The Prevention of Rheumatic Fever

RHEUMATIC FEVER is a recurrent disease which can be prevented. It is now generally agreed that both the initial and recurrent attacks of the disease are usually precipitated by infections with beta hemolytic streptococci. Therefore, the prevention of rheumatic fever and rheumatic heart disease depends upon the control of streptococcal illnesses. This may be successfully accomplished by early and adequate treatment of streptococcal infections in all individuals and by prevention of streptococcal infections in rheumatic subjects.

Treatment of Streptococcal Infections

In the general population at least 3 percent of untreated streptococcal infections are followed by rheumatic fever. Among certain individuals, especially those with previous rheumatic fever, the incidence is much higher. Adequate and early penicillin treatment, however, will prevent most attacks of rheumatic fever and eliminate streptococci from the throat.

Diagnosis

In most instances it is possible to recognize streptococcal infections by their clinical manifestations but laboratory tests may assist in establishing the diagnosis.

Epidemiology

The seasonal pattern and presence of similar cases in the community or household may be helpful. For example, streptococcal infections in the northern United States are most common from January through June. Likewise, a case of scarlet fever in one child would suggest that a sore throat in another has the same etiology.

Symptoms

Sore throat—onset sudden, in the tonsillar area, not in the trachea.

Headache—common.

Fever—variable, but generally from 101° to 104° F.

Abdominal pain—common, especially in children. Not too common in adults, but does occur.

Nausea and vomiting—common, especially in children.

These symptoms are usually *not* present: (1) simple coryza; (2) cough; (3) hoarseness.

Signs

Red throat—frequently beefy red, but if seen early the redness may be mild.

Exudate—usually present.

Glands—swollen, tender tonsillar glands at angle of jaw.

Rash—scarlatiniform (characteristic of scarlet fever, not common).

Discharge—otitis media and sinusitis indicated by (serous or purulent) aural or nasal

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This statement was released for publication this month by the Council on Rheumatic Fever and Congenital Heart Disease of the American Heart Association. It was prepared by the council's committee on prevention of rheumatic fever of which Burtis B. Breese, M.D., is chairman and the following are members: Marjorie T. Bellows, Edward E. Fischel, M.D., Ann Kuttner, M.D., Benedict F. Massell, M.D., Charles H. Rammelkamp, Jr., M.D., and Edward R. Schlesinger, M.D.

discharge are frequent complications of streptococcal pharyngitis.

Laboratory

White blood count—generally over 12,000 and in children frequently over 20,000.

Throat culture—positive for hemolytic streptococci.

Therapeutic Response

Almost without exception patients with streptococcal infections are vastly improved within 24 hours after penicillin has been started and the temperature normal, or nearly so. This therapeutic response is characteristic and if it does not occur, the chances are much against the disease being due to hemolytic streptococci.

Treatment

In order to be effective, treatment should be started immediately when a streptococcal infection is suspected and continued for sufficient time to eradicate the streptococci from the throat.

Penicillin is the drug of choice for treating streptococcal infections.

Both the oral and the intramuscular routes of administration have been utilized successfully for penicillin therapy of streptococcal infections. Intramuscular injections have been proved to prevent rheumatic fever. The data on the value of oral penicillin as a preventive are less complete.

Oral administration in comparison to intramuscular administration has these advantages:

1. It is not as distasteful to many patients.
2. It requires fewer physician visits.

It has these disadvantages:

1. Larger amounts of penicillin must be used.
2. It is difficult to administer to vomiting or refractory children.
3. In some adults it gives rise to persistent diarrhea and pruritus ani.
4. It is difficult to be sure that treatment is continued for sufficient time and given in proper relation to meals to be effective.

RECOMMENDED SCHEDULES

Intramuscular Penicillin

Children—one intramuscular injection of 300,000 units of procaine penicillin with aluminum monostearate in oil *every third day for three doses.*

Adults—one intramuscular injection of 600,000 units procaine penicillin in aluminum monostearate *every third day for three doses.*

NOTE: Less preferable, but usually effective—two doses as above at 3-day intervals.

Oral Penicillin

First 5 days: 200,000 to 300,000 units ½ to 1 hour before meals and at bedtime (total of 800,000 to 1.2 million units per day in four divided doses. Lesser amounts for children; larger amounts for adults).

Second 5 days: 200,000 to 250,000 units ½ to 1 hour before meals (total 600,000 to 750,000 units per day in three divided doses).

NOTE: To be effective, therapy should be continued for the entire 10 days even though the temperature may return to normal and the patient may feel better within 1 or 2 days.

Combination of Intramuscular and Oral Penicillin

Therapy may begin with one injection of penicillin (300,000 units procaine pencillin with aluminum monostearate in oil) and then, beginning 3 days after the injection, continued for an additional 7 days with oral penicillin according to the schedule outlined above for the second 5 days.

Other Medication

Aureomycin: Less effective than penicillin in controlling streptococcal infection but it is especially useful in those sensitive to penicillin. Dosage: Total 10 mg. per pound of body weight in four divided doses daily for 2 days. Cut dose in half for remaining 8 days of therapy.

New preparations of penicillin: These may be effective and even preferable to the treatment schedules outlined, but at present they have not had sufficient trial to warrant their recommendation.

Other antibiotics: At present there are inadequate data on their value.

Not recommended for treatment

Penicillin troches or lozenges.

Penicillin followed by sulfonamides.
Sulfonamide drugs.

NOTE: Recurrences of streptococcal infection should be treated as primary attacks.

Prevention of Streptococcal Infections

General Rules for Prophylaxis

Who should be treated?

All individuals under the age of 18 who have had rheumatic fever or chorea and all those over this age who have had an attack within 5 years.

When should prophylactic treatment be initiated?

At the end of the second week of the attack of rheumatic fever or any time thereafter when the patient is first seen. Prior to the start of prophylaxis, beta hemolytic streptococci should be eradicated by proper treatment of the patient (see methods of penicillin therapy recommended above).

NOTE: In patients receiving ACTH or cortisone, be cautious that other infections are not masked since the prophylactic dose is inadequate to treat such concurrent illnesses as pneumonia or meningitis.

How long should prophylaxis be continued?

In children, at least to the age of 18; in all those above this age, for at least 5 years from their last attack.

Should prophylaxis be continued during the summer?

Yes.

Prophylactic Methods

Sulfadiazine

This drug has the advantage of being easy to administer, inexpensive, and effective (other newer sulfonamides are probably equally effective). Although resistant streptococci have appeared during mass prophylaxis in the armed forces, this is rare in civilian populations.

Dosage: From 0.5 to 1.0 gm. taken each morning throughout the year. The smaller dose is to be used in children under 60 pounds.

Toxic reactions: These are infrequent and are usually minor. However, in any patient being given prophylaxis with sulfonamides, consider all rashes and sore throats as possible toxic reactions to the drug, especially if they occur in the first 8 weeks of prophylaxis. The chief toxic reactions are:

1. Skin eruptions: (*a*) Morbilliform, much like measles—continue drug with caution. (*b*) Urticarial—best discontinue treatment. (*c*) Scarlatiniform—often associated with sore throat and fever; unsafe to continue drug.

2. Blood reactions: Leukopenia—Discontinue if white blood count falls below 4,000 and polynuclear neutrophiles below 35 percent because of possible agranulocytosis which is often associated with sore throat and a rash. Because of these reactions, weekly white blood counts are advisable for the first 2 months of prophylaxis. (The use of sulfonamides *therapeutically* for any reason in this period should be preceded by a white blood count.) The occurrence of agranulocytosis after 8 weeks of continuous prophylaxis with sulfonamides is extremely rare.

Penicillin

Although experience with oral penicillin for the prophylaxis of rheumatic fever is more limited than that with the sulfonamides, the antibiotic promises to be a safe and effective prophylactic agent. Oral penicillin has the desirable characteristics of being bactericidal for hemolytic streptococci and of rarely producing serious toxic reactions. It has the disadvantages of being more costly than sulfadiazine and, because of the need to give it on an empty

stomach, of being somewhat more difficult to administer.

Oral penicillin represents an alternative drug for rheumatic fever prophylaxis. It is especially important to use this agent for those who do not tolerate sulfadiazine.

Dosage: Although other routines of administration may prove satisfactory, the following schedules are suggested: 200,000 to 250,000 units two times daily is recommended. Since penicillin is best absorbed on an empty stomach, the time of administration should be ½ to 1 hour before a meal or at bedtime. A single dose of 200,000 to 250,000 units before breakfast is less preferable.

Toxic reactions: (1) Urticaria. (2) Reactions similar to serum sickness—they include fever and joint pains and may be mistaken for rheumatic fever. (3) Angioneurotic edema. Although many individuals who have had reactions to penicillin can subsequently take the drug without trouble, it is safer not to use penicillin, if the reaction has been severe and particularly if angioneurotic edema has occurred.

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Epidemiology Course for Nurses

The Public Health Service Communicable Disease Center has announced a course in epidemiology for public health nursing personnel to be given April 27–May 15, 1953, at 441 West Peachtree Street, Atlanta, Ga.; field experience will be available to a limited number, May 18–June 26, 1953, at Jackson, Miss., or Montgomery, Ala. Those eligible to take the course include: communicable disease nursing consultants, public health nursing supervisors, and staff nurses, educational directors, coordinators, and nursing instructors.

The tuition-free course is designed to give the trainee a broader understanding of present-day communicable disease problems and their control, with emphasis upon the principles of epidemiology, the rationale of the collection of laboratory specimens, and the interpretation of laboratory reports; the field experience will give practice in applying these principles.

Applications should be sent by April 1, 1953, to the Chief Nursing Consultant, 50 Seventh Street NE., Atlanta, Ga.