>ASK</th>
<th>ADN-B</th>
<th>at least 1 of 3</th>
<th>at least 2 of 3</th>
<th>all of 3</th>
<th>SZ 100*</th>
<th>SZ 200**</th>
</tr>
</thead>
<tbody>
<tr>
<td><strong>Active rheumatic fever (21 cases)</strong></td>
<td>86</td>
<td>57</td>
<td>71</td>
<td>95</td>
<td>71</td>
<td>48</td>
<td>86</td>
<td>67</td>
</tr>
<tr>
<td><strong>Acute nephritis (17 cases)</strong></td>
<td>71</td>
<td>53</td>
<td>88</td>
<td>94</td>
<td>71</td>
<td>47</td>
<td>65</td>
<td>65</td>
</tr>
<tr>
<td><strong>Scarlet fever &amp; others</strong></td>
<td>44</td>
<td>38</td>
<td>50</td>
<td>80</td>
<td>45</td>
<td>5</td>
<td>69</td>
<td>50</td>
</tr>
<tr>
<td><strong>Asymptomatic hematuria (65 cases)</strong></td>
<td>11</td>
<td>9</td>
<td>46</td>
<td>51</td>
<td>9</td>
<td>6</td>
<td>42</td>
<td>12</td>
</tr>
<tr>
<td><strong>Inactive rheumatic fever (17 cases)</strong></td>
<td>18</td>
<td>6</td>
<td>59</td>
<td>65</td>
<td>18</td>
<td>0</td>
<td>64</td>
<td>43</td>
</tr>
<tr>
<td><strong>Normal controls (178 cases)</strong></td>
<td>11</td>
<td>26</td>
<td>24</td>
<td>46</td>
<td>12</td>
<td>2</td>
<td>42</td>
<td>14</td>
</tr>
</tbody>
</table>

* Streptozyme test at 1:100 serum dilution
** Streptozyme test at 1:200 serum dilution

were observed in 65 per cent of the cases, compared to 46 per cent in normal control. But the “positive” rate in at least 2 of the 3 antibodies was 71 per cent in both acute rheumatic fever and acute nephritis, 18 per cent in inactive rheumatic patients and 12 per cent in normal children.

In 46% of the children with asymptomatic hematuria, found unexpectedly at school physical examinations, “positive” ADN-B titers were observed, but ASO and ASK were lower than that of control group.

Concerning to streptozyme test, 42 per cent of normal school children showed “positive” at 1:100 dilution, but at 1:200 serum dilution, only 14 per cent showed “positive”, while in acute rheumatic fever or acute glomerulonephritis nearly 65 per cent of the patients showed “positive”.

REFERENCES