

Cheatham (W.)

## THE PRESENT STATUS OF THE SERUM TREATMENT OF DIPHTHERIA.\*

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As there have been over one million injections of antitoxin made up to this time, some proper conclusions as to its use and results are being arrived at. It has reached such a stage that an assertion made many months ago "that it is criminal to treat a case of diphtheria in its early stage without antitoxin" can be justly repeated with increased vehemence.

Such investigations have been made as to render positive assertions as to its efficacy possible. The fight between the exponents and opponents of the serum treatment of diphtheria was at one time too vindictive and too personal to be of any scientific advantage; as the hot-heads have cooled down enough to analyze facts, they have come to realize the truthfulness of the saying of Virchow early in the fight. All the arguments of the opposition have been met and silenced, except a very few, and even those who advanced such arguments are now, in pool-room vernacular, "hedging."

We can not yet claim it as a specific, yet Jacobi, who at first opposed the use of the serum, says in a recent article, "It will be entitled to be claimed as a specific, though it have not the power to cure every case of diphtheria, any more than quinine cures every case of malaria, or mercury of syphilis." Many say, if injected the first day of the disease, no case need die.

My experience with it has been exceedingly favorable. Of the many cases in which I have used it, there have been exceedingly few deaths, and my dread of diphtheria has decreased to such proportion as to render me very much less worried when called to see a case. It does not do away with other treatment, as many suppose, but does away with so much of it as to render it almost *nul*, not only as to quantity but as to perseverance and severity. A case seen in the last few days will illustrate what I mean. All cases do not end so, but it is more the rule than the exception.

J., a girl five years old, had had diphtheria, so far as known, two days; she was quite hoarse; pulse weak and irregular; a typical mem-

\*Read before the Louisville Medico-Chirurgical Society, January, 1897.



brane was on the palate and pharynx; it was a typical case of diphtheria of the pharynx, soft palate, and larynx; a case in which, without antitoxin, I would have immediately advised intubation. I gave her 4 c. c., or 1,000 units of serum, injecting it into the outer part of the left thigh. I first washed the part well with alcohol, and used ethyl chloride as a local anesthetic; with this the injection gave little or no pain. A five-per-cent solution of acid carbolie can be used instead of the alcohol; it is not only a good cleanser, but also a local anesthetic. My needles I wash in the same solution. After the injection no pressure was made to distribute the serum. The part was again bathed with alcohol, and a small piece of cotton with alcohol on it placed over the wound, and held in place by an adhesive strip. No reaction whatever followed. All membrane in sight was gone the next day; pulse was good, temperature about normal; patient with a good appetite, and voice nearly clear in three days. As I stated before, this is not an exceptional case. The little patient made a good recovery.

○ If the general practitioner who usually sees these cases first will early in the disease make or have made a serum injection, the above history will be much more common than it is now. Do not wait for a bacteriological investigation. The serum, if fresh and pure, and if properly injected, is harmless; and a membrane in a throat with no history of trauma means, in ninety-five cases in a hundred, diphtheria—so why wait. As to the objections urged against the serum treatment of diphtheria, all of them have been about swept away by the investigations and conclusions of 1896. A few deaths have been attributed to its use, but not proven. Five, I believe, in over one million of injections, and not one which could be proven beyond any doubt as the result of the serum. It is true, death might not have occurred in three of the cases had not the injection been made. Even admitting that five or twice five deaths had been the direct result of the serum injection, who of us would not take such a chance? Some of these cases were very sad indeed, cases in which the injections were made for immunity; this, I think, is unnecessary in a majority of cases, as there are no better immune agents than fresh air and sunlight. Still reports as to immunizing are very encouraging, as will be seen from the following, which is from Dr. Biggs' last report, *Medical News of New York*, December 26, 1896: Number of cases 17,516. Of these there were 109 attacked with mild diphtheria in thirty days, and 1 fatal. After thirty days there were 20 mild, and 1 fatal; or in 17,516 cases there were 129 mild cases

and 2 fatal, which I think is a great result. The other statistics of Dr. Biggs seem to me to be unanswerable. For instance, in 79,085 cases treated by antitoxin in different parts of the world, the death-rate was about 16 per cent; in cases treated without antitoxin the death-rate was between 30 and 40 per cent. Or, take another series of cases: In a total of 2,930 cases treated with antitoxin 436 died, giving a mortality of 14.9 per cent, while of 3,625 cases treated without antitoxin at the same time, or during intervals of forced interruption (owing to lack of antitoxin), 1,455 died, a mortality of 40 per cent. Virchow, who is frequently quoted, and who at first was opposed to the use of antitoxin, said, "All theoretical considerations must give way to the brute force of the figures, and I consider it the duty of every physician to use a remedy giving such clinical results."

Dr. Herman M. Biggs says further, in his more recent article, that "Baginsky, in commenting on this circumstance, says, 'It is all the more remarkable, as the ratio of mortality of those treated with the serum, before and after the period of interruption, varied within very small limits. If one will permit figures to speak at all, there has scarcely been made on human beings a more demonstrative test of the curvative power of a therapeutic agent. It was an experiment forced upon us, but it proved to us how terrible was the form of disease which we were treating, and how numerous would have been the victims without the use of the healing serum.'"

Prof. Virchow again reiterated his opinion in a report which was read on the antitoxin treatment of diphtheria in the same hospital, on December 25, 1895, when he said, that from April to November of that year 303 cases out of 335 treated had recovered, the mortality, which had formerly been 43 per cent, having decreased to 9.5 per cent.

Vucetig reports two groups of cases of 30 each, one treated with antitoxin and the other with Loeffler's solution; the antitoxin cases gave a mortality of 6.6 per cent, the others a mortality of 20 per cent.

According to the official records of the Austrian Health Department there were treated during the month of February (1896) in all Austria 1,128 cases with antitoxin, with a mortality of 13.2 per cent, whereas 1,849 cases, which were treated without antitoxin at the same time, gave a mortality of 38 per cent.

Rauchfuss reports 34 cases treated in hospital with a mortality of 21 per cent, and 30 control cases treated at the same time without antitoxin with a mortality of 52 per cent.

Von Engel in Bohemia reports 39 cases treated with antitoxin with a mortality of 25.5 per cent, and 62 cases treated at the same time without antitoxin with a mortality of 50 per cent. The antitoxin cases in these reports are said to have been unusually severe, and therefore taken as a test of the new remedy.

Heubner reports 299 cases treated with antitoxin in the Hospital Charite in Berlin with a mortality of 16.7 per cent, and 249 cases treated in the Bethany Hospital at the same time under the same conditions of age, season, etc., without antitoxin with a mortality of 43 per cent.

Blumenfeld reports 229 cases treated in private practice with antitoxin with a mortality of 8.7 per cent, and 48 cases not treated with antitoxin, because they were considered to be *too mild*; the mortality among the "mild cases" was 23.6 per cent as against 8.7 per cent among the apparently severer cases treated with antitoxin.

Many examples of the same kind might be cited from the published reports, fuller details of which will be found in the Bulletin of the Health Department (of New York), but from these it may be seen that the antitoxin treatment has stood the test of comparison with other approved methods of treatment whenever the contrast has been decidedly drawn.

The date of the administration of the antitoxin is of the greatest importance; this is really the obstacle that is the most difficult to overcome in this treatment of diphtheria. All who use it know the several reasons for it, which are not necessary to give here; the cost is but little, and any doctor with a clean hypodermic syringe should be able to use the remedy. So the objections which have heretofore been advanced against the use of diphtheria antitoxin are being, as I stated before, rapidly dissipated.

The amount of membrane present does not indicate the amount of sepsis to be expected. I hear gentlemen reporting cases in which there was membrane covering an immense space and yet the child got well. So long as this does not act in a mechanical way to obstruct respiration it is not necessarily of great prognostic importance, as I have frequently seen such cases get well, while others died promptly with an exceedingly small amount of membrane. Its location and the activity of the absorbents, with the power of resistance of the patient, have more to do with the result. Other toxins, the result of other bacilli than that of Loeffler, are the cause of the bad results in many

cases of diphtheria, whether antitoxin is used or not. So, when antitoxin fails, it is not so much the failure of the remedy as it is that of the ignorance or carelessness of the attending physician in not making the injection before other toxins are produced. All of us see such cases, not only of our brother doctor but of our own, and in making these statements I include myself with the derelict. Many of these cases, in small children especially, have membrane in undiscoverable localities. In such cases the heart and general condition of our patient can be our only guide.

In a certain class of cases, I refer to those in which croup is a prominent element, even with no membrane in sight, with our present knowledge of its pathology, there should be no hesitancy in using the serum, and I believe one who does not use it is guilty of great negligence. We can have membrane on the cords which might be difficult to make out although the patient will permit the examination; and it must be remembered that membrane in this location, if it does not produce mechanical obstruction, may give little or no constitutional disturbance, as its products are not absorbed on account of the presence of a normal basement membrane in the mucous lining. To the serum in these cases calomel by fumigation can profitably be added. These cases in which intubation and tracheotomy had to be performed formerly, and those in which the conjunctivæ are involved, cases in which before antitoxin was used a majority of the eyes were lost, demonstrate to us the wonderful and beneficent effect of antitoxin in diphtheria.

In one hospital in New York the number of cases of broncho-pneumonia occurring after the use of antitoxin was urged against the use of the remedy. As soon as the rooms were kept at a temperature of 70° there were no more cases of broncho-pneumonia which had not developed before admission. The serum does not effect the blood unfavorably; the eruptions and joint involvements it occasionally produces amount to nothing: it has been demonstrated beyond doubt that its use does not increase the danger of any kidney involvement nor after paralysis.

In all the cases in which I have used antitoxin I have never seen an eruption or a joint involvement; have never had but one to die of the kidneys; have seen but little paralysis; have seen the membrane disappear in half the usual time; have usually seen the temperature fall promptly, and the child's appetite improve very much. The cheer-

fulness of the patient improves wonderfully, all this with antitoxin alone, or with little or no other treatment, either local or general. This is not in all cases. If the child receives the injection late, cell tissue destroyed can not be restored. Bearing on this point is a recent report on a recent epidemic in Chicago. Of sixty-one children injected the first day of the disease, all got well; of one hundred and eighty-seven the second day, three died; of three hundred and seventy-two the third day, ten died; of one hundred and nine the fourth day, seventeen died. From this the importance of an early injection can be readily seen. A fair criticism of any remedy can result in nothing but good. Professor Soltman gives us the following quotation from a German poet:

"The best critics in the world are they  
Who, along with that which they gainsay,  
Suggest another and a better way."

These three lines answer, I think, all criticisms that have been made on the serum treatment of diphtheria. It is not a cure-all. The dose and some few other points of importance, in my opinion, have not yet been definitely settled. Even accepting the statistics given as "double edged," yet, as Soltman says, "Suggest another, and a better way." I believe the serum treatment of diphtheria is the best that has yet been offered; that in the full sense of the word it is not a specific; yet, if used in the first or second days of the disease, in the proper dose (which has not yet been definitely settled), it is as much a specific as quinine in malaria, or pot. iod. and mercury in syphilis.

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