Syphilis and Serologic Evaluation of Patients

A Recurring Problem

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The number of persons with syphilis has been rising steadily in the United States since 1956. A recent editorial in the New England Journal of Medicine pointed out that within the last two years infectious primary and secondary syphilis has risen 87 per cent, that approximately 60,000 new cases of syphilis are reported each year in this country and that currently about 1,200,000 persons have syphilis and need treatment.

In California, 570 new cases of primary and secondary syphilis were reported in 1958; in 1959 there were 935 new cases and in 1960 approximately 1500. More than 280 deaths in which syphilis was a cause were reported in California in 1959. The present rate of syphilis in California is at its highest since 1949. In San Francisco there were 885 cases of syphilis (all stages) reported in 1959, and the number was even greater in 1960. Among communicable diseases, only measles, mumps, streptococcus infections and gonorrhea are more common in California.

In recent years, syphilis has come to be regarded as a minor disease problem to which little thought and care need be given because it has been largely eliminated. The requirement of a routine serologic test for syphilis of all patients at the time of admission to hospital has been eliminated. Many clinicians have stopped even selective serologic testing for syphilis on their patients. Reasons frequently given for not routinely examining for syphilis infection are that the disease is most common in young persons and is not common in the white population. However, data for San Francisco indicate that three-fourths of the primary new cases are in white patients. As to the age of patients, in San Francisco in 1959 there were no cases of primary syphilis reported in patients under 20 years of age, 24 cases in the 20 to 24 age bracket, 111 cases in persons from 25 to 34 years old, 35 cases in the 35 to 44 age group and two cases in persons of 45 and over.

In the last 11 years, many new tests have been developed using virulent Treponema pallidum, their variants, extracts or portions as the antigen. Many pathologists, clinicians and nonmedical laboratory workers regard the Treponema pallidum Immobilization Test (TPI) and its related tests as the ultimate for diagnosis of syphilis. Some have even advocated that no diagnosis of syphilis be made unless the TPI or similar test is performed. However, the very number of Treponema pallidum tests and their variations that have developed in the past 11 years indicates that the tests must not be as perfect as many believe. These new tests include over 13 with Treponema pallidum as the antigen, seven or more with Reiter Treponemal antigen, and many more non-Treponemal antigen tests. Among these tests are:

1. Treponema pallidum Immobilization Test
2. Treponema pallidum Methylene Blue Test
3. Treponema Agglutination Test
4. Treponema pallidum Immune Adherence
5. Full-Bodied Treponema pallidum Complement Fixation Test
6. Fluorescent Treponemal Antibody Test
7. Treponema pallidum Complement Fixation
8. Treponemal Wassermann Reaction
9. Treponemal pallidum Cryolysis Protein Reaction
10. Reiter Protein Complement Fixation
11. Kolmer Test with Reiter Protein Antigen.

The terms specificity and sensitivity are used for evaluating serologic tests. Sensitivity refers to the percentage of reactive and weakly reactive results obtained with sera from known syphilitic donors, while specificity refers to the percentage of negative or nonreactive results obtained from sera of non-syphilitic donors.

The Serology Evaluation Research Assembly Study (SERA) showed that the sensitivity of the TPI and related treponemal tests varied from 65.48 per
cent to 91.63 per cent, while the specificity of the same tests varied from 80.98 per cent to 97.30 per cent. An analysis of these data points out the fallacy of arbitrarily accepting the TPI as having absolute sensitivity and specificity. In the same studies the tests employing the Reiter antigen showed a sensitivity which varied from 72.29 per cent to 95.06 per cent, while the specificity varied from 86.29 per cent to 97.77 per cent. Magath, in summarizing his views on the sera Report, said, "If there is one over-all conclusion that may be drawn from the work of the Assembly, it is that the best treponemal antigen tests are no better than the best standard serologic tests, taken as a group."

If the treponemal test is positive, it indicates a high probability that the patient does have or has had syphilis; but if it is negative, it will neither confirm nor deny the results of the Serologic Tests for Syphilis (STS). Similarly, if the STS is negative or nonreactive and the treponemal test is positive, this fact alone does not establish an absolute diagnosis of syphilis. The results of the Reiter tests should be interpreted in a similar manner.

During recent months we have evaluated a selected group of patients using the Reiter, Kolmer, VDRL and Hinton tests. Fifteen of these patients had definite evidence of syphilis other than from serologic tests. The majority of this group were in tertiary stages, and many had been adequately treated. Results of the tests as follows: the Reiter test was reactive in seven cases, the Kolmer in five cases, the VDRL in 13 cases, and the Hinton in all 15 cases. These results emphasize the usefulness of tests such as the VDRL and Hinton for general screening and also point out that both the Reiter and Kolmer may be negative or may become negative in patients who have had syphilis.

The study also included another four patients who on the basis of age, past history, physical examination and clinical evaluation were believed to be "false positive" reactors. Results of their tests were as follows: the Reiter was negative in all four cases, the Kolmer was reactive in three, the VDRL was reactive in three and the Hinton in two. One of the four patients had known collagen disease, another showed a nonreactive TPI, and in the other two patients there was no apparent reason to account for the results obtained with other tests.

This study, although small, again emphasizes the usefulness of the Reiter test. When this test is reactive, the probability that the patient has or has had syphilis is high; and when it is negative, it is of no absolute diagnostic significance.

**REFERENCES**


8. San Francisco Department of Public Health: Personal communication to the author.
