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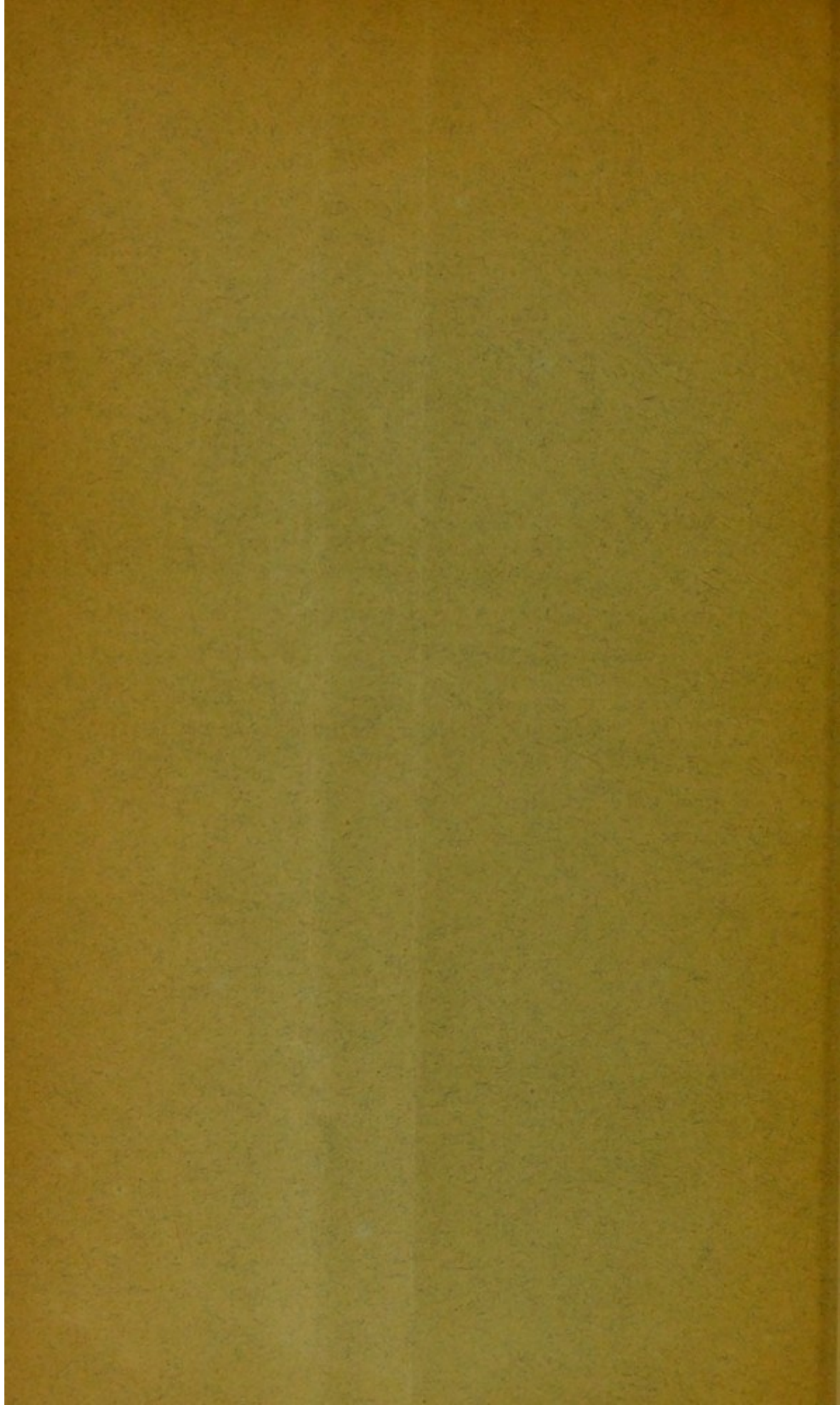
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ANTICHOLERAIC INOCULATION

*during an Outbreak of Cholera in
the Darbhanga Jail, by Surgeon-
Captain E. HAROLD BROWN, M.D.,
I.M.S., Civil Surgeon and Superin-
tendent of the Jail, Darbhanga.*



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CHOLERA AND ITS TREATMENT BY PREVENTIVE INOCULATION IN THE DARBHANGA JAIL.

BY SURGN.-CAPT. E. HAROLD BROWN,

Civil Surgeon of Darbhanga.

DURING a recent severe epidemic in the town of Darbhanga, cholera broke out in the jail. At first limited to an isolated case, the disease became established in a few days—not by the occurrence of several cases in one particular barrack or ward, but by single scattered cases being furnished by every building in occupation.

The cause of the first case was distinctly traced; the affected prisoner, contrary to strict orders on the point, had drunk water from the jail tank, which, on a previous occasion, twenty months ago, had given rise to a mild outbreak of cholera. This water was examined by Surgeon-Captain Green during the recent epidemic and was found teeming with comma bacilli.

No connection could be traced between this case and the subsequent ones; there was no possible

chance of propagation by contact in cases 1 and 2, 2 and 3, or 1 and 3; these prisoners were as far apart as they could be, occupying different wards at night, and being in no way associated during the day. Case No. 1 had been employed in the outside garden; No. 2 had been making string in the B class yard, and No. 3 had been an inside *mehter* in the A class. Case No. 1 occurred on the 31st of March, No. 2 on the 3rd, and No. 3 on the 6th of April. On the evening of the last-named day a fourth case occurred from Ward No. 3, in the B class barracks, and here, again, no connection could be established between that and the previous cases. After this the admissions for cholera became numerous, there being one on the 7th, another on the 8th, and two on the 9th. There were thus eight cases up to the 9th of April; and, of these, the first seven had occurred in as many different wards in the jail. This seemed to clearly indicate not a general contamination of the food or the drinking water, but a dissemination of the poison by some agency in such a manner as to infect separate individuals or localised spots; and this dissemination, as Dr. Macrae of Gaya suggested not long ago, might have been caused by flies which, having come in contact with a cholera evacuation, happened, subsequently, to alight either on a plate of food or a vessel of water, contaminating it.

As so many of the buildings had furnished cases, it seemed probable that there might be a general outburst of the disease at any moment, so it was decided to evacuate the jail, and, on the 10th of April, 172 prisoners were moved into camp twelve miles away, 53 being left behind, these being the sick in the jail hospital, the patients in the cholera huts, with their attendants, the old and infirm and a few cooks and sweepers.

Three fresh cases occurred in camp on the 10th, and one in the jail ; on the 11th, at 2 and 4 A.M., respectively, two further cases were reported in camp, the total number up to date having been 14, of which 10 had proved fatal.

At 7-30 A.M., on the 11th, Professor Haffkine and Dr. Green arrived at the camp and proceeded to make arrangements to inoculate such as were willing to submit to the operation. The prisoners were spoken to on the subject and seemed to be pleased with the idea, the word *tika*, which was familiar to them from its association with small-pox (inoculation), appearing to appeal to them. They were, accordingly, arranged sitting in four rows facing the tent, in front of which Dr. Haffkine was about to commence operations. I was the first subject to be inoculated and, after me, the Jailor, Assistant Jailor, Hospital Assistant, and three Warders. The first prisoner in the front rank was next brought up and submitted cheerfully, after which every alternate man was taken, so that no selection of cases was made until one-half of the total number were inoculated. As each man was finished with, he was taken to a place away from his original position, and, at the conclusion of the operations, there were two distinct bodies of prisoners, the inoculated and the uninoculated, numbering 83 and 81, respectively, and, subsequently, three more were added to the former list, one being an attendant on cholera cases, and two being patients with diarrhoea.

Those who had not been inoculated were far from pleased at having been passed over ; and, to our surprise, they rose, almost to a man, and begged to be inoculated ; nor were they satisfied when told that the medicine was exhausted. This clearly demonstrates the fact that, so far

from compulsion being practised, or being necessary, inoculation was sought voluntarily, and the prisoners who were passed by considered that they were badly treated.

Dr. Haffkine informed me that, instead of using the small dose of emulsion which he had employed on a previous occasion at the Gaya Jail, he would inject a much larger quantity; as much, in fact, as that used by Surgeon-Captain Hare in his recent inoculations in Assam. This would obviate the necessity for reinoculation, and the result, Dr. Haffkine said, would be quicker reaction; and this certainly was the case. My personal experience was pain arising within half an hour of the operation, which steadily increased until it became very severe; fever was present within three hours of inoculation, and the temperature in my own case rose to above 104°F. ; but this was probably due to the fact that I was not able to rest; for, in nearly all the other cases, the highest temperature recorded was 102.5° , which was about the average, all these patients being at rest in bed. Before 4 P.M. that day, every man who had been inoculated was in pain and had fever.

In all probability this rapid reaction meant prompt protection, as succeeding events showed. There were fresh cases of cholera that day at 12 (noon), 6, 6, 7 and 7-30 P.M., and at midnight, all these occurring in those who had *not* been inoculated, and all terminating fatally, despite the greatest care and the most prompt and assiduous treatment.

On the 12th two further cases occurred, both among the uninoculated, and both died, there being thus eight cases in succession, all from the men who were not inoculated and all proving fatal; this showing what a malignant type the disease assumed.

There were no fresh cases on the 13th, and on the following day there were two, both of whom had been inoculated; and both of them recovered. They had been employed as attendants in the cholera tents.

The last case occurred on the 15th, the patient being an inoculated prisoner aged 60, who had had diarrhœa for 30 hours, and who died the following day.

On analysing these numbers we find that, on the 11th, among 86 inoculated prisoners, there were no cases; whereas among 81 uninoculated there were six cases, or 7·4 per cent.; there being six deaths, that is, 100 per cent. of those attacked.

On the 12th there being 87 inoculated prisoners present, no cases occurred among them; whereas among 75 uninoculated, there were two cases, or 2·6 per cent., with two deaths, or a mortality of 100 per cent. among those attacked.

There were no cases on the 13th.

On the 14th, two cases occurred among the inoculated whose strength was 86 or 2·3 per cent., but both cases recovered, the mortality therefore being *nil*.

On the 15th, one case occurred among the inoculated whose strength was 84, or 1·2 per cent., this case proving fatal.

In other words, the result was as follows:—

Inoculated prisoners, 86:—Attacked 3, or 3·5 per cent.;
deaths 1, or 1·2 per cent.
of the original number, and
33·3 of those attacked.

Uninoculated prisoners, 81:—Attacked 8, or 10 per
cent.; deaths 8, or 10
per cent. of the original
number, and 100 per
cent. of those attacked.

The accompanying tabular statement will show the results at the camp.

Number present in the affected group of people.		Date of attack.	Particulars regarding the individual attacked with cholera.				Date of death.
Uninoculated.	Inoculated.		Name.	Age.	Whether uninoculated or inoculated.		
81	86	11th April 1896	Sunder Dosadh ...	40	Not inoculated	11th April 1896	
		Ditto.	Kaila Amat ...	60	Ditto	Ditto	
		Ditto.	Kali Charn ...	25	Ditto	Ditto	
		Ditto.	Mohant Sha...	28	Ditto	Ditto	
		Ditto.	Badri Chamar ...	26	Ditto	12th April 1896	
		Ditto.	Luchman Nunia ...	65	Ditto	11th April 1896	
75	86	12th April 1896	Kirti Dosadh ...	55	Ditto	12th April 1896	
		Ditto	Kular Dosadh ...	40	Ditto	14th April 1896	
70	86	14th April 1896	Voghu Dosadh ...	45	Ditto	Recovered.	
		Ditto.	Fargonah ...	45	Ditto	Recovered.	
66	84	15th April 1894	Raham Ali ...	60	Ditto	18th April 1896	

Date of attack.	Number of uninoculated present in the affected group of people.		Number of inoculated present in the affected group of people.			Particulars regarding the individual attacked with cholera.				Date of death.
	Men.	Women.	Men.	Women.	Children.	Name.	Sex.	Age.	Whether uninoculated or inoculated.	
12th April 1896	25	2	23	1	1	Kalar Dosadh	M	50	Inoculated ...	12th April 1896
13th April 1896	25	2	22	1	1	Kuski Dosadh	M	40	Not inoculated	13th April 1896
14th April 1896	23	2	22	1	1	Golai Dosadh	M	45	Ditto	13th April 1896
15th April 1896	22	2	22	1	1	Tharoo Sonar	M	50	Ditto	14th April 1896
			22	1	1	Puran Gowalah	M	40	Inoculated ...	16th April 1896

On leaving the camp on the morning of the 11th Professor Haffkine and Dr. Green proceeded to Darbhanga, where they inoculated 25 out of 52 prisoners. On the morning of the 12th an inoculated prisoner, who had been an attendant in the observation ward (for diarrhoea), was attacked, and died the same day. On the 13th, an attendant in the cholera hut, uninoculated, was attacked, and died two hours later. On the same day, an uninoculated prisoner who had been under treatment in the jail hospital for dysentery for five days was admitted for cholera, dying the same day.

On the 14th an uninoculated prisoner, an attendant in the observation ward, was attacked and died the same day; and, on the 15th, the last case occurred—an inoculated prisoner who died the following day.

In other words, the result was as follows :—

Inoculated prisoners, 25 :—Attacked 2, or 8 per cent.;
deaths 2, or 8 per cent.
of the original number,
and 100 per cent. of
those attacked.

Uninoculated prisoners, 27 :—Attacked 3, or 11·11 per
cent.; deaths 3, or 11·11
per cent. of original
number, and 100 per
cent. of those at-
tacked.

To summarise the combined results of the camp and the jail we find that of a daily average of 99 non-inoculated there were 11 cases, all fatal, or 11·11 per cent.; of 110 inoculated there were five cases, with three deaths, or 2·73 per cent.

A table showing the results in the jail is appended.

The results above recorded differ from those obtained in the Gaya Jail in one important point, *viz.*, that at the former place the inoculations, as

expected, did not become effective immediately ; whereas, at Darbhanga, the much larger dose of emulsion seemed to have the effect predicted by Dr. Haffkine, for the first eight cases in succession occurred among those who were not protected. As no selection was made among those who were inoculated, cases being taken as they sat, the young and old, strong and weak being taken indiscriminately, it is significant that all these should escape completely, while eight of the other body of men, of the same numerical strength, should suffer so severely.

It is also a striking fact that, at the camp, the only two cases of recovery from cholera after inoculation occurred among the inoculated, while the only death from among the latter was an old, infirm prisoner of 60 who, before being attacked with cholera, had suffered for 30 hours from diarrhœa.

To show further that Dr. Haffkine was anxious to try the effect of inoculation over as wide a range of cases as possible, I would point out that three prisoners suffering from diarrhœa were inoculated, none of these being admitted for cholera subsequently. But I fail to understand why so large a number of attendants suffered, this being contrary to my personal experience in a large number of epidemics. It is most unusual for attendants to contract the disease ; but, in the recent epidemic, three attendants on cholera patients were attacked ; and two others had been at work in the observation ward where cases of diarrhœa were watched and treated.

The type of the disease was extremely malignant, 24 patients dying out of 30, a mortality of 80 per cent. In one case death occurred in an hour and a half from the commencement of symptoms, in another, in two hours, and several

cases terminated fatally in three and four hours.

On one occasion I saw a particularly acute case. A batch of prisoners was returning from a bathing parade, and I happened to be on the spot as they filed into the camp. One of them, a tall, stalwart Burman, suddenly reeled and fell, and I rushed to his assistance thinking he had sun-stroke; on reaching him, however, I found that he had had a profuse motion as he fell, and it was evidently a case of cholera. He died, and Dr. Haffkine removed some of the contents of his small intestine with a pipette and, on inoculating guinea-pigs with it, found that it was extremely virulent.

The facts above noted speak for themselves. It is a pity, however, that Dr. Haffkine was not able to inoculate the prisoners earlier, for some may think that the number of cases recorded is too small to have any statistical value; though I am personally firmly convinced that the inoculations were protective, and that, as more work is done in this direction, the value of Dr. Haffkine's treatment will become more and more evident.
