Chemoprophylaxis of Leprosy Contacts with D.D.S.*

Joon Lew and Young Soo Kim

Department of Microbiology, College of Medicine, Yonsei University, and
World Vision Special Skin Clinic Leprosy Center, Seoul, Korea

(Received for Publication: December 5, 1966)

ABSTRACT

D.D.S. (Diamino-Diphenyl-Sulfone) has been accepted as the first choice in the treatment of leprosy. This compound is relatively toxic but effective in all types of leprosy, and can be used for prolonged periods of time with almost negligible drug resistance and at very low cost.

Leprosy is an extraordinarily chronic disease with an exceptionally prolonged incubation period.

It is a well accepted practice to use chloroquine for malaria, penicillin for syphilis, and INH for tuberculosis as an agent of chemoprophylaxis.

Leprosy is a disease that occurs chiefly among the poorer people in poverty stricken countries. Contacts with leprosy patients, particularly household contacts in such countries, are inevitable. An effective measure of prevention, if any, is greatly to be desired.

Lew and Lee (1960) reported the results of the chemoprophylaxis of leprosy contacts with D.D.S.

Seven hundred and sixty children born to leprous individuals were divided into two groups, the first group, 325 children, were given D.D.S. 50-300 mg. weekly for a period of 7 months to 5 years and the second group, 435 children, were not given any prophylactic measures but observed as controls for a similar period of time.

Among the experimental group, the first group of 325 children developed no leprosy, while in the second group 31 children (7.1%) out of 435 developed leprosy.

Nine suspicious cases of leprosy with hypopigmented skin patches were identified among the first group of 325 children while they were under preventive medication but those lesions gradually disappeared.

Two cases of leprosy, indeterminate group, were identified about two years after stopping medication among the first group of 325 children.

Another experiment on chemoprophylaxis is being conducted. In the first group, (experimental group); there were 778 household contacts from 156 bacteriologically positive leprosy patients who have been medicated only with D.D.S. at the leprosy center. The dosage of D.D.S. was paralleled to the dosage of leprosy patients whose maximum dosage was fixed to 400 mg. per week.

At present these contacts have been followed for a period of one to seven years. None of leprosy incidences were identified during this observation period among those 778 D.D.S.-medicated contacts.

In the second group, (control group); there were 749 individuals who were the household contacts of 160 leprosy patients in Kangwondo province. These contacts were not protected by D.D.S., nor by B.C.G.

This group have been followed for the past one to seven years during which time only the index cases (leprosy patients among the families) were medicated with D.D.S.

Forty-four cases of leprosy (5.9%) among 749 household contacts were identified from the past 1 to 30 year period.

---

*The content of this communication was reported at U.S.-Japan Science Conference held in Tokyo, Japan, May 1966.
CHEMOPROPHYLAXIS OF LEPROSY CONTACTS WITH D.D.S.

Thirteen (1.7%) out of 44 cases (5.9%) of leprosy among the 749 household contacts were identified during the period of 1 to 7 years observation while there was no leprosy incidence among the D.D.S.-medicated 778 contacts in the first group experiment.

INTRODUCTION

D.D.S. (Diamino-Diphenyl-Sulfone) has been accepted as the first choice in the treatment of leprosy. This compound is effective in all types of leprosy, yet it is relatively toxic and can be used for prolonged periods of time with almost negligible drug resistance and at very low cost.

Leprosy is an extraordinarily chronic disease with an exceptionally prolonged incubation period. Chloroquine for malaria has been studied and used (Belding, 1952; Clyde, 1959), penicillin for syphilis, (Andrews and Domonkos, 1963) and INH for tuberculosis (WHO Chronicle, 1965; Payne, 1957) as an agent of chemoprophylaxis.

Leprosy is a disease that occurs chiefly among the poorer people in poverty-stricken countries. Contacts with leprosy patients, particularly household contacts in such countries, are inevitable. An effective measure of prevention, if any, is greatly to be desired.

Since D.D.S. has been considered as a good suppressive agent to Mycobacterium leprae in the host, the idea of eliminating the organism in the host tissue when they have not multiplied abundantly enough to bring the host in a state of blown-up leprosy is speculated.

Leprosy is an extreme example of a long incubation period among the infections diseases. The idea is to eliminate the organism in the host tissue or to interfere the host-parasite relationship during its incubation period by the administration of D.D.S. as a chemoprophylactic measure.

The possibility of chemoprophylaxis of leprosy with D.D.S. has been reported or speculated upon (Lew and Lee 1960; Dharmendra, 1965).

To prove this idea in practice, two separate field experiments were organized.

EXPERIMENTAL DATA

1. The first experiment was the chemoprophylaxis of leprosy-born children with D.D.S. at various preventoria (Lew and Lee, 1960)

Materials:

There were 760 leprosy-born children in various preventoria. These children were separated from their leprosy parents at leprosaria at 6 years of age or above and their age range was between 6 to 18 years. These children had a very intimate contact with their leprosy parents or some other leprosy patients at each respective leprosarium where they were grown up before the separation was taken place.

Methods:

These 760 children were divided into two groups, an experimental group of 325, and a control group of 435. The experimental group of 325 children, were treated with D.D.S., orally, a weekly dosage of 50mg. to 150mg. for the children of 6 to 13 years of age and 150mg. to 300 mg. for those 14 to 18 years of age. The medicine was given 4 to 6 times a week.

The administration of D.D.S. was supervised by a nurse and the children in this experiment were examined periodically with clinical observations, skin scraping of the Ridley technic and trypsin digestion method (Lew and Chung, 1959) with biopsy for bacteriology for the identification of leprosy incidence.

The control group of 435 children did not receive D.D.S. but they were similarly observed for leprosy incidence.

The duration of observation was 7 months to 5 years in this experiment.

Results and summary: (Table 1.)

Among the experimental groups, the first group of 325 children developed no leprosy, while
in the second group 31 children (7.1\%) out of 435 developed leprosy.

Nine suspicious cases of leprosy with hypopigmented skin patches were identified among the first group of 325 children while they were under preventive medication but those lesions gradually disappeared.

Two cases of leprosy, indeterminate group, were identified about two years after stopping medication in the first group of 325 children.

Another experiment on chemoprophylaxis is being conducted.

2. The second experiment is the chemoprophylaxis with D.D.S. of leprosy contacts in the home

This project is under way as an observation and the following data will be a preliminary report.

Materials:

The experimental group is consisted of 778 household contacts from 156 bacteriologically positive leprosy patients who have been continuously cared for and followed at the World Vision Special Skin Clinic(W.V.S.S.C.) in Seoul. Those 778 household contacts have been both male and female, old and young, poor and otherwise.

The control group of 749 individuals are the household contacts from 160 leprosy patients of various types in Kangwon-do province. Their sex, age and living status are similar to the family contacts of the experimental group at the W.V. S.S.C.

In both groups, the contacts are living in their own homes where some of their family members are leprosy patients.

Methods:

D.D.S. as chemoprophylactic drug has been given to the experimental group of 778 household contacts.

The dosage of D.D.S. is equivalent to the dosage for leprosy patients by body weight per kilogram. The maximum dosage of D.D.S. for the prophylactic use has been fixed to 400 mg. weekly and the medication was administered orally 3 times in a week until the index cases became bacteriologically negative and clinically arrested. Although the maximum dosage was fixed at 400 mg. weekly, most of the contacts were given 300 mg. weekly.

The control group of 749 household contacts in Kangwon-do province are not protected by D.D.S. nor by B.C.G. vaccination.

The contacts from both groups are periodically examined by clinical observation, bacteriological examination and skin biopsy whenever it is needed for the confirmation of leprosy.

These contacts in both the experimental and the control groups have been followed for a period of 1 to 7 years. In the control group only the index cases (leprosy patients among the families) are treated with D.D.S.

Results and summary: (Table 2, 3 and Fig.1.)

In the treated group, 778 contacts have revealed no leprosy incidence during the observation period of 1 to 7 years.

The control group of 749 household contacts developed 13 cases of leprosy (1.7\%) incidence during 1 to 7 year observation period while there was no leprosy incidence among the 778 D.D.S. protected contacts of the experimental group.

<table>
<thead>
<tr>
<th>Exp. group</th>
<th>Preventive medication</th>
<th>Observation period</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Leproly born children</td>
<td>325</td>
<td>50—300 mg/w</td>
<td>7m.—5yrs.</td>
</tr>
<tr>
<td>Control</td>
<td>435</td>
<td>None</td>
<td>7m.—5yrs.</td>
</tr>
</tbody>
</table>
CHEMOPROPHYLAXIS OF LEPROSY CONTACTS WITH D.D.S.

Table 2. Incidence of leprosy among contacts

<table>
<thead>
<tr>
<th>Group</th>
<th>Contacts</th>
<th>Preventive medication</th>
<th>Observation period</th>
<th>Incidence</th>
</tr>
</thead>
<tbody>
<tr>
<td>Exp. Group</td>
<td>W.V.S.S.C. 778</td>
<td>100-300mg/w</td>
<td>1-7 Yrs.</td>
<td>0/778</td>
</tr>
<tr>
<td>Control</td>
<td>Kangwon-Do 749</td>
<td>None</td>
<td>1-7 Yrs.</td>
<td>13/749 (1.7%)</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>1-30 Yrs.</td>
<td>44/749 (5.9%)</td>
</tr>
</tbody>
</table>

Table 3. The incidence of leprosy among contacts and the period of medication to the index cases in Kangwon-Do.

<table>
<thead>
<tr>
<th>Type of index case</th>
<th>Type of secondary case</th>
<th>Period of D.D.S. medication to index case at the time of secondary case found</th>
<th>Number of secondary case by the year of medication to the index case</th>
</tr>
</thead>
<tbody>
<tr>
<td>Lepromatous type</td>
<td>Indeterminate</td>
<td>3m.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Tuberculoid</td>
<td>4m.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Indeterminate</td>
<td>6m.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Indeterminate</td>
<td>9m.</td>
<td>1</td>
</tr>
<tr>
<td></td>
<td>Indeterminate</td>
<td>10m.</td>
<td>1</td>
</tr>
</tbody>
</table>

Lepromatous type

| Indeterminate      | 1⅓/12 Yrs.            | 2 Yrs.                                                                           | 1                                                                   |
| Lepromatous        | 2 Yrs.                |                                                                                  | 1                                                                   |
| Indeterminate      | 2⅔/12 Yrs.            |                                                                                  | 2                                                                   |

Lepromatous type

| Tuberculoid        | 2⅔/12 Yrs.            |                                                                                  | 1                                                                   |
| Indeterminate      | 2⅔/12 Yrs.            |                                                                                  | 1                                                                   |

Lepromatous type

| Indeterminate      | 4 Yrs.                |                                                                                  | 1 Case                                                              |

Lepromatous type

| Indeterminate      | 5 Yrs.                |                                                                                  | 1 Case                                                              |

Fig. 1. Period of D.D.S. medication to the contacts at W.V.S.S.C.
When the household contacts of the control group were carefully surveyed and questioned about incidence of leprosy even before our research project started, 44 cases of leprosy incidence (5.9%) among 749 household contacts of control group were identified as leprosy for the past 1 to 30 year period.

Those 13 cases of leprosy among the contacts of the control group are all from lepromatous type cases. In the 13 cases that developed disease in the control group all were an indeterminate group except for 2 tuberculoid and 1 lepromatous type case. Five cases among these 13 cases were identified within one year after starting the treatment of the index cases and four cases were diagnosed in the second year, 2 cases in the third year, 1 case in the fourth year and 1 case in the fifth year and thereafter no incidence of leprosy has been identified.

REFERENCES


