

THE WASSERMANN REACTION IN HEREDITARY SYPHILIS, IN CONGENITAL DEFORMITIES AND IN VARIOUS OTHER CONDITIONS IN INFANCY

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There is probably no modern means of diagnosis of greater importance than the Wassermann reaction. This not only enables one to be certain of the existence of syphilis in many doubtful conditions, but also to exclude syphilis in many cases where formerly it was suspected. It is the consensus of opinion at present that latent as well as active syphilis gives a positive response to this test. It is also the general belief that children who react positively should receive the benefit of antisyphilitic treatment.

Like all laboratory reactions, the Wassermann test is not infallible. Positive reactions may be obtained in certain cases of scarlet fever and in infection with trypanosomes; but neither of these conditions is very likely to be confused with syphilis. Negative reactions may be met with in syphilitic cases as a result of treatment, whether by mercury or salvarsan, and occasionally in other cases for unexplained reasons. With proper technic the errors are chiefly on the negative side, but they are not numerous. Errors due to faulty technic must also be taken into account. These are much more common and are almost always on the positive side, so that the children tested are pronounced syphilitic when they are not so. It is absolutely essential that reagents used should be right; that the antigen be good and well tested; and that sheep or human corpuscles be fresh, preferably less than twenty-four hours old, and properly washed. A mistake in technic is the probable explanation of the large percentage of positive reactions obtained in children by some writers. One person with such an experience has, indeed, recently written to me raising the question whether the Wassermann test can be relied on in infants. It had been used on those who were to be placed out for adoption and the number of positive reactions obtained was most disturbing. Under such circumstances doubt should be cast on the manner in which the test was made, rather than on the value of the test itself.

It was to answer the question as to the frequency of active or latent syphilis in the ordinary run of hospital infants as well as in some special

conditions, particularly congenital deformities, that a series of observations has been carried on in the Babies' Hospital during the past year and a half.

The Noguchi modification of the Wassermann test has been employed in all of our patients. This has the great advantage, in the case of infants, of requiring much less blood (only $\frac{1}{2}$ of a c.c.) than the Wassermann test. All of these tests, with the exception of those in the last group of seventeen children examined, have been made at the Rockefeller Institute by one of Dr. Noguchi's assistants and under his supervision. I think we may, therefore, be certain as to the reliability of the technic and the accuracy of the observations.

During the period mentioned, 34 cases of hereditary syphilis were admitted for treatment. In 31 of these, blood tests were made, and 30 gave a positive reaction. The single case not responding was in an infant 5 months old, in whom there was a typical history of syphilis, but the child had been treated regularly with inunctions of mercury for a period of three months before.

Previous treatment with mercury does not seem to affect the reaction unless it has been continued for a considerable time and with regularity. For of the 30 patients giving positive reactions, 9 had been treated with mercury as follows: One an infant 6 months old, for two weeks; two sisters of $4\frac{1}{2}$ and 22 months, irregular treatment with inunctions since birth; one infant of 6 weeks, inunctions since it was 4 days old; one child of $2\frac{1}{2}$ years, inunctions irregularly from birth; one infant of 7 months, inunctions and mercury internally for one week; one infant of 21 months, irregular inunctions and potassium iodid almost from birth; one child of $2\frac{1}{2}$ years, irregular inunctions from birth. If we adopt the ordinarily accepted view that a positive Wassermann reaction is an indication that the patient is not cured and still requires treatment, it will be evident from the cases just cited how incomplete and how uncertain is the cure of syphilis effected by mercury and potassium iodid.

Of children who were not regarded clinically as syphilitic, 178 were studied. While this number is not large, it should be remembered that these cases were selected from about 1,800 hospital admissions, and that they include, in the first place, nearly every child in whom even a slight suspicion of syphilis existed. Besides, a considerable number of infants suffering from marasmus or malnutrition without selection were examined, all cases with congenital malformations, and a miscellaneous group of various acute and chronic diseases also unselected. Of the 178 tested, 167 gave negative reactions, and 11 positive reactions. The ages of the children were as follows:

	Positive	Negative	Total
Under 6 months.....	5	85	90
6 to 12 months.....	2	33	35
1 to 2 years.....	3	33	36
Over 2 years.....	1	16	17

Positive Cases.—Of eleven children showing no definite clinical evidence of syphilis, but giving a positive reaction, five died and came to autopsy. Four of these showed perisplenitis and perihepatitis of sufficient degree to warrant a pathological diagnosis of syphilis. Three of these were marasmus infants. In one of them there could be discovered no family history suggesting syphilis; in one the mother had had three previous miscarriages; in a third there was one previous miscarriage, but otherwise a negative family history; in a fourth, a child dying of acute gastro-intestinal intoxication, the parents gave a definite history of syphilis, and the child had general glandular enlargements. In only one case giving a positive reaction which came to autopsy, did the family history, the examination of the patient, or post mortem findings give no suggestion of syphilis.

Of the six positive cases which terminated in recovery, two were in rachitic infants with moderate enlargement of the liver and spleen; one was a child with spastic diplegia, whose mother gave a positive reaction; one was a case of sclerema, with moderate enlargement of liver and spleen, but with a negative family history; one was a cretin with a negative family history, and one, a child admitted for convulsions of unknown origin. The positive reaction in the infant last mentioned led to tests of both parents, but neither responded. There was nothing in this patient's symptoms to suggest syphilis.

We have, therefore, in this group of eleven cases, only three in which no evidence of syphilis could be found, either in the family history, the clinical symptoms or the pathological findings. In the remaining eight positive cases, the evidence of syphilis was practically conclusive in five; in the other three cases, rickets and enlarged liver and spleen were present.

Negative Cases.—One hundred sixty-seven children gave a negative reaction. In this group, twelve came to autopsy and in none of them were any lesions present suggestive of syphilis. The largest single group were fifty-six infants with malformations or congenital deformities. Inasmuch as syphilis has been thought to be an etiological factor in certain of these conditions they were made a subject of special study. These cases were as follows:

Spina-bifida	10	Defective cerebral development...	6
Mongolian idiocy	8	Cystic kidney	1
Spastic diplegia	6	Hygroma of the neck.....	1

Congenital cardiac disease.....	6	Congenital obliteration of the	
Hare-lip and cleft palate.....	5	bile ducts	1
Hydrocephalus	5	Amaurotic family idiocy.....	1
Exstrophy of the bladder.....	1	Clubfeet and hands.....	1
Microcephalus	4		
		Total	56

The remaining cases were divided as follows:

Marasmus and malnutrition.....	57	Rachitis	3
Acute pneumonia.....	16	Tumor of the brain.....	2
Empyema	5	Chorea	2
Tuberculosis	7	Duodenal ulcer	3

And one each of the following conditions: Pemphigus neonatorum, meningeal hemorrhage, scurvy, leukemia, diabetes, encephalitis, poliomyelitis, papilloma of the larynx, chronic nephritis, eczema, basilar meningitis, acute arthritis, hernia, convulsions, ulcerative stomatitis, hydrocephalus. Total, 111.

From these observations it would appear that syphilis does not play an important part in the production of the common congenital deformities, since in not a single one of fifty-six consecutive cases studied was a positive reaction found. Again, it has been assumed that syphilis was exceedingly common in the marasmus type of infant admitted to a hospital. I remember many years ago while visiting the marasmus wards of the Blockley Hospital in Philadelphia, asking of the attending physician, who was showing me through the institution, what he did for this class of patients. "We give them all mercury and the iodids; they are all syphilitic," was his reply.

The presence in marasmus patients of enlargement of the liver and spleen and superficial lymph-nodes is not sufficient to warrant the diagnosis of probable syphilis. This is so often assumed that we have made the size of the spleen and liver a subject of special study in all patients examined. In the 167 negative cases the liver was much enlarged in 12 and palpable in 39 others. In the patients showing much enlargement of the spleen, the liver was almost invariably enlarged also, 7 of the cases showing much hepatic enlargement, and 8 of those showing splenic enlargement were rachitic.

There was general enlargement of the superficial lymph-nodes, sufficient to be noted, in fifty-two cases, or 33 per cent., and in twenty of these the swelling was considerable. It is evident, then, that mere swelling of the liver and spleen even when associated is not to be regarded as a very important sign suggestive of syphilis in infants suffering from malnutrition. Both are much more likely to be seen with rickets than with syphilis. Moreover, general swelling of the superficial lymph-nodes, whether occurring alone or with swelling of the liver and spleen, has no special significance. The only glandular swellings that do suggest syphilis are those of the epitrochlears when they occur without any peripheral lesion to explain it.

CONCLUSIONS

Cases of hereditary syphilis almost invariably respond positively to the Wassermann test, even when previously treated by mercury, unless the treatment has been very thorough and protracted.

After the use of salvarsan it has been my experience that it disappears much more regularly and earlier, but even then in most cases only after repeated injections.

Of 178 tests made in hospital patients showing no definite signs of syphilis, positive reactions were obtained in but eleven and five of these were shown on fuller investigation or subsequent findings to be pretty clearly syphilitic. Two of the remaining six were doubtfully so.

The great portion of congenital deformities have no relation to syphilis, since not a single positive reaction was obtained in fifty-six consecutive cases.

Of sixty-two patients suffering from malnutrition or marasmus, only five gave a positive reaction, and are included in the group above mentioned. Of the remaining fifty-seven, nearly one-third had very considerable enlargement of the spleen or liver, or both. Since the cases examined were selected from a much larger number, as those most likely to be syphilitic, we cannot regard syphilis as a common cause of marasmus, certainly in the patients admitted to the Babies' Hospital. Since the error, when one exists, is almost invariably on the positive side, the technic of those who find a very large proportion of positive reactions among marasmus patients in institutions is open to suspicion.

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