

collapse therapy by rendering the sputum bacillus-negative, or reducing the number of bacilli, considerably curtails the chances of spread of infection. The drawback to the treatment is that x-ray examination of the cases has to be conducted before and during the course of the inflations. Unless the condition of the collapsed and the healthier lung is closely watched by skiagrams or by fluoroscopy one might be startled by some disastrous results. Deep seated disease in the opposite lung not detected by physical examination might spread and give disappointing results, or a superficial cavity in the lung to be collapsed might get punctured by the dis-pneumothorax needle and produce the disastrous consequences of pulmonary rupture.

One great advantage of the treatment is that it can be conducted in the midst of busy towns and cities with results that compare favourably with those obtained in sanatoria in salubrious climates by the same treatment. The patient will be living all the time under

occurred locally, the last case developing on the 7th September.

The outbreak occurred amongst the Mission workers living at Kalna. The Mission hospital is situated about one mile from the centre of the town, and round about it there are living those who work in the hospital, i.e., doctors, compounders and nurses, and also several teachers—both male and female—who teach in the Mission Schools. In addition to these, there are also several menial servants living in the compound.

Imported Cases.—Unfortunately accurate records were not taken of the five “imported cases.” There is no doubt, however, that they were all suffering from the disease which was at the time so prevalent in Calcutta and other districts. The infected persons came from Gosaba, in the Sunderbans, where the disease was widespread. The following table illustrates the severity of the disease in each case and the relationship of the cases to one another:—

TABLE I.
Imported Cases.

Case No.	Age.	Sex.	Oedema.	Diarrhœa.	Fever.	Dyspnœa.	Pain on pressure.	Knee reflex.	
1	J. M.	35	M	++++	++	+	+++	+++	?
2	J. M.'s wife	34	F	+++	++	+	+++	++	?
3	J. M.'s child	2	F	+++	+	+	++	?	?
4	J. M.'s nephew	5	M	++	—	—	—	—	+
5	S—servant	15	M	++++	++	+	+++	++	—

conditions not very different from those of his domestic surroundings and can adapt himself to his home conditions immediately on the cessation of the treatment.

AN APPARENTLY INFECTIOUS OUT-BREAK OF THE EPIDEMIC DROPSY FORM OF BERIBERI.

By I. R. ANDERSON, M.B., Ch.B.,
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ON 27th July, 1926, J. M. and his family, suffering from epidemic dropsy, came to live at Kalna where, up to that time, there had not been any signs of the disease. They lived in the house of Mrs. M, at “A” in the map for two days, and then went to live with Mrs. K at “B” in the map. On 2nd August S., a servant of J. M., came to Kalna. He was also suffering from epidemic dropsy and was admitted to hospital. He spent a great deal of his time with B. M. at “C” in the map. Meanwhile, on 1st August, Mrs. M developed the signs and symptoms of epidemic dropsy. On 9th August Mrs. K. also developed epidemic dropsy, and B. M. on 12th August. Thereafter, during the following month, numerous other cases of epidemic dropsy

Some of the details of the signs and symptoms of the disease were as follows:—

(1) *Fever.*—Intermittent low fever, the temperature rising to 99° or 100°. The fever did not yield to quinine. Case No. 5, who was under observation in hospital, had fever for about forty days.

(2) *Oedema.*—A continuous firm œdema of the feet and legs, and a transient œdema of the face and hands, that of the face being marked in the morning.

(3) *Dyspnœa.*—There was marked breathlessness both on exertion and at rest.

(4) *Gastro-Intestinal Symptoms.*—Seven or eight loose motions daily. No vomiting. Loss of appetite.

(5) *Pain.*—Pain in the calves of the legs on pressure was marked. In some cases there was a continuous pain. There was also marked muscular weakness.

(6) *Knee Reflex.*—Examined only in two cases.

(7) *Urine.*—Albumen free.

Local Cases.—In all, eighteen cases of the disease occurred locally. On the whole the disease in these cases was of a slightly milder nature, with the exception of case No. 1 who was acutely ill. The severity of the disease was less in the cases occurring late, the

disease in the last five cases being of a very mild type. Table II gives details of the

Case No. 9. This case requires special comment as she died suddenly while suffering

TABLE II.
Local Cases.

Case No.	Oedema.	Diarrhœa.	Fever.	Dyspnœa.	Pain on pressure.	Delayed second cardiac sound.	Knee reflex.
1	++++	+++	+	+++	+++	+	++
2	+++	+++	+	+++	—	+	+
3	+++	+++	—	+++	—	—	—
4	++	—	—	++	++	—	+
5	++	—	—	+	—	—	—
6	+++	—	—	+++	—	—	—
7	+++	+++	—	+++	++	+	+
8	+++	—	+	+++	++	+	—
9	++	++	—	+++	++	?	?
10	+++	++	—	+++	++	+	—
11	+++	—	—	+++	+++	+	—
12	+++	—	—	+++	—	—	—
13	+++	++	—	+++	++	+	—
14	++	++	—	+	—	—	—
15	++	—	—	++	+	—	+
16	++	—	—	+	—	—	+
17	++	—	—	++	++	—	—
18	++	—	—	++	—	—	+

signs and symptoms in each case; while Table III shows the relationship of case to case.

Additional observations are:—

(1) Fever was recorded only in three cases. The fever of Case No. 2 appears to have been malaria.

(2) Oedema was the special feature of every case, the first to appear and the last to disappear.

(3) Knee reflexes varied, sometimes being quite absent but normal a few days later, and vice versa. Absence of reflexes is recorded in all cases in which it was found at any time.

(4) The urine was in all cases albumen free.

(5) A delayed second cardiac sound was observed in a number of cases. Some cases complained of palpitation.

Course of the Disease.—The disease was not a disabling one. Several cases were confined to bed for a few days, but the majority recovered in three weeks without any change in diet.

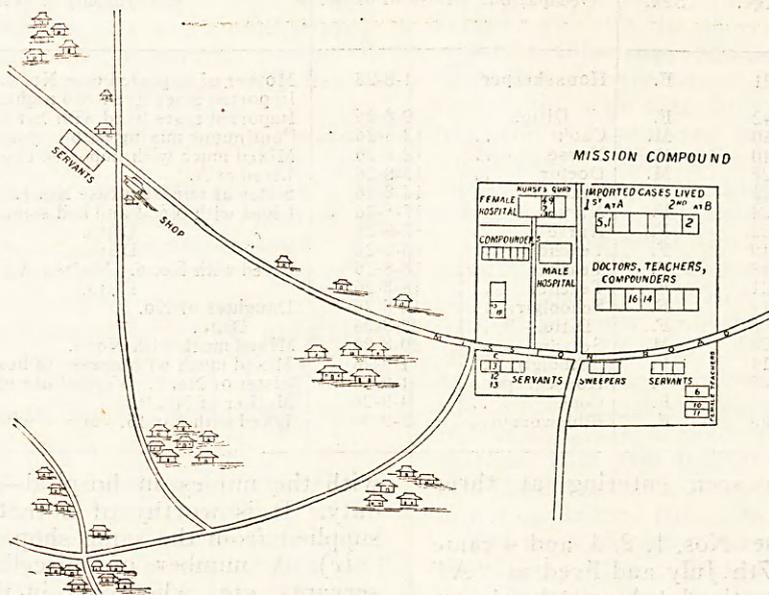
Case No. 1 was the most serious. In spite of three weeks holiday in September, she returned to Kalna on account of her illness. Latterly she had blurring of the vision, due probably to a toxic paresis of the iris muscle. She ultimately recovered on 14th October.

Treatment.—Very few cases required treatment, the disease being accepted by the people as one which got better of itself. Four of the cases required to be admitted to hospital. With absolute rest, daily injections of adrenalin, and a mixture containing digitalis and iodides, they made a slow recovery.

from beriberi. On 2nd September, 1926, at 5 p.m. she complained of palpitation, and an assistant, finding her heart very fast, prescribed a sedative mixture. She did not complain of beriberi then. Till 9 p.m. she was well and then went to bed. I was called at 1-30 a.m. and arrived to find that she had just died. Before her death she had vomited twice and she had had increasing difficulty in respiration. Previously she had been a healthy girl of nineteen, and there was no apparent reason why she should thus die suddenly. On investigation it was found that she had been suffering from beriberi for about fifteen days. From the description of those who were with her before her death we are inclined to think that she died from œdema of the lungs. Post-mortem examination was not made, but the froth at the mouth and nose at the time of death, and a continual watery discharge from the nose and mouth till she was buried twelve hours later, also suggest œdema of the lungs as the cause of death.

Rice Supply.—We made a careful investigation of the rice supply. The map illustrates the area in which the Mission compound is situated. There is one shop in this area, and from it most of the people living in the Mission compound and round about obtain their rice. The majority of the customers buy small quantities of rice at a time. Some eat milled rice only, some home-prepared rice, while others, who are not particular, sometimes eat one and sometimes the other. The whole stock of rice kept in the shop is five or six bags and this is sold out in about ten days; the stock being renewed about every tenth day. All this rice is bought locally from

the rice merchants in Kalna. Throughout Kalna are numerous other such shops, all close to the Mission. On investigation, we found that there was no period in July and



drawing their rice supply from the same sources.

Discussion.—This outbreak occurred exclusively amongst the Mission workers at Kalna. It was a small outbreak relatively and, on this account, detailed observations could be made.

In view of the fact that the theory of infected rice as the cause of epidemic dropsy holds the field at the present time, we naturally made a careful investigation of the rice supply in order to see if it had any connection with the incidence of the disease, and if so, what factors there were which limited the size of the epidemic. Obviously, there was no widespread infection of rice in this district, as no casts except those reported were sent to us or heard of at the time. In the town of Kalna itself (population 8,000) not a single case occurred. On the 6th September, three cases of epidemic dropsy came from a village sixteen miles away in district Nadia. They reported that there was an outbreak there. The people of Kalna buy their rice from small shops which, in turn, buy rice from the rice merchants in Kalna, that is from the same source as the rice supplied to the Mission workers at Kalna.

One might presume that only a limited amount of rice was infected and, being bought by some of the Mission workers, the disease occurred amongst them. In this outbreak, there were persons of nine households who developed epidemic dropsy. These nine households all bought their rice from the one shop. The same shop supplied rice to sixty households altogether; of these thirty are within the Mission and thirty outside, but

August when only infected persons bought rice. Some of those who suffered from the disease were supplied only with home-prepared rice, some with milled rice, and some with both. Of those who were not affected the same facts can be recorded. We see, therefore, that there was no general infection of the rice sold at the shop.

Again, one may presume that only one bag of rice was affected and by some unlucky chance this rice was supplied to the Mission customers. Our investigations prove however that this was not possible, as there was no period during which these nine households alone were supplied in close succession. This supposition is also disproved by two other facts: (1) the rice supply lasted for ten days, yet fresh cases occurred long after that rice supply should have all been sold; (2) case No. 18 had been on holiday and arrived on Kalna on 4th September. She developed the disease on 7th September. The rice supply of this household had been renewed but a few days previously. This investigation effectively disposes of the theory of infected rice as being the cause of the disease in this outbreak. We failed to find any connection between the rice supply and the incidence of the disease. Our observations tend rather to disprove this theory.

The really striking points about this outbreak are these two facts: (1) that the outbreak occurred within a few days of the arrival in Kalna of people suffering from the disease, and (2) that there are definite indications of a person-to-person infection through the whole series of cases. (See Table III.)

TABLE III.

Household.	Case No.	Age.	Sex.	Occupation.	Date of onset.	Relationship to other cases.
A.	1	21	F.	Housekeeper	1-8-26	Mother of imported case No. 4.
B.	2	42	F.	Ditto.	9-8-26	Imported cases lived two nights at A.
C.	3	50	M.	Cook ..	12-8-26	Imported cases lived with her at B.
D.	4	40	F.	Nurse ..	12-8-26	Continuous mixing with imported case No. 5.
A.	5	28	M.	Doctor ..	15-8-26	Mixed much with imported cases and with No. 1.
E.	6	23	F.	Teacher ..	15-8-26	Lived at A.
D.	7	24	F.	Nurse ..	17-8-26	Sister of imported case No. 1. Visited A often.
D.	8	22	F.	Nurse ..	17-8-26	Lived with No. 4 and had same relationships.
F.	9	19	F.	Teacher ..	18-8-26	Ditto.
E.	10	19	F.	Teacher ..	18-8-26	Ditto.
E.	11	21	F.	Teacher ..	18-8-26	Lived with No. 6. Visited A often.
C.	12	11	F.	Schoolgirl ..	18-8-26	Ditto.
C.	13	8	F.	Ditto. ..	20-8-26	Daughter of No. 3.
G.	14	28	M.	Servant ..	20-8-26	Ditto.
H.	15	14	F.	Schoolgirl ..	1-9-26	Mixed much with No. 3.
I.	16	25	F.	Housekeeper ..	1-9-26	Mixed much with nurses in hospital.
F.	17	55	F.	Cook ..	4-9-26	Sister of No. 9. Visited her often.
H.	18	55	F.	Biblewoman..	7-9-26	Mother of No. 9. Lived with No. 15. Mixed with nurses much.

The infection is seen entering at three points:—

I. Imported cases Nos. 1, 2, 3 and 4 came to Kalna on the 27th July and lived at "A" for two nights. On the 1st August local case No. 1, living at "A," developed signs of beriberi.

II. On the 29th July imported cases Nos. 1, 2 and 3 went to live at "B." On the 9th August local case No. 2 occurred at "B."

III. On the 2nd August imported case No. 5 arrived in Kalna and was admitted to hospital. He spent a great deal of his time with local case No. 3, who developed beriberi on 12th August.

From these three points of entry we can trace two lines of person-to-person infection amongst the people infected:

1. Cases Nos. 1 and 2 were both females and from them the disease is seen spreading through the women in the Mission compound. Not all the women in the compound were affected—only those who mixed much with infected cases. In this line of infection is found one male, case No. 5, who was living at "A." He was away for the two nights when the imported cases lived at "A," but imported case No. 1 occupied his bed for these two nights.

2. Case No. 3 developed the disease on 12th August. His two daughters Nos. 12 and 13 developed it on 18th and 20th August respectively, and then case No. 14, with whom there was contact, also on 20th August.

A great deal could be written about the contact of case with case. A study of Table III and the map however will show how the cases were connected.

More important is it to point out how, when there was no close contact with infected people, cases did not occur:

(a) The sweepers were separate—no beriberi.

(b) One female nurse did not have beriberi. She lives at her father's house—not

with the nurses in hospital—and comes for duty. It is worthy of note that her rice is supplied from the same shop.

(c) A number of miscellaneous people, servants, etc., who work in the Mission but live outside did not develop the disease.

(d) Male teachers and compounders did not develop the disease. They had no contact with the women nor with the other line of cases. Case No. 3 however cooked for several of them, but there was no contact between him and those for whom he cooked, as he placed the food on dishes with a ladle after cooking it.

On the other hand there were a number of persons whom we would have expected to have become infected with the disease but who did not become infected. We record below under the different cases instances of people who were in close contact with cases, but did not develop epidemic dropsy.

Case No. 1. Her husband and daughter did not develop the disease. The former was himself a patient in hospital for the first month of the two and a half months of his wife's illness, but she visited him often.

Cases Nos. 3, 12 and 13. The wife of case No. 3 and mother of cases Nos. 12 and 13 did not contract the disease.

Case No. 14. The wife of this case was not infected.

Cases Nos. 15 and 18. A Biblewoman who lived with these cases remained free of the disease.

Case No. 16. Her husband did not develop the disease.

Imported case No. 3. A compounder was a special friend of this case but remained free of the disease.

SUMMARY.

The article describes a small localised outbreak of epidemic dropsy which has several striking features:

(1) The outbreak occurred in a place where previously there had been no sign of the disease.

(2) It followed immediately on the arrival of people suffering from epidemic dropsy.

(3) There was no apparent connection between the rice supply and the incidence of the disease.

(4) There was evidence of a person-to-person infection.

(5) Instances of non-occurrence of the disease where it might have been expected to occur, if it were infectious are recorded.

TWO FORMS OF INFECTION OF THE KIDNEY.

By SIR JAMES R. ROBERTS, C.I.E., M.B., M.S.,
F.R.C.S. (Eng.), I.M.S. (Retd.).

Staphylococcal Infection and Perinephritic Abscess.—This has a direct relation to an attack of boils, and is an infarct of the cortical portion of a lobule or adjacent lobules and does not affect the apical portion. The immediate portion of the lobule under the capsule becomes the seat of a small abscess which burrows into the perinephritic tissue, and a large abscess results. This then is the most common cause of perinephritic abscess: less common causes are stone and guinea-worm, but these are more chronic in their development. This staphylococcal abscess is not necessarily associated with pus and blood in the urine, as it is likely to be shut off from the rest of the renal tissue. We see many cases of abscess in the cellular planes of the body following boils, and this infection of the cortex of the kidney is another example. The symptoms are rigors and fever of an acute type with pain in the loin, and subsequently a large swelling or tumour to be felt in the loin. It is important to diagnose the condition in an early stage remembering its association with boils and to open the abscess early, before too serious injury has been produced and before the general health is gravely involved. Pressure upon the lumbar plexus produces pain in more distant parts and adds some obscurity; hence it is well to remember this point. *Treatment* by incision and drainage requires no special description.

Bacillus Coli Infection.—There are two forms, the acute and the subacute, which latter passes into a chronic infection. The acute is rare, in fact very rare. It is an intense infection of one kidney with hæmorrhagic infarcts and general congestion and inflammatory œdema of the kidney tissue. This gives rise to marked hæmaturia. The important aspect of such a case is the sudden onset with rigors and the patient is brought from normal health in a few hours or a day to a condition bordering on death. The

collapse is intense; the fever is high; vomiting is present; with great pain in the loin: enlargement of the kidney is to be felt unless the patient is obese, and there is the hæmaturia to guide in the diagnosis.

How is this acute condition to be dealt with? Either by the treatment given to a subacute case in the hope that the patient may be tided over the crisis and the acute inflammation of the kidney subside to a chronic one, or *immediate excision* of the kidney has to be most seriously considered, in spite of the collapse, as there is not much time available before the patient succumbs. However, these cases are so rare that a practitioner of long experience may never meet with such a condition.

Subacute Bacillus coli Infection.—Here again one kidney is attacked. The onset of the subacute type is fairly rapid, is apt to follow exposure to cold; rigors and fever are marked, with pain and tenderness in one loin, and the hæmaturia at once directs the attention to a kidney condition. In fact it is one of the more common causes of hæmaturia of the kidney type. Nausea and vomiting are present with the usual symptoms of severe illness on tongue, bowels, appetite, etc. An examination of the urine for *Bacillus coli* will give further information and decide the diagnosis. The infection attacks the apical portions of the lobules and the pelvis of the kidney, and not the cortex.

The recognition of this infection, in order that the treatment shall prevent the disease becoming chronic and intractable, is most important, as in this subacute condition treatment is successful, except perhaps in those past middle life. The essence of the treatment is to produce alkalinity of the urine as quickly as possible by large doses of citrate of potash, one drachm every four hours or every three hours, and the testing of each portion of urine passed with litmus paper so that when alkalinity has been obtained the doses of citrate of potash can be reduced sufficiently to maintain this condition. We all know that the *Bacillus coli* does not grow in alkaline media. Hot fomentations to the loin must be assiduously applied and the bowels evacuated at once by castor oil if the nausea or vomiting will allow of this; if not by calomel and salines. A most important point is that the patient must remain in bed for three weeks at least with continuous treatment, otherwise the infection will become chronic. One may say that had all cases been treated in the early stage, we should see few chronic ones. Rest is most essential. Naturally a bland diet has to be ordered, as in all cases of nephritis.

Chronic Bacillus coli Infection. This condition is so common in India and is the cause of the wrecking of so many important lives that it is time we should be able to effect a cure with the advance of medical science.