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CURRENT STATUS OF THE SEROLOGY OF SYPHILIS

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R. Pautrizel

The problem of syphilis has been considerably confused for the past 20 years or so as a result of the discovery of the treponemicidal properties of penicillin on the one hand, and of the major advances made in the field of the immunology of syphilis and particularly in seroimmunology, on the other hand.

In effect, after the discoveries of Mary Pangborn relating to the cardiolipids and the elaboration of the Treponema immobilization test by Nelson in 1950, it was necessary to accept the immunological basis of the serology of syphilis. There is no longer any question of doubting that this disease is accompanied by immunological manifestations. The use of appropriately balanced serological tests has made it possible, in addition, to make a much more rational interpretation of a number of highly controversial pathological facts.

CLASSICAL SEROLOGY

Until Nelson's discovery, all the serological tests - and there are very many of them - consisted in bringing to light, by means of different properties (hemolysis reaction or flocculation reaction), a substance which existed in the syphilitic serum and which had been called syphilitic reagin. Today it is well known that this substance is an antibody. At the present time we can use serological techniques based on these same properties: complement fixation (hemolysis reaction), flocculation or microagglutination. The results obtained with these new tests (Kline's reaction, VDRL reaction,

Kolmer's reaction, etc.) are more specific and more sensitive because they take the immunological laws into account and because the antigenic reagents used are prepared from the cardiolipids.

Tests for the Detection of the Group Antitreponemal Antibodies

Apart from the syphilitic reagin, the organism manufactures also other antibodies, and certain Austrian and Italian authors have shown possible interest in carrying out serological tests using, as antigenic material, certain suspensions of cultivated Treponema (Reiter's strain). Here, too, numerous improvements have been brought about in the technique, and this diagnostic method is now a much more certain one, thanks to the more sensitive and better standardized preparations extracted from cultivated Treponema which this method employs.

The immobilization test. - Since Nelson's discovery this test has been used, on a rather large scale, for the detection of immobilisin, an antibody different from reagin. However, this antibody is manufactured by the patient much later than the syphilitic reagin or the group treponemal antibodies.

The immunofluorescence test. - In the area of syphilis, the phenomenon of immunofluorescence has been used, which makes it possible to considerably increase the sensitivity of the detection of the antibodies. Unfortunately, this serological method has not yet been used here on a sufficiently large scale to enable us to really form an opinion of the relative value of the results furnished by this method compared with the other serological tests.

Hence we can see now that for the biological diagnosis of syphilis the biologist may have techniques available which consist in detecting in the serum a very large number of antibodies which considerably increase the specificity of the diagnosis of this disease. Since all these antibodies do not appear at the same time, it is possible in certain cases that the results will be dissociated. It is then necessary to interpret them as a function of the known data of the development of these different antibodies during the disease or after its treatment.

Use of the serological tests for the surveillance of the patient after treatment. - The development of the antibodies during the syphilitic illness does not take place at a special rate: It was possible to verify that, when the syphilitic organism is freed from its *Treponema* by an efficacious therapy - such as a well-managed penicillin therapy - a decrease in antibody production is observed. Hence it will then be necessary to follow this production with the aid of quantitative tests. One may, for example, have recourse to techniques permitting the determination of the syphilitic reagin. One may also determine the antitreponemal antibodies detected with Reiter's antigen. At any rate it is important to make use of highly simple and easily reproducible techniques, and it is for this reason that in actual practice the immobilization test is little used for following the quantitative development of immobilisin.

The systematic use of this quantitative serology has made it possible to observe that the decrease of the production of antibody after the sterilization of the patient takes place more rapidly if the patient had received an early treatment; in other words in the case of primary syphilis the curve of syphilitic reagin drops in a very intense manner, arriving at the negativation period already after a few months. In the case of a secondary syphilis it is necessary to wait much longer, sometimes more than a year, until this negativation phase is attained. In the case of tertiary syphilis the waiting time is even longer. One should also keep in mind the fact that the development of the different antibodies takes place in a parallel but not superimposable manner, and that after the treatment it is possible that the serological results will be dissociated, with some of the antibodies disappearing before the others. One should also remember that during the development of the disease there is produced a modification of the antibodies that is not only quantitative but qualitative as well, and that as the syphilis becomes older its antibodies become less avid and, in this case, they become particularly sensitive to the zone phenomenon. Hence in operations aiming at the tracking down of the disease it is necessary to resort to diagnostic techniques that are little sensitive to the zone phenomenon.

Again, it is quantitative serology which informs us, in the case of a child with a positive serology at birth, whether or not he is syphilitic. It is by following the fate of his antibodies by means of quantitative tests that the two cases can be distinguished from each other.

Furthermore, quantitative serology enables us to understand and compare the behavior of the antibodies in the blood and in the cephalorachidian fluid in the course of a syphilis of the nervous system.

Two points
Hence it can be said that the improvements brought about during the last few years in the area of the serology of syphilis have made it possible to completely reformulate certain old conceptions of this disease and, thanks to this achievement, the physician will be able to evaluate the efficacy of the treatment which he has set in action. ()