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THE WASSERMANN REACTION (NOGUCHI MODIFICATION) IN PELLAGRA.

*Report of Thirty Cases.**

By Howard Fox, M. D.,
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In a recent communication (*Journal of the American Medical Association*, 1909, p. 1187) Dr. C. C. Bass, of Tulane University, reports that he has obtained six positive Wassermann reactions in six cases of pellagra, using lecithin as antigen. He suggests that these results if confirmed may "tend to strengthen the idea that the disease is of protozoan origin." He further states that it would add another disease to be considered in interpreting a positive Wassermann reaction. It is with the purpose of continuing these researches that the writer has come to the State where so many cases of pellagra have been recognized. Owing to the kindness of Dr. J. W. Babcock and Surgeon-General Wyman, free access to a most unusual material has been obtained.

Thirty cases of pellagra have been tested by the Noguchi modification of the Wassermann reaction. The writer would have preferred, as has been his custom, to have performed both the regular Wassermann and Noguchi tests simultaneously. Owing to the limited amount of time available, it was only possible to employ the more convenient modification of Noguchi. The writer feels convinced, however, that the Noguchi test is fully as accurate as the original method of Wassermann.

*Read before the National Conference on Pellagra, held at Columbia, S. C., November 3, 1909.

The cases examined included eight white and twenty colored women, one white man and one colored boy. All of the patients were from South Carolina, and with the exception of Case 1, were inmates of the State Hospital for the Insane at Columbia. All of the patients with perhaps one exception have shown unmistakable symptoms of pellagra, though at the time of examination some did not present very active symptoms of the disease. The patients who were chosen for examination were those which apparently showed no evidence of syphilis. To have excluded syphilis from the patients' history would have been difficult or impossible from the nature of the cases.

The technique was that described by Noguchi and by the writer in previous communications (*Medical Record,* March 13, 1909, and *Journal of Cutaneous Diseases*, August, 1909). The materials used included 0.04 c.c. of fresh guinea pig serum, a weak suspension of human corpuscles (preferably washed) in the proportion of one drop to 4 c.c of physiological salt solution, one capillary drop of patient's serum (active) and the antigen and amboceptor in paper form. The tubes were incubated for one half hour for the first, and two hours for the second period, after which the results were read. Two different antigens were used in testing every case. One of these consisted of an extract of syphilitic liver; the other (especially prepared by Dr. Noguchi for the present investigation) was a composite extract of syphilitic liver and normal hearts and kidneys. Both had previously been tested by Dr. Noguchi and found to be entirely satisfactory.

In performing the reaction, a known negative serum and one or more known positive sera were always used for comparison. The positive sera included five cases of syphilis and two of leprosy

which the writer had previously tested and found to be strongly positive. The entire series of thirty cases was tested four times. With the exception of one case, no strongly marked positive reactions were obtained. In this case it was later found that a previous syphilitic infection was quite probable. In two other cases there was a positive reaction of moderate intensity and in five cases the reaction was only weakly positive. Even in the cases giving a moderate positive reaction the inhibition of hæmolysis was far from being complete and was very easy to distinguish from the marked reaction given by the syphilitic and leprous sera.

While positive reactions are at times given in apparently nonsyphilitic cases, there appears to be only one disease, namely, leprosy, in which a strong positive reaction is a frequent occurrence. In an examination of fifteen cases of leprosy during the past few months in New York the writer found twelve positive reactions, many of them being very intense. Somewhat similar results have previously been obtained by other observers. The writer feels confident that pellagra will not prove to be a disease in which a positive Wassermann reaction will be frequently found. If such a sensitive test as that of Noguchi (and the objection is sometimes made that it is too sensitive) fails to show many positive reactions, it does not seem probable that they will be obtained by the regular Wassermann method.

The writer desires to express his heartfelt thanks to Dr. J. W. Babcock, superintendent of the State Hospital for the Insane, and to Dr. Walter Wyman, surgeon general, United States Public Health and Marine Hospital Service, for permission to examine the cases. He is also indebted for laboratory facilities to Dr. C. F. Williams, secretary of the State Board of Health, and Dr. F. A. Coward, director of

the Laboratory. For Case 1, the writer wishes to thank Dr. J. J. Watson, of Columbia.

CASES.

Case I.—C. S., boy, colored, twelve years old; not insane; symptoms of pellagra first noticed five years ago. At present there is an extensive eruption of face, neck, and back of hands, wrists, elbows, and legs. There was constant salivation, distressing thirst, red tongue, severe uncontrollable diarrhœa, spastic gait, greatly increased reflexes, unequal pupils. There were frequent tonic, muscular spasms drawing the body to the left side. Patient was greatly emaciated. Mental condition was not markedly affected. Reaction, weakly positive.

Case II.—H. M., woman, colored, about fifty years old; manic depressive insanity. First attack of pellagra four years ago. Fairly well till one month ago, when symptoms recurred. At present eruption on face and hands. Diarrhœa. Knee jerk absent. Reaction, negative.

Case III.—F. W., woman, colored, about twenty-eight years old; manic depressive insanity with pellagra. Symptoms of pellagra first noticed three weeks ago. At present red tongue, diarrhœa, erythema of backs of hands. Knee jerk increased. Reaction, negative.

Case IV.—H. J., woman, colored, about twenty-eight years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed ten months ago. At present characteristic eruption of hands, feet, and neck; salivation. Reaction, negative.

Case V.—M. H., woman, colored, about forty-five years old; epilepsy. First symptoms of pellagra developed six weeks ago. At present marked characteristic eruption of hands and neck, diarrhœa, exaggerated knee jerk. Reaction, moderately positive.

Case VI.—M. L., woman, colored, about fifty years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed six weeks ago. Characteristic eruption of hands and neck, diarrhœa. Knee jerk abolished. Reaction, negative.

Case VII.—M. H., woman, colored, about thirty-five years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed three weeks ago. At present characteristic eruption of hands and neck, diarrhœa, red tongue. Knee jerk abolished. Reaction, moderately positive.

CASE VIII.—L. L., woman, colored, eighteen years old; pellagrous insanity. Admitted with symptoms of pellagra three months ago. At present eruption of hands, elbows and legs. Had had attacks of rigidity of dorsal muscles in which she fell backward. Tongue rough, with elevated papillæ, diarrhœa. Knee jerk much exaggerated. Reaction, negative.

CASE IX.—M. P., woman, colored, about twenty-five years old; paresis with pellagra. First symptoms of pellagra six weeks ago, tongue slightly checker board. Knee jerk abolished. Reaction, weakly positive.

CASE X.—R. A., woman, colored, forty-three years old; pellagrous insanity suggesting alliance with paresis. Patient admitted one month ago with characteristic eruption on hands and feet, diarrhœa. Tongue fissured (checker board). Knee jerk abolished. Reaction, negative.

CASE XI.—J. B., woman, colored, about sixty years old; pellagrous insanity. First symptoms of pellagra one year ago. At present nearly well. Exaggerated knee jerk. Bronzing of exposed surfaces of hands. Reaction, negative.

CASE XII.—S. K., woman, colored, about twenty-five years old; pellagrous insanity. Admitted to hospital eight months ago. Hands bronzed, marked salivation. Knee jerk abolished. Reaction, negative.

CASE XIII.—M. W., woman, colored, about thirty years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed one month ago. Characteristic eruption on hands and neck. Reflexes exaggerated. Reaction, negative.

CASE XIV.—C. M. B., woman, colored, about forty years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed one month ago. Characteristic eruption on hands and neck. Reflexes exaggerated. Reaction, negative.

CASE XV.—H. C., woman, colored, thirty-five years old; pellagrous insanity. Admitted to hospital two months ago with symptoms of insanity. Tongue fissured and slimy. Nails slightly clubbed, elbows slightly pigmented. Knee jerks normal. Reaction, negative.

CASE XVI.—J. C., woman, colored, about forty-five years old; pellagrous insanity; melancholia one year ago. Eruption first noticed during past summer. At present typical eruption on hands and neck, pigmented tongue. Knee jerk abolished. Reaction, negative.

CASE XVII.—J. T., woman, colored, about thirty-five

years old; pellagrous insanity. First symptoms noticed one year ago. At present eruption on hands. Lips exfoliated. Knee jerk brisk. Reaction, negative.

Case XVIII.—L. M., woman, colored, twenty-eight years old; pellagrous insanity. History of attack one year ago. Present attack began one month ago. Eruption on face, hands, and feet. Severe diarrhœa, red tongue. Knee jerk slightly exaggerated. Confined to bed. Reaction, weakly positive.

Case XIX.—M. P., woman, colored, about fifty years old; clinical diagnosis of paresis on admission nine months ago. Symptoms of pellagra first noticed two months ago. At present eruption of hands and feet, broad slimy tongue. Some ptyalism. Diarrhœa. Confined to bed re-recently. Reaction, negative.

Case XX.—T. W., woman, colored, about thirty years old; manic depressive insanity with pellagra. First symptoms of pellagra noticed one year ago. Depression, diarrhœa, pigmented tongue. Knee jerk abolished. Reaction, negative.

Case XXI.—D. H., woman, colored, thirty years old, married; pellagrous insanity. History of attack one year ago. At present few symptoms. Reflexes exaggerated. Reaction, negative.

Case XXII.—L. B., woman, white, thirty-two years old, married; pellagrous insanity of manic depressive type. Had had a typical attack with eruption, stomatitis, and diarrhœa. Duration of disease two years. At present mental instability, erythema of back of hands. Reaction, weakly positive.

Case XXIII.—M. H., woman, white, twenty-eight years old, married; pellagrous insanity with suicidal tendency. Had had a typical attack of pellagra with predominance of mental symptoms. Disease associated with pregnancy. Duration less than one year. At present no eruption. Reaction, negative.

Case XXIV.—M. O., woman, white, thirty-six years old, single; pellagrous insanity. Had had a typical attack with marked anæmia. Repeated attacks of pellagra several times a year. Duration of pellagra about two years. At present diarrhœa, anæmia, erythema of backs of hands. Reaction, weakly positive.

Case XXV.—M. W., woman, white, about fifty years old, married; manic depressive insanity of long duration. Pellagra had developed within the last year and had run typical

course. At present marked diarrhœa, eruption, stomatitis, depression. Reaction, negative.

Case XXVI.—B. G., woman, white, thirty-five years old, married; pellagrous insanity. Duration of disease four months. At present marked emaciation, very slight eruption, anæmia, diarrhœa. Reaction, negative.

Case XXVII.—F. R., woman, white, thirty-six years old, single; pellagrous insanity. Duration one year. At present anæmia, depression, diarrhœa, eruption. Patient emaciated. Reaction, negative.

Case XXVIII.—L. B., woman, white, forty-five years old, single; moral imbecility with pellagra. Duration of pellagra two years. At present tongue swollen and indented by teeth. Stomatitis, diarrhœa, marked emaciation, eruption on back of hands. Reaction, negative.

Case XXIX.—M. B., woman, white, about forty years old, married; pellagrous insanity. Duration of disease six months. At present anæmia, diarrhœa, marked emaciation, very slight eruption on back of hands. Reaction, moderately positive.

Case XXX.—S. C. L., man, white, about thirty-five years old; pellagrous insanity. Duration of disease two years. At present delusions (suicidal), stomatitis, uncontrollable diarrhœa. Reaction, negative.

CONCLUSIONS.

1. Cases of pellagra do not often give a positive Wassermann reaction.

2. A positive reaction, when obtained, is generally weak and is easily distinguished from the strong reactions found in syphilis and in many cases of leprosy.

3. The value of the Wassermann test is not affected by the findings in pellagra.

Discussion by Dr. C. C. Bass, of New Orleans, La.: I wish to speak with reference to the paper of Dr. Fox, and to further emphasize the fact that his experiments with complement fixation in pellagra differ naturally from mine, in that he used as antigen extract of syphilitic liver and normal hearts and kidneys. Those do not yield a strong solution of lecithin.

My paper[1] referred only to results with lecithin as an-

[1]See *New York Medical Journal*, November 20, 1909, p. 1000.

tigen. When using the same sort of antigen as Dr. Fox, I got about the same results as Dr. Fox did. Complement fixation experiments that I have done, using many different antigens including various extracts from different organs and tissues from pellagrins as well as cultures isolated from patients and also from corn meal, have all been reserved for future reports and not considered worth while to include in the paper here read.

The only explanation so far suggested to me for the fact that lecithin serves better for antigen in pellagra than organ extract is that because of the destructive process in the nervous system a large amount of lecithin is set free and there may be formed in response to this increased lecithin content of the blood much antilecithin amboceptor.

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