Two Cases of Enteric Fever Caused by Salmonella Narasino

Gyoichi Koya, Nozomu Kosakai
The First National Hospital, Tokyo.

And Rintaro Nakaya
The National Institute of Health, Tokyo.

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Salmonella narasino was first isolated from the blood and faeces of a patient with typhoid-like symptoms, and was reported by Nakaguro and Yamashita as a new type of Salmonella in 1938(1).

Since then, there have been no reports relative to any additional clinical cases of this Salmonella infection.(2) Recently, we had opportunities to observe a case of the disease caused by that type of Salmonella and also to obtain an outline of physical examination of another case of this infection, which has been diagnosed in our laboratory as a case caused by the organisms of the same type. The findings of these cases are described in the present report.

Report of Cases

Case 1—Patient Y. H., a male butcher, aged 26, was admitted to The First National Hospital on June 25, 1951, because of fever and frequent diarrhea of 24 hours' duration, associated with general prostration, severe headache, myalgia and nausea, but without vomiting and tenesmus.

Physical examination on admission—General appearance was ill. The respiration seemed somewhat tachipneic and shallow. The pulse rate reached 110 per minute. The blood pressure indicated 130mm Hg systolic and 40mm Hg diastolic. Moderate hyperaemia on the palpebral conjunctivae and sclerae was present. The tongue was dry and thickly coated. The pharynx was found injected reddish without enlargement of tonsils. There was no visible exanthema over the whole body. The auscultation noted of nothing peculiar, except a slight accentuation of the second pulmonal sounds. The abdomen was flat and its wall was found tender. The liver and spleen were not palpable. Hyperperistalsis was noted over
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the ileocoecal, periumbilical and left iliacal regions. There was no localized tenderness over the abdomen. The muscles of the all extremities were tender to pressure. The knee jerk and other reflexes reacted normally.

**Laboratory findings**—The leucocyte count showed 10,800 consisting of 90% polymorphonuclears and 8% lymphocytes and 2% monocytes, but no eosinophils. The erythrocyte count was 3,940,000 with 12.8 g per dl. of hemoglobin. The blood sedimentation rate showed 4 mm an hour (Westergren). Widal reaction was positive in a dilution of 1:40 for typhoid and negative for paratyphoid A and B. There were no abnormal findings in the urine, except a slight transient albuminuria. Specimens of blood and stool taken on admission for the isolation of the causative agent were negative for Shigella and Salmonella, while the specimen of stool taken on June 28 was positive for Salmonella which was later identified as S. narashino serologically.

**Clinical course**—From the day of admission to June 28, the patient’s temperature ranged from 101°F to 104°F with pulse rate ranging from 90 to 120 per minute. The patient continued to complain of severe headache, poor appetite and nausea, but never developed vomiting. The myalgia and arthralgia persisted during the febrile period. The stools were watery with foul odor containing profuse mucus but without blood or pus. Because of severe headache, lumbar puncture was performed on June 27. The cerebrospinal fluid showed no appreciable abnormality. The radiography of the chest revealed nothing peculiar. On June 29, after matched blood transfusion of 100 g followed by some side-effects, the temperature began to fall suddenly, and within 12 hours, it reached to 98.6°F in the evening with pulse rate of 95 per minute, accompanied by symptomatic improvement and became almost afebrile on the following day. Since then, the patient had begun to recover from illness smoothly and was discharged on July 8, 1951.

The agglutination tests with the patient’s serum to the isolated organism were positive in a dilution of 1:80 on July 1 and 1:320 on July 8. Repeated attempts to isolate the causative agent from blood, faeces and urine turned out negative all the time for S. narashino, except once.

**Case 2**—Patient M. A., a male employee, aged 32, visited a physician for consultation on July 5, 1951, because of fever and gastric discomfort
of about 12 hours' duration without appreciable history.

Clinical findings at the first physical examination (according to the consulting physician)—The general appearance was almost normal, except the redness of his face with the temperature of 101°F and pulse rate of 70 per minute. The pharyngeal mucosa was injected and tonsils were swollen. The tongue was dry and thickly coated. Physical examination of the chest showed no abnormality, except a slight dullness on percussion in the left interscapular region. The abdomen concaved and soft. He felt pain upon pressing over the epigastrium, but no hyperperistalsis was noted. The liver and spleen were inpalpable.

Clinical course—From the onset to July 10, the temperature ranged from 101°F to 102.6°F with the pulse rate of 80 or 90 per minute. The patient complained of moderate haedache and anorexia on July 8, and leucocyte count resulted in 10,000 on the same day. Blood sedimentation rate showed 22 mm an hour. Because of the persistent high fever associated with relative bradicardia, typhoid fever was suspected by the consulting physician, who requested our clinical laboratory to perform bacteriological examinations on patient’s blood and faeces taken on July 9, 1951. Widal reaction was positive for typhoid in a dilution of 1:40 and negative for paratyphoid A and B. Blood culture gave a growth of Salmonella narashino, while the culture of faeces happened to turn out negative for the same organism. Since July 11, the temperature began to fall from 101.5°F in average, and within 24 hours it dropped to 99.5°F. The pulse rate decreased to 64 per minute. There was a marked symptomatic improvement during this period except for a slight headache which diminished next day. The agglutination test on the patient’s serum taken on July 22, 1951, was positive in a dilution of 1:40 for S. narasino.

Table 1 Biochemical Reactions

<table>
<thead>
<tr>
<th>Name of Strain</th>
<th>Glucose</th>
<th>Lactose</th>
<th>Sucrose</th>
<th>Mannitol</th>
<th>Salicin</th>
<th>Adonitol</th>
<th>Dextrotol</th>
<th>Sorbitol</th>
<th>Inositol</th>
<th>Maltose</th>
<th>Arabinose</th>
<th>Rhamnose</th>
<th>Xylose</th>
<th>Trehalose</th>
<th>Indol</th>
<th>M. R.</th>
<th>V. P.</th>
<th>Citrate</th>
<th>H₂S</th>
<th>Urea</th>
<th>Gelatin</th>
</tr>
</thead>
<tbody>
<tr>
<td>Y. H.</td>
<td>+</td>
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<tr>
<td>M. A.</td>
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</table>
According to the bacteriological examinations carried out by us, the organisms isolated from these two cases are Gram negative, motile rods. Their biological and serological characteristics are shown in Tables 1 and 2. They are identified as S. narashino.

<table>
<thead>
<tr>
<th>Name of Strain</th>
<th>0</th>
<th>H</th>
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</thead>
<tbody>
<tr>
<td></td>
<td>VI, VIII</td>
<td></td>
</tr>
<tr>
<td>Y. H.</td>
<td>a</td>
<td>e,n,x...</td>
</tr>
<tr>
<td>M. A.</td>
<td>a</td>
<td>e,n,x...</td>
</tr>
</tbody>
</table>

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**COMMENT**

From the clinical findings of these two cases and from the considerations of those of the previous cases reported by Nakaguro and his coworker, the clinical features of the infection induced by S. narashino should be thought as follows:

1. Because of persisting high fever with relative bradicardia, greyish thickly coated dry tongue and headache, the case might be suspected of typhoid or paratyphoid fever, but consciousness is always clear and no roseola or other rashes are observed and no enlargement of spleen is noted. Diazoreaction of the urine is negative.

2. Because of frequent diarrhea, associated with the enteric disorders such as anorexia, nausea and abdominal hyperperistalsis, the case might be suspected of bacillary dysentery, but neither cramping abdominal pain nor tenesmus is observed. Stools are loose or watery with foul odor containing mucus but without blood or pus.

3. Marked myalgia and hyperemia on the conjunctivae and pharynx are recognized during the febrile period, which persist usually for about week with the average of 102° F.

4. Blood picture: Moderate leucocytosis with relative lymphopenia is common. However, Nakaguro's case showed leucopenia.

5. The causative organism isolated from blood and faeces, though the rate of detection is very low.

6. The agglutinin titre of patient's serum to the isolated organisms has been increased with the course of the disease.
ENTERIC FEVER

SUMMARY

We experienced two cases of Salmonellosis caused by Salmonella narashino and described their clinical features, which make us to diagnose them as enteric fever.

We would like to thank Dr. Y. Koyama of The First National Hospital for encouragement and kind criticism, and we wish to express our thanks to Dr. H. Fukumi of The National Institute of Health for much helpful advice and constructive criticism.

REFERENCES