

# THE EFFECT OF MERCURY SALICYLATE ON THE WASSERMANN REACTION

OBSERVATIONS ON THE SEROLOGY OF EIGHTY-SEVEN PREVIOUSLY  
UNTREATED MEN

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I have recently had the opportunity of treating a number of syphilitic patients solely by the intramuscular injections of mercury salicylate. The paucity of reports of the effect of this drug alone on the Wassermann reaction is deemed sufficient reason for the publication of this study.

## TREATMENT OF SOLDIERS WITH MERCURY SALICYLATE

The eighty-seven patients were men in the military service who had no active manifestations of syphilis. They had all passed the clinical examination of the draft board and that of the enlisting officers. Some of the patients were selected by the routine serologic examination of cooks and bakers, and candidates for these positions.<sup>1</sup> Thirteen of the patients denied having had syphilis. Twelve of these gave a 4 plus Wassermann reaction on more than one examination; the other presented a scar on the penis and scars of bilateral suppurative adenitis. One of the patients was an hereditary syphilitic.

No case in which the patient received arsphenamin previously or concomitantly with the mercury injections is reported in this paper, nor cases in which patients had received previous systemic anti-syphilitic treatment as civilians. I am, therefore, unable to report the action of mercury salicylate on the Wassermann reaction in active syphilis. I did not feel justified in withholding from patients with active manifestations of syphilis the chemotherapeutic drug arsphenamin.

The serology was performed at the laboratory of the Institute of Tropical Medicine and Hygiene, San Juan, P. R. The only information the laboratory received was the infirmary number of the patient. The tests were made in duplicate. A clinical control, known positive, was always sent in, and the laboratory had no means of identifying this control. Not infrequently, and with the knowledge of the laboratory director that it was being done, two tests of the same patient,

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1. Goodman, H.: Genital Defects and Venereal Diseases Among the Porto Rican Draft Troops, J. A. M. A. **72**:907 (March 29) 1919.

taken at the same time, were put through on the same day, one test by name and the other by number. This ruse, as it might be called, was an impetus to the clerical and technical force which assured me that few, if any, errors of disinterest would occur. In all I was able to correlate the serologic and clinical findings in over 2,500 patients, and I am assured that the tests are trustworthy and do not hesitate to base conclusions on them.

#### METHOD OF PROCEDURE

The patients who were given the mercury salicylate treatment had the Wassermann reaction performed at the first visit. Subsequently, for six or eight weeks, they received 1 grain of mercury salicylate in liquid petrolatum. The 10 per cent. suspension was prepared by my pharmacist under the most strict aseptic precautions. The site of injection was the region of the buttock, alternating from one side to the other. Extra long needles were used, sharpened and sterilized after each injection. The Luer all-glass syringe was employed. The dose was not increased progressively. After a course, another Wassermann test was taken, and then a rest of four weeks with freedom from treatment was given. I had planned to have another Wassermann test made before resuming treatment, but few of the patients reported received this test as the demobilization intervened.

#### RESULTS

Forty-seven patients showed no change from 4 plus or 3 plus positive reactions after the first course of mercury salicylate. In five patients the Wassermann advanced from 3 plus to 4 plus. In seven patients the reaction was reduced from 4 plus to 3 plus. There were in all fifty-eight patients, or 66 per cent. with minor or no change from very strongly and strongly positive reactions. In one patient there was a reduction from 3 plus to 2 plus. In five cases there was recorded a diminution from 4 plus to 2 plus. In four other cases there was a change from 4 plus to doubtful.

In eight patients, or 9 per cent. of the total, there was a reversal of the Wassermann reaction from 4 plus to negative. In four others the negative Wassermann did not persist, and a 4 plus Wassermann reaction was obtained after the rest period. In one instance the Wassermann 4 plus prior to and at the end of the first course of mercury salicylate was negative at the expiration of the rest period.

The table contains data on twenty-nine cases. Those with no change in reaction have been omitted.

## MERCURY SALICYLATE AND THE WASSERMANN REACTION \*

Number	Case	Infected	First Wassermann Test	Number Mercury Salicylate	Second Wassermann Test	Wassermann Test after Rest
1	467	1912	+++	6	++	
2	632	Cook	++++	9	++	
3	636	1918	++++	8	++	
4	395	1916	++++	8	++	
5	469	1916	++++	8	++	
6	910	1918	++++	8	++	
7	746	1916	++++	9	++	
8	738	1918	++++	6	±	
9	1289	Denied	++++	6	±	
10	1164	1911	++++	6	±	
11	1056	Baker	++++	9	—	
12	1009	Baker	++++	7	—	
13	1272	1916	++++	5	—	
14	77	1916	++++	8	—	
14	Continued	....	.....	8	—	
15	388	1908	++++	6	—	—
16	140	1912	++++	7	—	
17	615	Cook	++++	8	—	
18	102	1918	++++	8	—	
19	263	1910	++++	8	—	
20	187	Denied	++++	6	—	++++
21	392	1913	++++	11	—	++++
22	205	1915	++++	8	—	++++
23	181	1910	++++	8	—	
23	Continued	....	.....	8	++++	
24	653	1911	++++	6	±	
24	Continued	....	.....	4	++++	
25	186	1918	++++	8	—	++
26	502	1913	++++	8	++	
26	Continued	....	.....	4	—	
27	335	1909	++++	8	++	
27	Continued	....	.....	5	±	
28	91	1909	++++	7	++++	
28	Continued	....	.....	6	—	
29	250	1913	++++	8	++++	—

\* My copy of the history of cooks and bakers does not contain any notes concerning date of infection.

LITERATURE ON TREATMENT OF SYPHILIS WITH  
MERCURY SALICYLATE

Although the literature is replete with articles on the use of mercury salicylate in the treatment of syphilis, they are for the most part from the pre-Wassermann period. Many, since the introduction of the reaction, deal with the technic of the intramuscular injection, and methods of rendering it less painful or even painless. Nelson and Anderson,<sup>2</sup> however, reported in 1915 on the use of mercury salicylate in syphilis. The Wassermann tests were made by Craig, and the results were 2 plus, plus, doubtful and negative. The patients in a military prison had not received any previous therapy. There were forty-three latent and seven secondary cases of syphilis. The dose of mercury salicylate was 1½ grains once a week in the beginning, then once in fourteen days, and later irregularly. No patient was salivated; they were all kept at work; few complained of sore buttocks, and there

2. Nelson, K., and Anderson, E. A.: The Use of Mercury Salicylate in Syphilis, with a Record of Its Influence on the Wassermann Reaction in Fifty Cases, J. A. M. A. **65**:1905 (Nov. 27) 1915.

was no objection on the part of the men to the form of therapy. Of the action of mercury salicylate, these authors are of the opinion that: "In the light of our experience it seems improbable that the salicylate alone and unaided possesses any real curative value in this disease.

. . . Serum reactions have in some cases varied from double plus to plus minus or minus, and later returned to the double plus while the treatment was in progress. It is our opinion that these variations in the serum reaction are due to other causes than the treatment.

. . . It is certainly fair to believe that mercury salicylate used hypodermically in full doses over many weeks of time has little if any real influence on the disease."

These authors give a table of their fifty cases with the Wassermann reaction reported for each month the men were under treatment. The number of injections vary between twelve and twenty; the number of Wassermann reactions varies between six and eight. Two patients gave "two and three negative serum reactions. In both cases the men obtained clemency and were discharged from the prison at this period of treatment and we were unable to follow them further. It is our belief that a continued record on these two cases would undoubtedly have shown a positive reaction later in the treatment. Had they failed to do so they would have been the first to record this, for just this thing did occur in ten cases. This also clearly establishes the value of more than one serum reaction and the error that would arise from the acceptance of a single negative result as final."

Best<sup>3</sup> gave larger doses than Nelson and Anderson, and at weekly intervals. He writes, "the intramuscular injection of mercury salicylate offers the most convenient, most easily controlled, most efficient, and most satisfactory of any of the various forms of mercury treatment." The ten cases he cites do not, however, compare with those of Nelson and Anderson or those recorded in this paper, because seven of the patients had received previous arsphenamin therapy, and all had taken iodids.

Haller<sup>4</sup> reported a group of twenty-five patients in various stages and of various age of infection with 4 plus Wassermann reactions who were treated with mercury until the Wassermann reaction became negative. Treatment was discontinued until the reaction again became positive (4 plus). The average length of time until this occurred was about one month. The extreme case on the one hand was ten days, on the other hand four months. The more active the case, the

3. Best: Intramuscular Injection of Mercury Salicylate in the Treatment of Syphilis, *Med. Rec.* **89**:473, 1916.

4. Haller, David: Variations in the Strength of Positive Wassermann Reactions in Cases of Untreated Syphilis, *J. A. M. A.* **66**:882, 1916.

more readily the reaction returned 4 plus, as one would naturally expect. The age of the infection seemed to make little difference in the rapidity of the return to positive. Variations from month to month in the degree of positiveness of serum of untreated syphilitic patients varied slightly.

Fordyce, Swift, Craig and others have for many years taught that the negative Wassermann reaction during or after treatment is of no convincing value of cure unless it remains negative for at least two years, with no development of symptoms, no suggestion of positiveness in the reaction frequently repeated during the period of observation, and of course the negative and assuring clinical, neurologic, and serobiologic examination of the nervous system and the spinal fluid. With the first of these as a criterion, it appears that mercury salicylate alone and in the doses given has shown little evidence, from my own short period of observation on this series, or the longer period of observation of Nelson and Anderson, as qualifying as a curative agent in latent syphilis.

Should a similar opportunity present itself again, I shall give mercury salicylate intramuscularly in increasing doses from 2 to 2½ grains each week, if the patients give no evidence of mercurialism.

#### SUMMARY

Eighty-seven previously untreated latent syphilitic patients with 4 plus Wassermann reactions were given 1 grain of mercury salicylate intramuscularly at weekly intervals for courses of from six to eight injections. The Wassermann reaction immediately after treatment remained strongly positive in 66 per cent. of the cases. In only 9 per cent. was there a reversal to negative; and in some such patients who were given a third Wassermann test after an interval without treatment, the reaction was positive. It seems fair to conclude with Nelson and Anderson, who carried on a similar study in 1915, that mercury salicylate alone in the dosage and for the period given does not qualify as a curative agent in syphilis. The plans for a longer study were curtailed by the demobilization. In the future, mercury salicylate will be used in increasing doses up to 2 and 2½ grains weekly in an effort to learn whether mercury salicylate in larger doses is effective.

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