Prevention of Rheumatic Fever

Acute rheumatic fever (ARF) and chronic rheumatic cardiopathy (CRC) are high on the list of causes of death from cardiovascular disease among adolescents and young adults. These diseases are also a common cause of morbidity and extended disability.

In recent decades the incidence of acute attacks of rheumatic fever has declined sharply in developed countries and also, but to a lesser extent, in developing ones. This may be associated not only with medical measures but also with better general living conditions in many communities.

CRC, on the other hand, continues to be a significant though diminished cause of morbidity, disability, and mortality, as a secondary consequence of severe, past attacks of rheumatic fever. This holds true for developing countries and also some developed countries.

Information available on hospital discharges shows that ARF and CRC are still important causes of morbidity. Data from four countries—Canada (1972), Ecuador (1973), Paraguay (1975), and Venezuela (1973)—indicate the following:

In the total population, of every 1,000 hospital discharges of patients admitted for all causes, the proportion of ARF patients ranged from 0.5 in Canada to 1.7 in Paraguay and Venezuela. In the 5-14 year group the proportion was also low in Canada (2.2), but reached as high as 6.1 in Ecuador, 9.4 in Venezuela, and 11.5 in Paraguay. The proportion declined in the 15-24 year group, in which the highest rate was 2.2 in Venezuela. The decline was even greater in the 25-44 year group.

CRC as the cause of hospitalization of patients subsequently discharged ranged from 0.1 in Paraguay to 2.4 in Canada. These figures are based on hospital discharges of patients in all age groups.

Figure 1 provides the latest available information on ARF and CRC death rates in six countries of the Americas: Argentina (1978), Canada (1977), Cuba (1977), Guatemala (1976), Mexico (1974), and Venezuela (1977).

Acute attacks of rheumatic fever occur most frequently between the ages of 5 and 15, after which the frequency declines. They seldom occur in children under 5.

ARF may attack the joints, the heart, and the central nervous system. Its most important clinical manifestations are arthritis, carditis, and chorea. The joints are the most common but least important site of the disease, as there is no permanent damage. CRC is more serious because it poses a direct threat that persists beyond the acute stage, can cause permanent damage, and may evolve unfavorably and become graver if there are further attacks of ARF.

There is a close relationship between ARF and the in-
Mortality due to acute rheumatic fever and chronic rheumatic cardiopathy in six countries of the Americas, by age-group.

<table>
<thead>
<tr>
<th>Age Group</th>
<th>Acute Rheumatic Fever</th>
<th>Chronic Rheumatic Cardiopathy</th>
</tr>
</thead>
<tbody>
<tr>
<td>All Ages</td>
<td></td>
<td></td>
</tr>
<tr>
<td>5-9</td>
<td></td>
<td></td>
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<tr>
<td>10-14</td>
<td></td>
<td></td>
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<tr>
<td>15-19</td>
<td></td>
<td></td>
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<tr>
<td>20-24</td>
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</tbody>
</table>

All children in the group at greatest risk (5-15 years) suffer an average of one infection of the respiratory tract per year. If this infection is due to group A beta-hemolytic streptococci, there is a risk that an attack of ARF will follow the infection. Even under nonepidemic conditions, this will occur in 3 or 4 of each 1,000 infections. In special situations, particularly in closed environments (asylums, barracks, etc.) that favor the dissemination of germs, the proportion increases to 3 or 4 per 100 infections.

There are more than 60 types of group A beta-hemolytic streptococci, with no cross-immunity among them. For this reason, a person who has been infected by a given type is immunized only against that particular type but remains susceptible to all other types of streptococci. The risk of streptococcal infection may therefore be considered a continuing possibility.

People who have had rheumatic fever are at high risk of suffering a new and severe attack if again infected by streptococci. This risk increases directly and proportionately with the following factors: the youth of the patient; the number of earlier attacks of ARF; the severity of the residual cardiac lesion (CRC); the closeness in time between the last acute attack and the new streptococci infection; and the number of days elapsed between the onset of the infection and the beginning of treatment to eliminate the streptococci.

The prevention of streptococcus infection was proposed a long time ago and is now being applied, although regretfully not on as wide a scale as desirable.

Rheumatic cardiopathy is one of the few chronic cardiopathies that can be prevented by means at present available. The ideal way to prevent it would seem to be to prevent the initial attack of rheumatic fever by warding off the streptococcus infection or treating it promptly when it appears (primary prevention). Since there is no way of identifying those susceptible to rheumatic fever, it would be advisable to protect the entire population, or at least those in the age at greatest risk, but this would not be practicable as a control measure.

However, it is possible to focus preventive action on the

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groups at greatest risk, such as people who are known to be susceptible because they have suffered from rheumatic fever or have had a chronic rheumatic cardiopathy. Such action lies in adequate treatment or prevention of rheumatic infection. Either way, an attack of ARF and, consequently, cardiac damage, are prevented (secondary prevention).

Results throughout the world have shown the beneficial effects of applying these measures. Limited experiments conducted in specialized centers in seven countries of the Region participating in a PAHO-coordinated collaborative study have demonstrated the feasibility of control programs aimed at selected groups in the community. Centers in Argentina, Bolivia, Brazil, Chile, Ecuador, Peru, and Venezuela are participating in the study, in which 2,500 patients with active rheumatic fever or a history of having had the disease were initially registered. The patients are being kept under treatment with monthly injections of benzathine penicillin, and their adherence to the treatment and the clinical evolution of the disease are checked yearly.

Preliminary results indicate that when patients are examined periodically and receive their preventive injections on a regular basis, protection against further streptococcus infection is effective in direct proportion to the regularity of the treatment. In 1,110 patients that were receiving monthly intramuscular injections of benzathine penicillin, the number of streptococcus infection detected during the year of observation was recorded and correlated with the number of monthly injections received. It was found that the percentage of patients remaining free of streptococcus infection increased in direct proportion with the strictness of observance of the preventive regime, as shown in Table 1.

The most commonly used schemes of preventive treatment are indicated below:

For primary prevention, the following scheme is recommended for early treatment of streptococcus infection:

**Benzathine penicillin, intramuscular injection, 1 injection**

Dose: 1,200,000 units for patients 6 years or older

600,000 units for children under 6

**or**

**Erythromycin, oral, every day for 10 days***

Dose: 250 mg, 4 times per day, for patients 6 years or older

125 mg, 4 times per day, for children under 6

For secondary prevention of rheumatic fever, those susceptible will be protected by the following scheme:

**Benzathine penicillin, intramuscular injection, once per month, for a number of years**

Dose: The same as indicated for the treatment of the infection

**or**

**Sulfadiazine, oral, every day, for a number of years**

Dose: 1 g per day for patients 12 years or older

0.5 g for patients under 12

If streptococcus infection occurs during the interval between penicillin injections in a patient who has been following this preventive scheme, or if the patient takes sulfadiazine at any time, the patient should be given an intramuscular injection of benzathine penicillin at the proper dose for age. It is imperative to note that sulfadiazine is generally effective as a preventive agent but should never be used to treat an infection that already exists.

The prophylactic schemes should be widely publicized so that they become a part of the habitual therapeutic methods of general physicians and are known and applied at all levels of medical care services, including the primary level.

In developed countries with the necessary resources for providing adequate medical care, primary prevention is carried out by specifically treating the streptococcus infection after it has been identified by bacteriologic examination (culture of the pharyngeal exudate). This system requires a waiting period of 18-24 hours to determine the test results. This delay does not imply an important risk because the treatment to eliminate the strep-

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*It is very important to remember that when the treatment is given orally this dose should be maintained for the entire period of 10 days, even if the clinical state of the patient improves.

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### Table 1. Cases of rheumatic fever with results of first yearly examination, classified according to number of attacks of streptococcus pharyngitis from the time of initial registration and to regularity of preventive treatment.

<table>
<thead>
<tr>
<th>No. of injections of benzathine penicillin in 1 year</th>
<th>Total (100%)</th>
<th>None</th>
<th>%</th>
<th>One</th>
<th>Two or more</th>
<th>Suspected</th>
</tr>
</thead>
<tbody>
<tr>
<td>11-12</td>
<td>989</td>
<td>928</td>
<td>93.8</td>
<td>25</td>
<td>9</td>
<td>0.9</td>
</tr>
<tr>
<td>8-10</td>
<td>70</td>
<td>58</td>
<td>82.6</td>
<td>6</td>
<td>2</td>
<td>2.9</td>
</tr>
<tr>
<td>0-7</td>
<td>51</td>
<td>40</td>
<td>78.4</td>
<td>1</td>
<td>-</td>
<td>-</td>
</tr>
<tr>
<td>Total</td>
<td>1,110</td>
<td>1,026</td>
<td>92.4</td>
<td>32</td>
<td>11</td>
<td>1.0</td>
</tr>
</tbody>
</table>

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to cocci, if correctly applied, is effective if given at any time during the first week of this infection. Once the infection is confirmed, the patient is treated with the appropriate antibiotic. The rules of sound medical care should be applied, with no unnecessary administration of antibiotics.

In order to apply successfully the preventive measures at community level, it is necessary to employ strategies that make it possible to obtain optimum results with simple, effective, and acceptable elements. If treatment of the streptococcus infection is to be delayed until the infection is confirmed by bacteriologic examination (culture of the pharyngeal exudates), the patient should visit the medical care facility twice after the findings are known.

These requirements are applicable and beneficial when circumstances allow them to be applied, but this is not always feasible in the context of a control program, the end of which must be to protect large population groups. Efforts to apply the scheme could lead to difficulties that would prevent the program from achieving wide coverage, since in many parts of the Region there are population groups that have little access to fairly sophisticated medical care facilities. For proper coverage the protective measures should be applied at all levels, including, if possible, the primary level. In order to attain this latter objective it is advisable to include, as routine tasks, some of the procedures related to the control measures mentioned above. These procedures would include, among others, the identification of cases of infection of the upper respiratory tract which is very likely to be caused by streptococci, treatment with an injection of benzathine penicillin in accordance with the proposed scheme, and, when appropriate, the application of secondary prophylaxis to patients who have suffered from rheumatic fever.

The activities to be carried out at various levels of the health care services should be programmed so as to allow optimal utilization of available resources. A guide for the programming of activities, including the allocation of functions to staff and calculation of necessary resources, as well as a guide for supervision and evaluation, form part of the publication prepared by PAHO entitled Normas de prevención de la fiebre reumática en la comunidad, which will be published in 1980.

It is anticipated that the guides proposed by PAHO can be adapted to the local requirements and resources of the countries that consider it necessary to do so.

It may be possible to solve the health problem of ARF and CRC when an effective vaccine is available for the various types of streptococci, and such a possibility is being investigated. At this time, however, the solution best geared to the means now at hand lies in wide and continuous application of the preventive measures described above.

(Source: Noncommunicable Disease Unit, Rheumatic Fever Prevention Program, PAHO.)

Notification of Communicable Diseases in the Americas

The international notification of communicable diseases in the Americas is mandated by Articles 3-8 of the Pan American Sanitary Code and Part II of the International Health Regulations. The Pan American Health Organization receives information from the following sources:

- Telegrams from the countries of the Region reporting cases of diseases subject to the International Health Regulations or of alarming situations, outbreaks, or epidemics of other infectious diseases.
- Weekly and/or monthly statistical reports prepared by the ministries of health of the countries and supplied on the PAHO international form.
- Epidemiological bulletins (see Table 1) and other official publications of the ministries of health.

PAHO, in turn, relays the epidemiological information of international interest to the countries pursuant to the Pan American Sanitary Code and the International Health Regulations. It does so in the following way:

1. When a Member Country notifies PAHO of cases and/or deaths due to diseases covered by the International Regulations, this information is immediately relayed to all the countries of the Region by telegram.
2. The data mentioned in paragraph 1 are also relayed by telegraph to WHO Headquarters in Geneva, where