Streptococcus pyogenes is an important human pathogen with several different clinical manifestations such as pharyngitis, impetigo, and streptococcal toxic shock syndrome (STSS). T serotyping of S. pyogenes has considerable discriminatory power and is easily available for epidemiological investigation. Local public health institutes have performed T serotyping of clinical S. pyogenes strains for over half a decade, and therefore a large amount of epidemiological information is available in Japan.

Using commercially available antisera (Denka Seiken, Co., Tokyo, Japan), we performed T serotyping for 271 strains of S. pyogenes, which were clinically isolated in Aichi Prefecture, Japan in 2003-2007. These strains were obtained from four general hospitals (Toyohashi Municipal Hospital, Okazaki City Hospital, Meijo Hospital, and Ichinomiya Municipal Hospital) that were located in different regions of Aichi.

The 271 strains were classified into 15 different T serotypes and the T untypable group (TUT) (Table 1). Of these T serotypes, 3 (T12, T4, and T1) were dominant (\(n=132, 49\%\)). National surveillance study (http://idsc.nih.go.jp/iasr/index.html) has shown that these 3 T serotypes are also the most common, accounting for over 50% of the clinical strains for the same period. The following numbers of other T serotype strains were identified: T28, 20 (7%); T11, 18 (7%); T25, 17 (6%); and TB3264, 17 (6%). As regards the remaining 8 T serotypes (“Others” in Table 1), there were 6 T3 strains, but less than 4 were identified in each of the other 7 T serotypes such as 5/27/44, T6, T13, T9, 14/49, T8, and T22. There were 45 strains in the TUT group (17%); this percentage is somewhat higher than those of other reports (1,2). In this context, it may be advisable to modify the method of extraction of the T serotype antigen, preferably to an approach involving use of the Streptex kit (Remel, Lenexa, Kans., USA) for preparation of the antigen, which was recently proposed by the Working Group for Beta-Haemolytic Streptococci in Japan.

Of the 271 strains, 185 were isolated from the throat (Fig. 1A). The 3 serotypes (i.e., T12, T4, and T1) were the most common (\(n=98, 53\%\)). The percentages of 5 T serotypes were as follows: T28, 9%; T11, 5%; T25, 5%; TB3264, 5%; and T3, 3%. The results demonstrated that T12, T4, and T1 were the most common among the throat-derived strains, which coincided well with the results obtained by other researchers in Japan (1,2).

Fifty-three strains were obtained from the skin (most strains were derived from pus in suppurative skin lesions) (Fig. 1B). The distribution of the T serotypes in the skin lesions was similar to that of the throat strains. For example, the 3 major T serotypes were also found to be predominant (\(n=20, 37\%\)), although this rate was lower than that in the throat. There are some contradictions regarding prevailing T serotypes in skin strains. Other Japanese researchers reported finding either T11, T28, and TB3264 or else T1, T13, and T13 strains predominately in the skin (3,4). The T serotype-specificity for skin might be lower than that for the throat, although temporal and geographic differences in the sampling should be taken into consideration. The percentage of 4 T serotypes (T11, TB3264, T25, and T28) ranged from 4 to 9%. However, TUT strains were more frequently isolated from the skin than from the throat.

As regards samples from other sites (i.e., sputum in the lower respiratory tract, ear, and vagina), the T serotype distribution differed slightly from those of the throat and skin sites (Fig. 1C); however, the number of samples collected at these sites was limited. Of the 3 major T serotypes, T4 and T1 were predominant, but T12 was the fifth most common T serotype (6%). T25 was alternatively found to be the third most common serotype on the skin (12%). The percentages

Table 1. Distribution of T serotypes in 271 S. pyogenes strains

<table>
<thead>
<tr>
<th>T serotype</th>
<th>No. of strains</th>
</tr>
</thead>
<tbody>
<tr>
<td>T12</td>
<td>53</td>
</tr>
<tr>
<td>T4</td>
<td>43</td>
</tr>
<tr>
<td>T1</td>
<td>36</td>
</tr>
<tr>
<td>T28</td>
<td>20</td>
</tr>
<tr>
<td>T11</td>
<td>18</td>
</tr>
<tr>
<td>T25</td>
<td>17</td>
</tr>
<tr>
<td>TB3264</td>
<td>17</td>
</tr>
<tr>
<td>Others(^1)</td>
<td>22</td>
</tr>
<tr>
<td>TUT</td>
<td>45</td>
</tr>
<tr>
<td><strong>Total</strong></td>
<td><strong>271</strong></td>
</tr>
</tbody>
</table>

\(^1\) Others involve T3, 5/27/44, T6, T13, T9, 14/49, T8, and T22.

\(^{1}\) TUT, T, untypable.

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of T11, TB3264, and T28 ranged from 6 to 9%. As there is still insufficient information regarding T serotype distribution in strains from other sites, future T serotyping of many strains will still be necessary to gain a better understanding of T serotype distribution at other sites.

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