

REMARKS UPON THE TREATMENT OF PARESIS

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On June 30, 1923, there were 920 cases of general paralysis of the insane enrolled in the various state hospitals of Illinois. Of the 4770 patients admitted during the year of 1922-1923 for the first time to any institution, 560 were suffering from this same disease. Of the 1919 patients who died during this same year, 425 were cases of general paralysis. The average hospital life of patients admitted with this disease and who die in our state hospital is 1.11 years. Although over 500 patients were discharged as recovered, from the various state hospitals of Illinois during this same year, there was not one case of paresis—a shorter term for this same disease—among them.

The statistics of the state of Illinois are true for those of the United States in general, and even the enormous aggregate thus revealed does not account for all the ravages produced by this dread disease. Many patients doubtless die in private institutions or in the home before their conduct has become so bad as to necessitate hospitalization. Upon the average they are men in early middle life, men who have arrived at the most productive time of life, and have assumed the responsibilities of wife and children. In a recent study made by a social service worker in the East, it was found that the majority of the families of these patients became dependent upon charity or the earnings of the wife and mother who was forced to go to work when her husband went into the hospital.

Of the 560 patients admitted in 1922-1923 only 95 were women, thus leaving 465 men representing, at a valuation of \$10,000 each, a loss to the state of Illinois of \$4,650,000—aside from the cost of maintaining them in an institution for a year and a month, an expenditure which would run the total figure well up to \$5,000,000.00!

This is a problem with which we have to deal in our state hospitals—a problem of the end results of syphilitic infections dating back from 10 to 20 years prior to the patients commitment as insane. It is said that

about 5 out of every 100 syphilitics develop locomotor ataxia or general paralysis of the insane. Obviously the rational way in which to deal with this problem is along the lines of prevention; first, the prevention of infection, and secondly, the prevention of the involvement of the central nervous system. But the prevention of venereal disease is a problem of social hygiene, while the prevention of an involvement of the central nervous system belongs for the most part to the syphilographers. What the state hospitals must endeavor to do is to make what repairs are possible to the damaged human mechanisms committed to our institutions for care and treatment.

By general paralysis of the insane, or paresis, we understand a disease of the central nervous system especially affecting the cortex of the brain itself, as differentiated from other syphilitic conditions involving the meningeal coverings of the brain or the walls of the blood vessels or the production of new growths, gummata, in connection with the meninges or blood vessels. Formerly it was thought that while syphilis had something to do with laying the general foundation for paralysis, other factors such as over work conditioned its development. This opinion, however, has of late years been revised by the discovery of Moore and Noughchi (in 1911) of the *spirochaeta pallida* in the brain substance of these patients. There is still, however, considerable discussion as to what determines this invasion of the brain. Some, notably Levaditi, contend that there are strains of this organism which are neurotrophic, having a predelection for nerve tissue, while others, dermatrophic in nature, by preference locate in other parts of the body and produce visceral syphilis. Certain experiments of Levaditi would seem to corroborate his views. As a matter of fact, it is quite commonly accepted that patients developing paresis have suffered few if any of the secondary and tertiary lesions common to ordinary syphilitic infection.

It has been well established by many observers that about 20 per cent of infected patients show early in the course of the disease some changes in the spinal fluid,

indicating an early involvement of the central nervous system, and it is probable that patients who later suffer from disease of the central nervous system are recruited from the ranks of those who suffer such early involvement; hence the necessity of examination of the spinal fluid in all cases of syphilis, with treatment especially directed to combating this invasion.

Unfortunately for our problem as to the treatment of paresis in state hospitals, the patients do not come to us until their behavior as the result of brain involvement has become so bad as to necessitate their separation from home and society. This means that, given an average duration of three years from the appearance of symptoms to the death of the patient, the state hospital has to deal with patients who are well along in the course of the disease, probably two years at least upon the average. Obviously considerable structural change has taken place and therapy is thus rendered so much the more difficult. The infected organism lies in the brain substance itself and is exceedingly difficult to reach with any drug known to us at the present time.

The history of the treatment of paresis is one of many therapeutic gestures and relatively small accomplishment. Fortunately for the paretic and unfortunately for the establishment of facts concerning cures, the disease is subject to spontaneous remissions in from eight to ten per cent of cases. Thus the patient who is apparently quite demented and about ready to die may without apparent cause or following an attack of erysipelas or other intercurrent infection, make a remarkable improvement which may last anywhere from a few months to many years, but inevitably the patient dies of his disease sooner or later—unless intercurrent disease carries him off meanwhile. For this reason statistics concerning the results of various treatments are unreliable unless observation is carried on over a long period of years, or a very high percentage of remissions are secured in a considerable group of treated cases.

It is unnecessary to recite the long history of the treatment of paresis here. Very naturally the discovery by Ehrlich of the arsenical known as salvarsan aroused

great hopes, and many favorable reports were received following the treatment of patients in various ways with this and allied drugs. Of late years, however, pessimism has again evidenced itself in numerous reports of considerable numbers of cases in which the results have been disappointing. This is notably true of various observers working in the state hospitals of New York State, where the number of patients benefitted, as quoted by Mills and Vaux (*Archives Neurology and Psy.* Vol. 9, No. 4) was only 15.9 per cent in 1920 and 13.8 per cent in 1921. Intra-spinal treatment was taken up with great enthusiasm at the time of the announcement of Swift and Ellis that favorable results had been obtained by the introduction into the subdural spaces of the patient's own blood serum following the intravenous injection of salvarsan. At the present time, however, but few clinicians are using this form of treatment in state hospital practice—and it must be understood that in this discussion we are limiting ourselves to such cases. Only a trace of arsenic can be found in the spinal fluid following intravenous injections of the arsenicals, and none whatever in the brain substance (animal experiments and investigation of cases dead from arsenical poisoning).

In 1917 Wagner-Jauregg of Vienna began to treat paresis with malarial infection upon the theory that the violent reactions thus obtained in some manner mobilize the defense resources of the organism, and reports a number of patients treated at that time to be still out of the hospital and doing well. At the present time reports upon this method of treatment claim a high percentage of remissions especially in the more incipient cases.

In May, 1923, Dr. Lorenz of Wisconsin with a group of workers (*Journal of A. M. A.* May 26th, 1923) reported as high as 50 per cent of institutional cases showing great improvement after treatment with tryparsamid, an arsenical derived from arsenic pent-oxide. Eighty per cent of the blood Wassermanns and thirty per cent of the spinal fluid Wassermanns became negative,—results heretofore not obtained with any type of treatment.

These findings were later confirmed by Moore of Johns Hopkins (Journal A. M. A., Feb. 16, 1924).

Following this inspiring report letters poured into our state institutions from anxious relatives inquiring if this new treatment could not be given to their patients, and accordingly in July, 1922, arrangements were made through the courtesy of Dr. Lorenz for a supply of this new arsenical, not yet upon the market, which can be given in very large doses—three grams each week intravenously, associated with a mercury salicylate. At the same time another group of similar patients was placed upon a modification of arsphenamine known as sulpharsphenamine. It is mainly with the results obtained with these two groups that this report has to do, although various other modes of therapy are being tried. At this same time 60 patients are under intensive treatment at the Elgin State Hospital with these and other remedies, notably new mercurials that can be given intravenously, a new arsenical allied to tryparsamid and a form of non specific treatment less dangerous than malarial infection.

We let the slides speak for themselves as to the exact results obtained, and summarize them in general as follows:

Remissions thus far secured in either group do not surpass the percentage that may be expected in cases treated in the usual manner with arsphenamine. The improvement in physical health in the tryparsamid group has been notable and many negative bloods have also been obtained, but no negative Wassermann in the spinal fluid as yet.

Several cases of apparent early optic atrophy (one or two of them very evident) have been found in both these treated groups, though the patients in the tryparsamid group were the only ones examined at the beginning of treatment.

Some of the sulpharsphenamine treated cases have also made marked improvements (one remission) but 25 per cent are worse than at the beginning of treatment, whereas none in the tryparsamid group have apparently deteriorated.

Though somewhat disappointed in the present results, the reporters realize that they have had to do with very unfavorable types for treatment and that it is really too early to draw worthwhile conclusions as to the results of this effort. In justice to the remedies employed another six months must elapse before publishing results in detail.

The reporters are grateful to Dr. Hinton, Superintendent of the Elgin State Hospital for his most cordial cooperation, to Dr. Hughes of Elgin for his painstaking examination of the fundi, and to Dr. Lorenz through whose courtesy a supply of tryparsamid has been received until quite recently.

The writer is continuing, in collaboration with Dr. Pas-kind of the Elgin State Hospital staff, this rather intensive piece of therapeutic research and hopes in another six months to have some very definite conclusions for publication.