that the immunity mechanism was in a state of continuous irritability. Perhaps this may be the condition quite frequently when patients do not improve under vaccine treatment, and yet suffer no obvious reaction. So greatly was I impressed with the value of peptone injections, that it seemed possible that here might be a solution of the problem one often has to deal with—namely, that of the patient who can only come for three weeks' or a month's treatment, and then has to return to her own doctor to have her vaccines, and who for financial reasons will certainly not be able to return if the treatment does not succeed. The following case illustrates this. I started straight away with peptone injections, so as to prevent the development of sensitiveness. After returning home the patient's own doctor was able to carry on the treatment without difficulty.

CASE IV.

On June 28th, 1922, I saw in consultation a case of general and severe arthritis, chiefly affecting the knee-joint, in a woman aged 48. She had not been out of bed for four months and was quite unable to walk, but happily there were no contractures. The knee-joints were at the time the worst parts, but practically every joint with the exception of the spine was affected.

Owing to financial and other reasons, it was impossible for the patient to come under my care except for a very short time. However, with only eight days to work upon, I started at once, on July 1st, with 0.1 c.cm. of a 2 per cent. solution of peptone. On July 3rd 0.2 c.cm. was given, on July 4th 0.4 c.cm., on July 5th 0.8 c.cm., on July 6th 1.4 c.cm., and on July 7th 1.4 c.cm., which I combined with half a million *M. deformans*. At the same time I had a bad tooth removed and cultured, and examined the faeces. There were nine varieties of streptococci at the apex of the tooth, and six varieties in the faeces. These were combined in one vaccine, and her doctor carried on with small doses, beginning with half a million combined streptococci and *M. deformans*. On September 29th much stronger doses were required. There have never been any severe reactions and the patient is improving.

Method of Preparing Peptone.

Normal saline prepared from distilled water plus 1 per cent. carbolic acid is autoclaved in a flask at 120° C. for twenty minutes with a funnel fitted with rubber tubing and a clip. Vaccine bottles and caps are also sterilized. Ten per cent. of Armour's peptone is added to the hot carbolized saline and shaken up. The vaccine bottles are filled with the aid of the sterile funnel, capped and wired. After forty-eight hours a sample is removed and tested for sterility. When proved sterile, 1 and 2 per cent. solutions are put up in vaccine bottles already fitted with the requisite amount of 0.5 per cent. carbolized saline.

Method of Dosage.

I have tried a good many different series of peptone doses, and find that for all intents and purposes the following method results in a fairly complete and satisfactory desensitization.

On the first day 0.1 c.cm. of a 1 per cent. dilution of peptone; on the second day 0.2 c.cm. of a 2 per cent. dilution; on the third day 0.4 c.cm. of a 2 per cent. dilution; on the fifth day 0.8 c.cm. of a 2 per cent. dilution; and on the seventh day 1.4 c.cm. of a 2 per cent. dilution; and thereafter, at three- or four-day intervals, 1.8 c.cm. two or three times. Having arrived at 1.4 c.cm., a subcutaneous dose of vaccine can be given at the same time, and this dose may be rather larger than the one the patient was sensitive to before treatment. No reaction will occur.

Indications for Peptone Treatment as an aid to Vaccine Therapy.

From what has gone before, it will be clear that as soon as it is definitely determined that a patient is excessively sensitive to vaccines a course of peptone should be started without waste of further time; and secondly, if the patient is likely to be sensitive (and only experience, of course, can tell us when that will be) and can only give a very short time to special treatment, it is advisable to give a course of peptone before the vaccines are started.

Contraindications.

Provided the proper form of peptone is used (Armour's No. 2 peptone, as recommended by Dr. Auld), there are very few contraindications to the use of the drug intravenously.

A few people seem to be unable to tolerate it, and after as small a dose as 0.4 c.cm. of a 2 per cent. solution complain of nausea and occasionally cardiac distress at night. In cases like this I have not pursued the treatment.

I should not give peptone to cases of grave anaemia or other serious constitutional diseases. The most important contraindication seems to be the presence of albumin in the urine, and especially any history of chronic or acute nephritis. In three cases I have seen recrudescence of nephritis which I think might be ascribed to the injections of peptone. On ceasing treatment, however, the symptoms have disappeared.

Summary.

A good many cases of infections by streptococci and *M. deformans*, particularly in the arthritic group, become so sensitive to vaccines that treatment is very difficult and tedious. It is in these cases that intravenous peptone will do away with the sensitive condition, and enable treatment to be renewed.

Peptone provides the best method of overcoming the difficulty of sensitiveness in vaccine treatment.

In cases where sensitiveness is likely to occur peptone can be given as an initial course before vaccines are started.

The contraindications to the treatment are personal intolerance, grave anaemia, severe illness, and chronic nephritis.

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CARBON TETRACHLORIDE AND OIL OF CHENOPodium IN HELMINTHIASIS.

BY

J. G. REED, M.R.C.S., L.R.C.P.,

DIVISIONAL MEDICAL OFFICER, SARAWAK CIVIL SERVICE, BORNEO.

AN article appeared in the *BRITISH MEDICAL JOURNAL* of July 1st, 1922, reporting favourably on the use of carbon tetrachloride for hookworm infection. The drug also expelled *Oxyuris vermicularis* in large numbers and some *Trichuris trichiura* and *Ascaris lumbricoides*. The drug acts as a moderate purge and it is not necessary to prepare the patients as for thymol treatment. Oil of chenopodium is soluble in carbon tetrachloride, and a mixture of the two was suggested for ascariis infection. Since then several other articles have appeared on the subject.

Treatment with the drug was commenced in the General Hospital, Kuching, in August, 1922, and the immediate results warranted its continuance. It has been given to 82 patients in the hospital. It has been given also to several school children and to one European; the results from the former have been very good, but they have not yet been tabulated as it is hoped to examine the faeces of all the school children in the near future, and to give treatment to those who require it. The European patient showed no ova in his faeces after one dose of m 60, and during the six weeks following he gained 5 lb. in weight.

The faeces of the majority of patients in the General Hospital, including all those who showed any signs of hookworm infection, have been examined in the pathological department. The films have been made direct from the faeces; three slides have been examined before the specimen has been considered to be free from ova, and, wherever possible, two such examinations have been made before the patient has been pronounced free from worms. Of course it is realized that such methods are not absolute—a fact which in a few cases has been demonstrated by post-mortem examination.

It has been found that carbon tetrachloride alone is a fairly efficient anthelmintic for ascariis, but in combination with oil of chenopodium it has a much higher efficiency and practically never fails. This combination is believed

to be somewhat more effective than carbon tetrachloride alone for a pure hookworm infection also. Doses up to 1 drachm of carbon tetrachloride alone are being given to adults. Formerly $\frac{1}{80}$ were frequently given, but cases that were resistant to 1 drachm were usually found to be equally resistant to the larger dose. The dose is given first thing in the morning before eating, and no purge is given.

After trying various combinations the following standard treatment is given to adults: one ounce of castor oil is given at night, and the next morning a mixture containing 1 drachm of carbon tetrachloride, 1 c.cm. of oil of chenopodium, and $\frac{1}{2}$ oz. of liquid paraffin. As a rule the faeces are examined again a week to ten days after treatment, and if necessary the treatment is repeated. The immediate effect on the patients does not seem to be any more marked when this mixture is used than when the carbon tetrachloride is given alone. Almost all the patients complain of feeling drunk for a time varying from a few minutes to a day. As a rule three or four motions are produced in the twenty-four hours following the treatment, and these often contain numerous worms (ascaris). Occasionally slight vomiting, headache, or pain in the abdomen occur.

The treatment has been given to Chinese, Dyaks, Tamils, and one Japanese, and the series of 84 cases contains one European and one Chinese schoolboy who were not in the General Hospital. Almost all the Dyaks examined have been found to harbour ascaris, and a large percentage hookworms also. In spite of this fact, almost all the very heavily infected cases, exhibiting extreme anaemia, oedema, and debility, occur in Chinese, and no death from ankylostomiasis can be recollected among the Dyaks at the General Hospital. The Chinese also appear to be somewhat more resistant to treatment. The results as regards actual clinical improvement among the heavily infected Chinese have been somewhat disappointing. In several the stools have been reported free from ova after treatment, and the patient has left the hospital without oedema and feeling much stronger, though probably with still a high degree of anaemia; only to return shortly afterwards with oedema again, though the faeces still show no ova. In many cases a weekly haemoglobin test by the Tallqvist method was made, but few showed a rapid or extensive rise. Many cases of this nature were heavy opium smokers. All cases were given *mistura ferri arsenicalis*, and many showed an immediate, rapid, and apparently permanent improvement, in contrast to the type of case mentioned above.

The drug appears to have no effect against *Trichocephalus dispar* and *Strongyloides stercoralis*, and specimens containing ova or embryos of these worms only, have been counted as negative. The drug has been given to patients with fever from various causes and has also been given in conjunction with courses of novarsenobillon and emetine injections, without ill results. In a few cases a full dose has been given on two alternate mornings. This caused no ill effects but did not apparently increase the anthelmintic power of the drug. The majority of the hookworms were of the species *Necator*.

In 35 out of the 84 patients treated two negative examinations of the faeces were obtained after treatment, and in 17 one only. In 26 instances the patients received several treatments, but still showed ova in the faeces or left the hospital before treatment was completed.* Six patients died; they were as follows:

Case 1.—A Chinese, aged 54, was admitted on March 14th, 1922, with a heavy hookworm infection. He received in all 8 c.cm. of oil of chenopodium and 140 grains of thymol. Ova of hookworms were still reported very numerous. On September 1st he received $\frac{1}{60}$ of carbon tetrachloride; on September 8th ova of hookworms and ascaris were reported as scanty. On September 15th he died. The necropsy revealed oedema of lungs and purulent bronchitis with numerous hookworms and trichocephalus in the intestines.

Case 2.—A Chinese, aged 38, was admitted on August 14th, 1922, with a heavy hookworm infection and a mild ascaris infection. He had marked ascites and cirrhosis of the liver. The abdomen was tapped ten times. He received three doses $\frac{1}{60}$ of carbon tetrachloride, after which scanty ova of hookworms and

embryos of *Strongyloides stercoralis* were reported. On November 20th he died. The necropsy revealed typical cirrhosis of the liver of the alcoholic type and a few hookworms in the small intestine.

Case 3.—A Chinese woman, aged 26, was admitted on October 16th, 1922, with a heavy infection of hookworms and amoebic dysentery. The haemoglobin index by the Tallqvist method was 30 per cent., and later fell to 10 per cent. The dysentery cleared up under emetine, and she received three doses $\frac{1}{60}$ of carbon tetrachloride, after which on one occasion no ova were found in the faeces. She was intolerant of any form of control and frequently left the hospital and returned. On February 1st, 1923, she died with diarrhoea and ascites. At the *post-mortem* examination about twenty hookworms were found in the small intestine.

Case 4.—A Tamil, aged 38, admitted November 13th, 1922. He harboured ankylostomes, ascaris, and *Trichocephalus dispar*. He received $\frac{1}{2}$ c.cm. of oil of chenopodium with $\frac{1}{60}$ of carbon tetrachloride. He then left the hospital, but returned on December 25th, his faeces showing ova of *Trichocephalus dispar* and hookworms, both very scanty. On January 29th, 1923, he died. The necropsy showed pyopneumothorax. No worms were found in the intestines.

Case 5.—A Chinese, aged 34, admitted on November 22nd, 1922, with subtertian malaria and an infection of hookworms. The malaria responded to quinine treatment, and on November 29th he received $\frac{1}{80}$ of carbon tetrachloride. On December 5th he became mentally deranged, and later violent, so that he was removed from the hospital. On February 19th, 1923, he died of amoebic dysentery. The intestines were not examined for worms.

Case 6.—A Chinese, aged 64, admitted on December 7th, 1922, with epithelioma of the external auditory meatus. He also harboured hookworms, ascaris, with which he was heavily infected, and *Trichocephalus dispar*. He was later found to be suffering from quartan malaria and developed amoebic dysentery. He received 1 c.cm. of oil of chenopodium in a mixture with $\frac{1}{45}$ of carbon tetrachloride; after this no ova were found in his faeces. He died on December 27th. At the necropsy about six hookworms were found in the small intestine and numerous *Trichocephalus dispar* in the large. There were no ascaris. Macroscopically the heart and liver did not appear to be fatty.

I wish to express my indebtedness to Miss E. J. O'Driscoll, under whose supervision all the faeces examinations were carried out, and who made suggestions as to dosage. I also wish to thank Mr. W. E. le Gros Clark, Principal Medical Officer of Sarawak, for permission to publish the cases.

AN EXTREME CASE OF DIFFUSE SYPHILITIC FIBROSIS OF THE LUNGS.

BY

F. PARKES WEBER, M.A., M.D., F.R.C.P.

In the work on *Fibroid Diseases of the Lung*, by Sir Andrew Clark, Dr. W. J. Hadley, and Dr. Arnold Chaplin (London, 1894, p. 84), it is stated that "syphilis is undoubtedly, etiologically, concerned in fibroid disease; but it is with extreme rarity that cases capable of being ascribed to this cause are to be met with." It is further stated that most syphilitic cases take "the form of patches of gummatous material with induration around them. In some few cases a diffused form is met with, much resembling pure fibroid disease."

It is of this diffused form that the following case is a most remarkable example.

The patient, a man aged 53 years, was admitted to the German Hospital on March 28th, 1923, under the care of my colleague, Dr. E. Schwarz. I saw him later during the temporary absence of Dr. Schwarz, by whose kindness I am permitted to publish the case. On admission the patient was thin and emaciated-looking, with dyspnoea and an extreme degree of "clubbed fingers." There was no fever. The history was that he had had a chancre twenty years ago, and that his wife had had three or four miscarriages. He had had influenza in 1918, but had otherwise enjoyed fairly good health until about six months ago, when he commenced to suffer from shortness of breath. His wife thought he had been ill for a somewhat longer time. In the hospital, besides the dyspnoea and clubbed fingers, the chief sign was extreme dullness to percussion over the upper parts of both lungs, especially in the supraclavicular regions, and at the back, from the apices down to the middle of the scapulae, with breath sounds of vesiculo-bronchial type. At one part of the left back slight cavernous breathing was heard; over the bases there were some pleuritic sounds. The cardiac dullness was increased to left and right, and there was an accentuated pulmonary second sound. There was apparently no enlargement of the spleen or liver. The urine was free from albumin and sugar.

At first the case appeared to be one of chronic pulmonary fibrosis of tuberculous origin, with dilatation and hypertrophy of the right

* The clinical reports of these cases have been omitted owing to pressure on space.