TETANUS PUERPERALIS.

By KEDARNATH DAS, M.D.,

TEACHER OF MIDWIFERY, CAMPBELL MEDICAL SCHOOL, CALCUTTA.

THE rarity of this terrible and almost fatal complication of the puerperal state warrants publication of the following successful case. Tetanus is known almost from time immemorial, and has been studied by scientific men of all ages; but it is only since the discovery of the specific bacillus by Nicolaier in 1884 that its study has received a scientific foundation. At the present day we must define tetanus as "an acute infectious disease which is invariably and indubitably caused by the entrance into the system of the specific micro-organism—the bacillus tetani of Nicolaier and first cultivated in pure culture by Kitasato in 1891 in an anaerobic medium." In the present light of bacteriology and animal experiments there is certainly no place in the description of a given case of tetanus for the diagnosis "idiopathic" or "rheumatic." The only interpretation that can be put is that in these cases the point of infection has not been well searched for or found. The so-called varieties only indicate the seat of infection, the "puerperal" variety thus indicating that a breach in the parturient tract is the point of infection.

A Hindu female, aged 28 years, was delivered of a full-term child on July 20th, 1900. The child had trismus neonatorum on the tenth day and died within 24 hours. The mother had lock-jaw and stiffness of the neck since July 30th. She was admitted into the Campbell Hospital, Calcutta, on August 3rd, 1900, when she had well-marked symptoms of tetanus—opisthotonos, jaw completely locked, spasms very frequent, constipation, pulse 120, small, and compressible, and temperature 100.2° F. She was at once given an intra-uterine douche of perchloride of mercury lotion (1 in 2000), an ordinary soap-and-water enema, followed by an enema of 40 grains of chloral hydrate and five grains of calomel on the tongue. She was subsequently kept under the influence of chloral, the drug being given per mouth or rectum. Occasionally she had to be given very large doses of it and during one night she had three enemata of 40 grains each. During the course of the illness she was given apomorphia four or five times hypodermically in addition to chloral per rectum when she could not take medicine by the mouth. I also had recourse to intra-cellular injection of normal saline solution (under the breasts) several times during the course of the illness with a view to help elimination of the toxins. The spasms did not completely abate till Sept. 18th—i.e., six weeks after admission. The bowels were kept well open. Plenty of liquid food was given regularly. The total quantity of chloral used was eight ounces, six drachms, and ten grains. She had in addition as much bromide of potassium and a quantity of tincture of Indian hemp.

The prognosis is very grave. The average mortality of tetanus, taking all the so-called varieties together (as given in English text-books), is between 80 and 90 per cent. Garrigues has collected 57 cases of puerperal tetanus and the mortality is put down between 84 and 92 per cent. (*vide American Journal of Obstetrics*, 1883). I have been able to collect 68 cases from literature, a tabulated list of which is given below. In compiling this I have excluded all cases in which there has been any doubt with regard to diagnosis. Of these 68 cases only five patients recovered, giving a mortality of 92 per cent. The cases can be subdivided into three groups. In the first group (i.e., Cases 1 to 43) we have cases collected from English text-books and periodicals. Of the 43 cases three patients recovered, or a mortality of 93 per cent. In the second group (i.e., Cases 44 to 64) we have cases treated with antitoxin given either subcutaneously or by intra-cerebral injection. Of these 21 cases one patient only recovered (treated with intra-cerebral injection + chloral + morphi-), or a mortality of 95 per cent. In the third group (i.e., Cases 65 to 68) we have Indian cases collected from the *Indian Medical Gazette* of the last 35 years. Only four cases of unmistakable puerperal tetanus have been found, with one recovery, or a mortality of 75 per cent. It may thus be seen that even with the best modern treatment the mortality of puerperal tetanus is appalling. It must, however, be remarked that the Indian cases seem to yield to treatment better than the other cases.

With regard to rational treatment of this affection we

List of Cases Collected from Medical Literature.

No.	Reporter's name.	Abortion ; premature labour ; or labour at term.	Number of days after which symptoms appeared.	Duration of disease in days.	Result.	Treatment.
1	Dr. Alexander Wood.	Abortion.	6	3	D.	Turpentine, tobacco, Indian hemp, &c.
2	Dr. Malcolm.	"	15	3	D.	—
3	Dr. Hislop.	"	6	3	D.	Opiates and croton oil.
4	Dr. Symonds.	"	7	3	D.	—
5	Dr. Velpeau.	"	?	?	D.	—
6	Dr. Ritchie.	"	11	6	D.	Laudanum and croton oil.
7	Dr. Adams.	"	7	3	D.	—
8	Dr. Lyell.	Labour.	5	5	D.	Opiates ; venesection ; turpentine.
9	Dr. Lever.	"	3	3	D.	Opiates ; venesection ; turpentine.
10	Dr. Mackinlay.	"	30	3	D.	Secondary hæmorrhage 24 days after labour.
11	Dr. Storer.	"	6	2	D.	—
12	Dr. Aubinais.	"	3	7	D.	—
13	"	"	4	—	R.	Bled six times ; 100 leeches ; musk, valerian.
14	"	Premature labour.	4	40	R.	—
15	Mr. Colles.	Labour.	15	2	D.	—
16	Dr. Christie.	"	2	—	D.	Hg. opium, warm bath.
17	Mr. Dickinson.	"	—	5	D.	Hg. opium, warm bath.
18	—	"	5	1	D.	Cæsarean section.
19	Professor Dubois.	"	13	3	D.	—
20	Professor Lawrie.	Abortion.	10	?	D.	CHCl ₃ .
21	Dr. Blacksham.	"	9	5	D.	—
22	Dr. Philipson.	Labour.	9	5	D.	—
23	Dr. Denham.	Abortion.	—	—	D.	—
24	"	"	—	—	D.	—
25	"	"	—	—	D.	—
26	"	Labour.	—	—	D.	—
27	Dr. Keeling.	"	10	8	D.	—
28	Dr. Wiltshire.	Abortion.	—	—	D.	—
29	"	"	—	—	D.	—
30	Dr. Bennington.	Labour.	6	1	D.	—
31	Dr. Dill.	Abortion.	10	72	R.	—
32	Dr. McLaren.	"	10	4	D.	Laudanum blister to spine.
33	Dr. McGregor.	"	7	1	D.	—
34	Dr. Gordon.	"	9	8	D.	Mustard poultices, opium, and calomel.
35	"	"	4	1	D.	Dover's powder, calomel, tobacco.
36	"	"	5	8	D.	Belladonna and lobelia.
37	Dr. Craig.	Labour.	9	2	D.	Tincture of Indian hemp.
38	Dr. Arnold.	Abortion.	11	—	D.	—
39	Dr. Werner.	"	—	—	D.	—
40	"	Labour.	—	—	D.	—
41	Dr. Viant.	"	5	2	D.	CHCl ₃ , Castor oil, and opium.
42	Dr. Netzel.	"	7	1	D.	Chloral morphia.
43	Mr. Peacock.	"	7	4	D.	"
44	Dr. Walko.	"	9	—	D.	Antitoxin.
45	Dr. McEwan.	Abortion.	7	—	D.	Antitoxin and chloral.
46	Dr. Blumenthal.	Labour.	7	—	D.	Antitoxin and chloral.

List of Cases collected from Medical Literature (continued).

No.	Reporter's name.	Abortion; premature labour; or labour at term.	Number of days after which symptoms appeared.	Duration of disease in days.	Result.	Treatment.
47	Dr. Merkel.	Abortion.	—	—	D.	Antitoxin.
48	"	"	—	—	D.	"
49	Dr. Rubeska.	"	9	9	B.	"
50	"	Labour.	19	—	D.	"
51	Dr. Pitha.	"	8	—	D.	Antitoxin, chloral, and anaesthesia.
52	"	"	8	—	D.	Antitoxin, chloral, and anaesthesia.
53	"	"	8	—	D.	Antitoxin.
54	"	"	8	—	D.	"
55	"	"	6	—	D.	"
56	Dr. Krauz.	"	7	—	D.	Antitoxin, urethane, and morphine.
57	"	"	9	—	D.	Antitoxin.
58	"	"	6	—	D.	Antitoxin and urethane.
59	"	"	10	—	D.	Antitoxin and urethane.
60	Dr. Leyden.	"	10	—	R.	Antitoxin (intracerebral), chloral, and morphia.
61	Dr. Pitha.	"	5	—	D.	Antitoxin (intracerebral) and morphia.
62	"	Abortion.	9	—	D.	Antitoxin (intracerebral) and morphia.
63	"	Labour.	9	—	D.	Antitoxin (intracerebral) and morphia.
64	"	"	5	—	D.	Antitoxin (intracerebral), morphia, and chloral.
65	Dr. R. N. Roy.	Abortion.	6	3	D.	—
66	"	Labour.	4	1	D.	—
67	Dr. Mallik.	"	15	—	R.	Chloral, 13½ drachms.
68	Dr. Mootoo-samy.	"	5	4	D.	—

References.—1, 2, Edinburgh Monthly Journal, April, 1850. 3, 4, Selected Obstetrical Works, Simpson, 1871, p. 573. 5, Essay on Puerperal Convulsion, p. 232. 6, 7, 8, 9, 10, Selected Obstetrical Works, Simpson, 1871, pp. 574-578. 11, American Journal of the Medical Sciences, January, 1842. 12, 13, 14, British and Foreign Medical Science. 15, Dublin Quarterly Journal, vol. xxx., p. 288. 16, Edinburgh Medical and Surgical Journal, vol. viii., p. 415. 17, London Medical Repository, vol. i., p. 192. 18, THE LANCET, vol. i., 1838, p. 388. 19, THE LANCET, vol. i., 1840. 20, Selected Obstetrical Works, Simpson, p. 590. 21, 22, Brit. Med. Jour., 1865. 23, 24, 25, 26, Dublin Quarterly, 1865. 27, Brit. Med. Jour., vol. i., p. 113. 28, 29, Obstetrical Transactions, vol. xiii. 30, British Gynaecological Journal, vol. i., p. 159. 31, Brit. Med. Jour., Oct. 7th, 1883. 32, Edinburgh Medical Journal, August, 1862. 33, Ibid., July, 1864. 34, 35, 36, American Journal of the Medical Sciences, January, 1866. 37, Ranking's Abstracts, vol. i. (1873). 38, 39, 40, London Medical Record, April, 1885. 41, 42, THE LANCET, July 31st, 1886, p. 218. 43, THE LANCET, August 17th, 1889, p. 313. 44, Annals of Surgery, August, 1900. 45, THE LANCET, August 8th, 1896, p. 381. 46-59, Annals of Surgery, September, 1900. 60-64, Ibid., October, 1900. 65, 66, Indian Medical Gazette, 1874, p. 182. 67, Ibid., 1877, p. 70. 68, Ibid., 1877, p. 290.

must look to the following points: (1) to destroy the bacteria at the seat of infection by thoroughly anti-septicising the parturient canal and by subsequently keeping it aseptic; (2) to eliminate the toxins already absorbed by brisk purgation and intra-cellular injection (under the breasts) of normal saline solution; (3) to overcome the symptoms induced by the action of toxins—viz., the increased reflex irritability of the higher nerve centres—and this is best accomplished by keeping the patient absolutely quiet in an isolated place and by chloral in very big doses, given either per os if possible, per anum, or hypodermic injection of apomorphia, hyoscine hydrobromate, or morphia; and (4) to neutralise the poison already absorbed

and to immunise the body after local infection has taken place. Both of these indications ought theoretically to be met by the injection of the serum of immunised animals. But the mode of action of the antitoxin has not yet been acceptably explained. Moschcowitz, in his masterly contribution on the antitoxin treatment of tetanus, published in the Annals of Surgery of August, September, and October, 1900, gives no very decided opinion with regard to the neutralising effect of antitoxin, after a careful analysis of 358 cases. Antitoxin treatment, he says, appears to have a distinctly beneficial influence on the course of tetanus and the statistics he has collected show that with this treatment the general mortality of tetanus has been reduced from 90 to 40 per cent. But the puerperal cases, taken separately, show no improvement in the percentage of recoveries. With regard to the question of immunising the body after local infection has taken place, this would involve the injection of antitoxin as a prophylactic measure in all wounds when there is reason to suspect the possibility of the subsequent development of tetanus. By such treatment it is asserted that an extensive epidemic of puerperal tetanus in a lying-in hospital at Prague was cut short and numerous instances of good results from a similar course have been recorded in veterinary practice.

Calcutta.

MERCURY AND IODIDE OF POTASSIUM INTERNALLY GIVEN WITH PILOCAR- PINE HYPODERMICALLY IN DISEASE OF THE EYES.¹

By G. HERBERT BURNHAM, M.D. TOR., F.R.C.S. EDIN.,
ASSOCIATE PROFESSOR OF OPHTHALMOLOGY AND OTOTOLOGY AT THE
UNIVERSITY OF TORONTO, TORONTO, CANADA.

CASE 1.—In August, 1899, a patient consulted me regarding an inflamed condition of the right eye. I found at the upper and inner part of the eyeball in the ciliary region very severe scleritis, limited, and the patch of exudation large, swollen, and deeply congested. The adjacent cornea was infiltrated with a cloudy opacity up to, and slightly beyond, the pupillary margin, and there were much pain, photophobia, &c. I gave for ten days mercury and iodide of potassium and used atropine locally. The severity of the symptoms was relieved, but the progress of the sclero-keratitis was not stayed.

Early in September, 1899, I began treatment. The scleritis was now more extensive and the cornea was infiltrated almost throughout its whole extent. I gave pilocarpine daily in doses of one-sixth of a grain for two weeks, and then at intervals of from four to six weeks for seven injections, one each day, and have so continued up to the time of writing. The iodide of potassium and mercury have also been continuously used. The scleritis has traversed the whole ciliary zone up to the point of beginning, but under most favourable conditions—that is, the part first affected has been the most severely attacked and every adjoining part taken in was less severe, till finally, when the disease came again to the inner canthus, it was merely a blush. Moreover, the previously affected parts have kept improving and have never relapsed. In January, 1900, the sclero-keratitis was cured, but there was left a decided corneal haze, interfering very much with vision so that nothing could be read at 20 feet. The treatment was no longer necessary in regard to the scleritis, but it had to be kept up so as to clear up the cornea and thus to restore normal vision. This is being done, and now the vision is $\frac{2}{60}$. The cornea is still clearing up and I fully expect almost or quite normal vision again. There has never been any sign of a return of the disease, and the appearance of the formerly severely inflamed sclera is now normal.

The prognosis regarding this form of sclero-keratitis is gloomy. It is stated in our best text-books that the treatment is at best but palliative; the disease is certain to relapse and continues in this way for years till finally vision is not only impaired or practically lost, but ciliary bulging

¹ A paper read at the thirty-third annual meeting of the Canadian Medical Association held at Ottawa on Sept. 12th, 13th, and 14th, 1900.