

Discussion on diphtheria / John Glaister.

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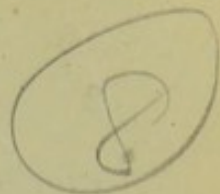
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GLASGOW MEDICO-CHIRURGICAL SOCIETY.

SESSION 1894-95.

MEETING IX.—22ND MARCH, 1895.

The President, DR. HECTOR C. CAMERON, in the Chair.

DISCUSSION ON DIPHTHERIA.

DR. GLAISTER.

THE discussion was resumed by Dr. Glaister, who said that, after the previous very exhaustive consideration of the subject from a bacteriological standpoint, he proposed to limit his remarks to three points—viz., the statistical, the preventive, and the narration of cases.

STATISTICS.

The earliest published cases of diphtheria treated by serum are quoted from the *Deutsche Medicinische Wochenschrift*, 27th April, 1893,¹ and were a series of 30, by Behring and Kossel; of these, 24, or 80 per cent, recovered.

On 19th April, 1894, Ehrlich, Kossel, and Wassermann, in the same journal, published the results of 220 unselected cases of diphtheria treated by serum of goats rendered immune by giving them increasing doses of dead diphtheria cultures.

Among the 153 cases in which tracheotomy was not needed, the mortality was 23·6 per cent.

Then Weibgen - Hahn's clinic in Berlin (same journal, 19th July) reported 65 cases. Certain patients of this number required tracheotomy, and of these 44 per cent recovered. Of the others, 72 per cent recovered. The type of disease was, however, benign.

*French Statistics.*²—Before using serum the mortality from diphtheria in Parisian hospitals, according to Roux, had scarcely

¹ *British Medical Journal*, 8th September, 1894, p. 545.

² *Cf. British Medical Journal*, 27th October, 1894, p. 931.

ever been below 50 per cent; since its use, the mortality has fallen to less than 24 per cent, all of the cases being diagnosed bacteriologically. In the diphtheria wards of the Trousseau Hospital, for the four years before the serum treatment, the mortality was 51·71 per cent of the total cases. From 1st February to 24th July, 1894, the serum treatment was applied on 448 children, of whom 109 died, equal to 24·5 per cent mortality. During the same time, at the Trousseau Hospital, when the serum treatment was not used, there were 520 cases, of which 316 died, equal to 60 per cent mortality.

To show that in the period of time chosen the results were not attributable to the presence of a *benign* type of the disease, in the cases treated by serum at the Hospital for Children the mortality fell to 12 per cent; while during the same time, at the Trousseau Hospital, without serum, the mortality was 32 per cent, while over Paris, during the previous four years, of deaths where tracheotomy was not required, the mortality was 33·94 per cent.

A committee of the Paris Academy of Medicine, appointed to consider the value of the "serum" treatment of diphtheria, reported that, after observation, "We are now in possession of a specific treatment of diphtheria as powerful as it is harmless."

"*The Brute Force of Figures.*"—In the early part of December last year, the Medical Society of Berlin had under discussion this new diphtheria treatment. Dr. Hansemann opened by a strong indictment against the treatment, especially against the theories upon which it was based. He did not believe that the Loeffler bacillus was the cause of all cases of diphtheria; and while he admitted the cures obtained, he asserted that the cures were not from diphtheria, but only from "diseases caused by Loeffler's bacillus." He further complained that urticaria, purpura, fever, cardiac weakness, rheumatic pains, coma, violent perspirations, albuminuria, were apt to immediately follow the treatment, although he acknowledged not a single patient had died from any of them.

The veteran pathologist, Professor Virchow, took part in the debate later on; and, as one previous speaker mentioned in the course of his remarks, "A burnt child shuns the fire, and from tuberculin I had carried away bad burns," it was to be expected that Virchow's views would be worth listening to, and also great deference paid to them. Virchow told his audience that this new treatment was begun, in March of last year, in one of the Berlin hospitals, and that by June and

July all the diphtheria cases admitted were treated with this serum. The results were:—

CHILDREN.			CHILDREN.		
	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	13	1	5th week,	6	2
2nd „	9	1	6th „	1	1
3rd „	6	2	7th „	3	0
4th „	12	1	8th „	5	0

The supply of serum suddenly ceased, because the horses which supplied the serum died. The hospital authorities were compelled to fall back upon the usual ordinary lines of treatment, with the following results:—

	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	5	7	5th week,	8	5
2nd „	6	8	6th „	8	12
3rd „	6	6	7th „	13	6
4th „	8	11			

The hospital authorities, alarmed at the increased mortality, obtained a new supply of serum; immediately a beneficial change took place in the mortality rate:—

	Cases Cured.	Deaths.		Cases Cured.	Deaths.
1st week,	3	2	4th week,	14	2
2nd „	4	1	5th „	17	1
3rd „	14	1	6th „	17	5

—the total figures being 533 cases, of which 303, treated with serum, had a percentage death-rate of 13·2; while 230, treated without serum, had a percentage death-rate of 47·8. After the narration of these facts and figures, Virchow added: “All theoretical considerations must give way to the brute force of these figures.” He held it to be the duty of every physician to use the remedy in every case of diphtheria, although he himself could not explain the action of the serum.

In the course of the same debate, Professor Baginsky,¹ of the Kaiser and Kaiserin Friedrich Hospital, upheld the treatment. He stated that, during the year 1894, he had 533 cases of diphtheria. Of *these*, 303 had been treated with serum, with 40 deaths, equal to 13·2 per cent mortality; and 230 had not been treated with serum, with 110 deaths, equal to 47·82 per cent mortality. “No previous remedy,” said he, “had done for diphtheria what the serum had done.”

¹ *British Medical Journal*, 22nd December, 1894, p. 1458.

Vienna Discussion (Royal Medical Society).—Dr. Unterholzner gave figures of treatment in Leopoldstadt Children's Hospital, Vienna, as follows:—

TREATED WITH SERUM.			TREATED WITHOUT SERUM.		
Age.	Treated.	Died.	Age.	Treated.	Died.
Under 1 year,	2	1	Under 1 year,	2	1
1 to 2 years,	9	5	1 to 2 years,	6	6
2 to 3 „	7	2	2 to 3 „	7	6
3 to 4 „	3	0	3 to 4 „	5	4
4 to 5 „	2	0	4 to 5 „	2	2
5 to 6 „	1	0	5 to 6 „	2	1
6 to 7 „	2	0	6 to 7 „	2	2
7 to 8 „	2	0	7 to 8 „	6	1
8 to 13 „	3	0	8 to 13 „	4	1
	31	8		36	24

Further Statistics from Austria.—Dr. Germonig,¹ to the Medical Society of Trieste, gave the results of the treatment of 224 cases of diphtheria by Behring's serum, the mortality being 20·3 per cent. The mortality (usual) from this disease in the civic hospital in the years from 1886 to 1894 was 60 per cent of all cases admitted. To show the type of disease from which the above 224 suffered, he pointed out that of 65 cases treated without serum, 33—*i. e.*, 50·7 per cent—died.

British Statistics.—Paper read before the Clinical Society of London by Drs. Washbourn and Goodall and Mr. Card jointly²:—

CASE MORTALITY OF DIPHTHERIA IN CHILDREN UNDER 15
AT THE EASTERN HOSPITAL, LONDON.

	Cases.	Deaths.	Mortality Per Cent.
1893,	397	166	41·8
1st January, 1894, to 22nd October, 1894, .	400	144	36·0
„ 1893, to „ 1894, .	797	310	38·8
14th September, 1894, to 22nd October, 1894 (39 days, not treated with serum), . . .	72	28	38·8
23rd October, 1894, to 27th November, 1894 (36 days, cases treated with serum), . . .	72	14	19·4

Mortality reduced 50 per cent.

¹ *British Medical Journal*, 2nd February, 1895, p. 262.

² *British Medical Journal*, 22nd December, 1894, p. 1418.

FIGURES ILLUSTRATIVE OF TREATMENT OF DIPHTHERIA AT THE WESTERN FEVER HOSPITAL, LONDON, WITH AND WITHOUT ANTITOXIN.

1. Without Antitoxin.

CASES ADMITTED FROM 26TH NOVEMBER, 1893, TO 25TH JANUARY, 1894.

AGE PERIODS.	Admissions.	Deaths.	Percentages.
0 to 5 years,	20	12	60
5 to 10 ,,	21	6	28·57
10 to 15 ,,	7
15 and upwards,	10	1	10
Totals,	58	19	32·85

2. With Antitoxin.

CASES ADMITTED FROM 26TH NOVEMBER, 1894, TO 26TH JANUARY, 1895.

AGE PERIODS.	Admissions.	Deaths.	Type of Disease.			Complications.		Death-rate.
			Severe.	Moderate.	Mild.	Rashes.	Arthritis.	
0 to 5 years,	40	5	15	18	7	10	1	} 14·7 per cent.
5 to 10 ,,	22	5	13	7	2	6	1	
10 to 15 ,,	4	...	2	2	...	3	2	
15 and upwards,	2	...	2	1	...	
Totals,	68	10	32	27	9	20	4	

All the above cases were verified as being diphtheria by bacteriological diagnosis.

In the North-Western Fever Hospital, of 43 cases, diagnosed bacteriologically and treated with serum, only 2 died, giving a death-rate equal to 4·6 per cent. Of the 43 cases, only 7, however, were deemed severe.

ANTITOXIN TREATMENT OF DIPHTHERIA—TABLE OF CASES COLLECTED DURING PREVIOUS THREE MONTHS¹ BY COMMUNICATIONS FROM VARIOUS MEDICAL MEN.

Total Number of Cases.	Deaths.	Percentage of Deaths.
95	22	23·1

¹ Cf. *British Medical Journal*, 2nd February, 1895, p. 259.

PREVENTION.

So far back as 1887 the Port Health Authorities of New York adopted bacteriological examinations for the diagnosis of epidemic cholera, which were found of "incalculable" service. In 1892 the City Sanitary Authorities followed suit, establishing a bacteriological laboratory for this purpose.

Arising out of this, the investigation of doubtful cases of diphtheria followed as a matter of expectation, and examinations were made, in 1892, of about 400 cases of diphtheria which were under treatment in the health hospitals. Dr. Biggs reported that the value of such work was priceless, and that every opportunity should be afforded the profession of New York in having preliminary bacteriological examinations made of all doubtful cases of this disease. This report was adopted, and the scheme was put into operation in May of 1893. That it was recognised as a great boon by the medical profession is evidenced by the fact that, in the first year thereafter, 5,611 cases had been examined by bacteriological tests. About two-thirds of the total number were proved to be *bonâ-fide* diphtheria, although the physical signs were doubtful.

New York was, therefore, the first Sanitary Board in the world to take this step. This example has been since followed by other large cities of the United States, by the U.S. Marine Hospital Service, and by the medical corps of the U.S. army.

Of the advisability and great usefulness of such a laboratory not a single word requires to be said. It is unfortunately too true that there are always doubtful cases, the diagnosis of which can only be accurately made, and conclusively fixed, by bacteriological examination. From this much undoubted harm arises, not only in private life, but also in public epidemic hospitals. A doubtful diagnosis may give rise to needless alarm in a family circle, or that circle may be lulled into a false repose; a scarlatinal sore throat may be diagnosed as diphtheria, and the patient put into a ward for the treatment of diphtheria cases, with grave risk alike to the new-comer and to the occupants. All this is prevented when facilities are given for bacteriological examination. In order that such a scheme may be carried out satisfactorily, certain details require consideration, but they can be overcome successfully.

Systematic bacteriological examination has also the great advantage that it enables the physician to say, in a way he cannot otherwise certainly do, that the patient who has been suffering, is or is not, after a lapse of time, free from the

disease. For it has been clearly shown that, occasionally, some time after the physical signs have disappeared, bacilli are found remaining in the air-passages. While, in the large bulk of cases, it may be said that patients who have survived are free from infection by the end of twenty-one days, examination by bacteriological tests has demonstrated the bacilli in the air-passages—in some cases at the end of *four*, and also at the end of *five weeks*, showing that, during this increased period, the patients are still infectious.

When a case of diphtheria attacks one child in a family of children, usually the attacked child is isolated, while the others are sent from the house, to perhaps turn ill later on. They are supposed to be free of the disease because they show no signs of illness; but it has frequently been demonstrated that, although showing no signs of illness, these children have the characteristic bacillus of the disease in their air-passages. Under such circumstances the early forewarning would enable measures to be more quickly taken.

TREATMENT, WITH NARRATION OF CASES.

In Great Britain, Dr. Armand Ruffer was the first to treat the horse by Roux's method, and the first to prepare the first antitoxin made in this country. In the month of October of last year, Dr. Russell, the senior Medical Officer of Health of this city, and myself required to be in London on matters which embraced an inquiry into this department, and one of the places we visited was the British Institute of Preventive Medicine. Dr. M'Fadyen, the distinguished collaborateur of Dr. Ruffer, was good enough to give us elaborate details on this subject, and he informed us that the first serum of the first horse treated in Great Britain was to be drawn from the animal that morning. We were in the laboratory when the beakers containing the blood—consisting of a well-defined clot and separated serum—arrived from the stable; and we thus, in an indirect way, assisted at the first step in the antitoxin manufacture in this country.

To add to our many other obligations, Drs. Ruffer and M'Fadyen were good enough to forward to each of us a satisfactory quantity of this same serum after it had been standardised. What the fate of this was, in my own case, will fall to be now related.

Since I received my first supply of serum from Dr. Ruffer, on the 10th of last November, I have only seen two cases of diphtheria, and neither of these was under my own care;

therefore, what is to be said of them has the additional value that each case has the testimony of two observers.

CASE I.—The first case was one in Kincardine-on-Forth, and the patient was injected by me on the 13th of November. The patient was about 9 years of age, and his uvula, fauces, and post-pharyngeal wall were found covered with exudation. The quantity of serum injected was 15 c.c., by means of a Koch syringe. Dr. Reddie, under whose care the patient was, wrote me, the day following, that after the injection the patient slept most of the day, the temperature was normal, and pulse 84 at night. Next day, the 14th, the membrane appeared less extensive; seemed shrunken and looser; other symptoms favourable. On the morning of the 15th, Dr. Reddie reported that there was not a trace of membrane to be seen, but the parts appeared reddened from which the membrane had separated. The boy made an uninterrupted recovery. Dr. Reddie remarks in his last letter that “although, at the time you saw him, his temperature was normal and everything looking favourable, still I do not think the membrane would have disappeared so quickly without antitoxin, even under the best results of the old treatment.”

CASE II.—The second case was under the care of Dr. Pride, of Neilston. The patient was the third person attacked in the house, the two previous having died. I used the serum on the 1st December. After the injection, the boy, writes Dr. Pride, “slept for an hour, awaking in a profuse perspiration, but with no rigor or tendency to it. The pulse and temperature, before the use of the serum, were each 100. When I called at 4 P.M. the pulse was 84; temperature, 100°. At 11.40 P.M. I found pulse 84; temperature, 99.4°; and the patches now looked whiter and thinner.

“Next day, the 2nd (morning), pulse, 84; temperature, 101°. Patient has coughed up blood-stained mucus, and has bled from nostrils a little. Membrane on left tonsil shreddy looking; that on right thinner and smaller, but not loosening at edges. At night visit the pulse was 76; the temperature 99.3°. Next day, the 3rd (morning visit), the patient has perspired copiously in early part of night, and afterwards slept calmly; pulse, 72; temperature, 99°. On looking into the throat, I find membrane quite gone, having been coughed up in early morning, and an excavated ulcer occupies site of membrane on right tonsil, where separation first appeared. I need scarcely say the result is most satisfactory.

“Since writing the above, I find this morning a greyish patch of membrane has reappeared at front edge of the ulcer spoken

of as on right tonsil. Otherwise the lad is doing well, though pulse is 86, and temperature $100\cdot3^{\circ}$ —a rise in both. I hope these portend no new disturbance."

Again, on the 6th, Dr. Pride wrote me to say that "the membrane has all disappeared from the boy's throat," and that "he is now doing very well indeed." The boy made a rapid and excellent convalescence.

In addition to these three cases in this house, two having died, the third being the subject of the foregoing clinical remarks, two other children, who were removed to Glasgow on the outbreak of the attack, were also seized with the disease, and were treated in Belvidere Hospital. They also recovered after a prolonged illness.

I can form no conclusion of the general value of the serum treatment from these two cases, but I agree with both of my medical friends that ordinary remedies would not have produced such a rapid disappearance of the membrane, and such a summary conclusion of the disease. I will feel it hereafter to be my duty, as soon as I diagnose this disease, to at once apply this remedy, for I believe that it is a very valuable antidote to the disease, based, as it is, on right lines.

