INFLUENZA IN THE EARLY HALF OF THE YEAR 1954 IN JAPAN
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EPIDEMIOLOGICAL DESCRIPTION

Epidemiological descriptions have already been made of the influenza outbreaks in Japan from 1950 until the winter of 1952–1953(1)(2). The last incidence of the influenza outbreak in Japan in this period was the epidemic in the winter of 1952–1953 due to the type A virus. During this epidemic, twenty-seven strains were isolated in Osaka area by Taniguchi et al., most of which were identified as type A, but a few strains of type B were also found among them(3). There were no strains of type B isolated in the same epidemic period in other areas. This epidemic was over in February of 1953, and no outbreak of influenza was reported until the end of the year.

In January, 1954, the Japanese Influenza Center received a report from Miye Prefecture on an influenza outbreak which occurred in about January 20, 1954. Further, there was another report from Nagasaki Prefecture in the last decade of January, 1954. The later report from Nagasaki Prefecture indicated on serological diagnosis that the epidemic was caused by type B virus.

Several strains were isolated from the influenza cases from February to March, 1954, in Osaka area by Okuno et al., who confirmed that they were of type B but antigenically somewhat different from Lee strain(5).

In Fukuoka Prefecture, influenza cases were reported from several places during March to May. Misao and his coworkers confirmed serologically and by virus isolations that this epidemic had also been caused by type B virus(4). Furthermore, Tochigi, Yamanashi, Yamagata, Wakayama, Kagawa and Chiba Prefectures were reported to be involved in influenza outbreaks in April. The outbreak in Yamanashi Prefecture began in April, and was serologically diagnosed as the epidemic of type B virus.

In early May, influenza outbreaks were reported from Ibaragi and Fukushima Prefectures. Serological diagnosis was type B epidemic. One of the present authors (K. J.) was dispatched to Fukushima Prefecture for the epidemiological investigation. The findings of our serological test showed that this outbreak was also due to type B virus. Two strains of influenza B virus were isolated. Their antigenic structure will be described in next paragraph.

In June, sporadic or localized cases of upper respiratory tract were reported
in Tokyo area. Virus isolations were not successful. Thereafter no influenza has been reported until September, 1954.

Generally speaking, the cases of influenza in the above outbreaks were clinically very mild. The epidemiological map is shown in Fig. 1.

Fig. 1. Epidemiological map of influenza in 1954 in Japan

- Epidemic started in January
- " " in February
- " " in March
- " " in April
- " " in May
- " " in June

ANTIGENIC ANALYSES OF THE STRAINS ISOLATED IN 1954

As mentioned above, two strains of type B virus were isolated in Fukushima Prefecture in 1954. They are named as follows:

Fukushima 1–54
Fukushima 2–54
Table 1. Antigenic analyses of the newly isolated strains in comparison with the old ones

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<td>2.7</td>
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<tr>
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<td>T 14</td>
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<tr>
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<td>2.11</td>
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<tr>
<td>Biken 26</td>
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<td>Fukushima</td>
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Table 2. Comparison of the positive rates of Lee and Tokyo 1-52 antigens for serological diagnosis of influenza B

(A) Total cases tested

<table>
<thead>
<tr>
<th>Antigen</th>
<th>Total number examined</th>
<th>Positive cases*</th>
<th>Doubtfully positive cases**</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Lee</td>
<td>43</td>
<td>6</td>
<td>13.9</td>
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<tr>
<td>Tokyo 1-52</td>
<td>39</td>
<td>14</td>
<td>36.0</td>
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</table>

(B) The cases in which Lee and Tokyo 1-52 antigens were employed at the same time

<table>
<thead>
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<th>Antigen</th>
<th>Total number examined</th>
<th>Positive cases*</th>
<th>Doubtfully positive cases**</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td>Number</td>
<td>%</td>
<td>Number</td>
</tr>
<tr>
<td>Lee</td>
<td>32</td>
<td>6</td>
<td>18.8</td>
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<tr>
<td>Tokyo 1-52</td>
<td>32</td>
<td>13</td>
<td>40.6</td>
</tr>
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</table>

* Inhibition titer 8 fold or more higher in the convalescent than in the acute phase
** 4 fold higher in the convalescent than in the acute phase

The strain of type B virus isolated in Osaka area in 1953 is named as Biken 26-53

These B virus strains were antigenically compared with those isolated earlier in Japan and in the United States of America, histories of which can
be seen in the previous publication\(^{(2)}\). The result of the analyses is shown in Table 1. The B strains isolated in 1954 and 1953 are antigenically resembled very much to those isolated in 1952 and in 1949–50 in Tokyo, but slightly different from those isolated in the United States of America in 1948–50 and further, considerably different from Lee strain.

**SEROLOGICAL DIAGNOSIS**

First, we employed mostly Lee strain as the antigen for hemagglutination inhibition test. But Ibaragi sera, for instance, we could hardly obtain positive results for A, A' or B by the use of PR8, FM 1 or Lee strain, and later, when we took the strain Tokyo 1–52, the reaction turned out to be positive for B. Thus, thereafter, both strains were employed for serological diagnosis.

The rates of positive cases by using either Lee of Tokyo 1–52 are shown in Table 2. As seen in it, it is very clear that the positive rate is markedly higher when Tokyo 1–52 was used. But, there were a few cases in which serological diagnosis was positive for Lee strain, while negative for Tokyo 1–52.

**DISCUSSION**

The last country-wide epidemic of influenza B in Japan was the winter of 1949–50, and subsequently a localized outbreak of B was recognized in February to March, 1952, in Tokyo\(^{(2)}\), where no influenza cases of the other type was checked at that time.

No influenza B cases had been recognized thereafter in Japan except for the fact that a few B strains were isolated in Osaka area in the influenza A epidemic of the winter 1952–53. The next epidemic season of influenza began in the early part of 1954 as described above and this was due to type B virus.

An epidemiological map of influenza in the world from November, 1953 to July, 1954 has been made from the data described in "Weekly Epidemiological Record" published by the World Health Organization (Geneve) (Fig. 2). During this period the cases of influenza A and B were scattered all over the world, but there was some tendency that the areas around the Pacific Ocean were mainly prevailed by type B, while European countries were mostly attached by type A. In Australia, Britain and the Union of South Africa, both types were isolated.

The relationship between the prevalence of influenza B in Japan in the early part of 1954 and the world influenza situation of the same period is hard to comprehend, but there may be some correlation among the prevalences of B type in the Pacific area.

**SUMMARY**

1) The epidemic of influenza in Japan in the early part of 1954 was due to type B.
Fig. 2. Recent incidences of influenza in the world

※ Occasionally found.
2) The antigenic structure of the strains isolated during this epidemic was clarified.

3) Discussion was made on the relation of the Japanese epidemic to the world influenza situation.

REFERENCES


(4) Misao, T.: Studies on influenza, presented before the Meeting of the Virus Research Committee supported by the Research Fund of Japanese Ministry of Education, held on September 11, 1954.