conversion into percentiles were compared with the percentile scores of 312 unselected recruits who were uninfested.

There was a marked difference in the scores of the two groups, the lowest scores in all three tests being found in the infested group, suggesting that pediculosis capitis is more prevalent among the less intelligent recruits.

I wish to thank A.S.O. Comley, W.A.A.F., and Corporal (now Sergeant) Minnitt, W.A.A.F., for their very valuable assistance.

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TREATMENT OF MALARIA IN ENGLAND

BY

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The manifestations of malaria as seen in England are almost protean in appearance and character, so it is probable that many cases are overlooked. In particular this is true of the subtertian, in which the classical periodicity is not always to be found and which may indeed show no fever. Most of the cases seen in England are probably examples of relapse, because patients generally have resorted to some antimalarial drug with the onset of the primary fever in the Tropics. Frequently, however, the dosage which they use is so inadequate that return to a colder climate precipitates an attack.

During a period of a little more than 18 months there have come under observation and treatment at the Seamen's Hospital 60 cases of malaria in which the diagnosis has been confirmed by finding parasites in blood films. The numbers may appear trifling to those who are accustomed to this infection in regions where it is indigenous, but to English practitioners they may seem formidable. In the course of diagnosis and treatment some problems have appeared, but with few exceptions it has proved possible to adhere to a standardized procedure. Certain variations, both in the nature and in the length of treatment, have been unavoidable as a result of exigencies of war, but the main therapeutic scheme has been similar in 57 cases of subtertian malaria. The overwhelming preponderance of subtertian infection was natural, since most of the patients had been infected in Freetown, Sierra Leone, where other species of malaria are almost unknown. In 40 a history of previous quinine therapy was obtained, but, as many of the patients were foreigners and the language difficulty sometimes did not permit of an accurate and detailed statement, it was not always possible to find out whether quinine had been taken prophylactically or therapeutically. Previous quinine therapy had undoubtedly modified the clinical picture very greatly and increased the difficulties of diagnosis. One patient at least, dissatisfied with delay while the diagnosis was being established, continued to take quinine surreptitiously while in hospital, thus rendering the difficulty even greater.

Diagnosis

Throughout the period under review it has been considered essential to demonstrate malaria parasites in the blood film before starting specific therapy, but in order not to overburden the pathological service an attempt has always been made to establish a clinical probability before calling in laboratory aid. Of the patients 44 had fever at the time of admission, while 24 complained either of shivering attacks or of malaria, and in these cases the probability was considered to be sufficiently great to justify blood examination; but during the same period more than 40 men were admitted diagnosed wrongly as cases of malaria either on their own initiative or by the masters of their ships, and among the various causes of symptoms "influenza," bronchitis, cystitis, and tuberculosis were found to be the most important in order of frequency. Any patient who develops a fever after recently returning from the Tropics is, of course, to be suspected of malaria, but it is

just as important to recognize the multitude of other febrile conditions which may be present as it is to diagnose malaria correctly when it is present. In any suspicious case blood films must be examined on more than one occasion, and the blood should preferably be taken when the fever is at its highest. The use of a preliminary injection of adrenaline half an hour before the taking of blood films is referred to later. The character of the fever was not found very helpful, and only two cases remained undiagnosed for long enough to reveal tertian periodicity.

Among the more baffling symptoms generalized aching pain in the limbs was described in 4 cases, abdominal symptoms in 3—one of which cases was admitted as an acute abdominal emergency and one on account of bloody diarrhoea—and 10 gave headache as their main complaint. One patient was admitted unconscious, with high fever. Cerebral malaria was promptly diagnosed, since it is an established custom to regard all pyrexial comatose patients as suffering from malaria until some alternative diagnosis is established. In 43 the spleen was palpable, but in only 5 was more than a 2-finger enlargement recorded, while in a certain number of cases the organ could be felt only by deep subcostal palpation with the patient lying on his right side. Considerable practice is necessary to detect lesser degrees of splenic enlargement, and it is slight splenomegaly which is most likely to help in diagnosis of doubtful cases. Anaemia of varying degree was present in almost every case, but haemoglobin estimations were made only in those cases in which, on clinical grounds, a severe depression was anticipated. Out of 22 cases in which the haemoglobin was determined 17 gave values below 70%.

The blood examinations for parasites were carried out by Dr. Arthur Davies; he recorded malignant tertian rings alone in 39 cases, rings and crescents in 13, and crescents only in 5 cases. Benign tertian parasites were found in 2 cases and quartan malaria in a single instance. One of the benign tertian patients had apparently been infected either in South America or in Panama, while the other had spent some years in India although he had been for a few weeks in Freetown also. The quartan infection apparently originated in the Philippines. Out of 60 cases in the series, parasites were found at the first examination in 42 and at the second examination in 13, while in the remainder multiple examinations were necessary. In 2 cases parasites were discovered only in films taken after the injection of adrenaline, given as a simple subcutaneous injection, usually before the second examination. The intravenous technique of Ascoli was not employed.

Treatment

The benign tertian and quartan infections were treated with quinine only. The subtertian infections were treated with a combination of mepacrine (atebrin) and quinine, pamaquin (plasmoquine) being given subsequently to those patients in whom the sexual forms of the parasite had been found. In all cases two equal courses of mepacrine 0.1 g. t.d.s. combined with quinine in varying dosage were given, while in the intervening period quinine alone was used. The original course lasted 15 days, but later the course was extended to 21 days: throughout the series, however, it was divided into three equal periods—two of mepacrine and quinine together and one of quinine alone. In the original course quinine 10 gr. t.d.s. was given, but this was subsequently reduced to 5 gr. b.d. without any adverse effect on the therapeutic result being noted. The total dosage now given in 21 days is 4.2 g. of mepacrine and 210 gr. of quinine. The course is therefore now as follows:

First week: Mepacrine 0.1 g. t.d.s.; quinine 5 gr. b.d.

Second week: Quinine 5 gr. b.d.

Third week: Mepacrine 0.1 g. t.d.s.; quinine 5 gr. b.d.

After completion of the above course pamaquin was added in cases in which crescents were present.

The considerable total dosage of drugs was regarded as justified when treating patients in England, where there is no danger of reinfection and where the number under treatment is inevitably so small. No case of quinine sensitivity was encountered, and only 4 developed yellow mepacrine pigmentation. Of these, 3 were but slightly tinged; but the fourth patient, who had been certified as fit for duty, was sent back with a pointed letter about the fitness of "jaundiced" patients.

Fortunately, mepacrine pigmentation scarcely ever tints the conjunctivae, so that differential diagnosis is easy.

The dosage of pamaquin was 0.01 g. t.d.s. for 3 to 5 days. It was given alone subsequent to the routine course. All patients received adequate therapeutic doses of iron.

In a few who were seriously ill on admission, including the cerebral malaria case, intramuscular quinine was injected with dramatic results, but it was never necessary to give more than two doses. The injections are painful and may give rise to necrosis, but they are not often necessary in this country. Since this series was concluded a trial has been made of an almost painless quinine solution, but its therapeutic activity seems to be far below that of the oral course which has here been described.

Results

The clinical results have been most gratifying and there have been no deaths in the series. All the patients were in good health when discharged, none has returned with a recurrence, and we have had no inquiries from other hospitals for clinical notes of these patients. However, sailors are nomadic persons, and it may well be that relapses have indeed occurred.

In the 44 patients who had fever on admission defervescence occurred on an average less than 24 hours from starting treatment, and the longest time fever persisted was 72 hours, in two cases only. The average stay in hospital was 27 days, but in most cases a part of this time was spent at our convalescent home, and some of the patients required treatment for other conditions. If the length of detention should require further justification, it may be found in the imperative need to restore seamen to complete health before permitting them to return to their arduous duties, and, finally, in the need to restore their haemoglobin to normal level.

Summary

A series of 60 cases of malaria, of which 57 were subtertian, is described.

Clinical examination has shown that neither fever nor splenomegaly can always be relied upon to suggest diagnosis, but anaemia is generally present.

A course of treatment combining mepacrine and quinine was found satisfactory.

The results of treatment were uniformly good, but no extensive follow-up was possible.

My thanks are due to Sir Philip Manson-Bahr and to Dr. Arthur Davies for their constant help and advice.

Medical Memoranda

A Case of Extreme Exomphalos

Exomphalos is a well-recognized congenital malformation which is said to occur once in every 6,000 births. It is due to the non-closure of the abdominal wall, presenting a picture which, normal in early development, has persisted to term. The case described is one in which the defect was carried to the extreme.

CASE HISTORY

Mrs. A., aged 20, a primipara, was admitted to hospital in labour. Medical assistance was sought on account of a loop of intestine being delivered with the shoulders. This belonged to the foetus (not to the mother, as the midwife at first thought). Delivery was completed. The child, a female, was in good condition apart from a mass consisting of coils of intestine lying on the abdominal wall. This mass was gangrenous and distended. Removal was the only course open.

Operation was performed an hour after delivery. The object of the laparotomy was to remove the dead tissue and to see the exact nature of the lesion. No anaesthetic was given, and a right paramedian incision was made. The gut appeared alongside the umbilical cord, on the inferior aspect; the latter was normal. The exit was small, approximately an inch across, and the parietal peritoneum ended at the edges of the opening. At the upper end viable intestine was found at the end of the second part of the duodenum, and at the lower end the pelvic colon. At each end the gut was divided and a small tube ligatured in and brought out through the abdominal wound. Apart from a large liver no other abnormalities were seen. During the operation the child did not give any cause for anxiety.

It lived for six days, at the end of which death occurred from peritonitis. No other congenital defects were found at the necropsy.

The Specimen.—This consisted entirely of intestine. It began at the third part of the duodenum and ended at the beginning of the pelvic colon.

Small Intestine.—The upper part was discoloured small intestine surrounded by a mass of myxomatous tissue. The mesentery was twisted on its axis, forming a volvulus: from the appearance of the gut it was a recent development, but was not considered viable. Below this the ileum was lost in the large intestine and was found to be an intussusception of the ileo-caecal variety. This was reduced with difficulty.

Large Intestine.—This was very dilated and the taenia coli were not evident. The contents were fluid and contained much vernix caseosa. The mesentery was very thick, consisting of myxomatous tissue. At the lower end there was a constriction where it was obstructed at the exit from the abdomen.

The intestine thus presented a picture of obstruction of the large bowel with an intussusception and volvulus of the small bowel.

COMMENT

It is considered that the foetus *in utero* had a marked exomphalos containing the major part of the bowel. During the descent in the second stage of labour, lasting four hours, the peritoneal covering was torn off and the large bowel was compressed between the uterus and the foetal abdominal wall, obstructing the blood supply. Ensuing peristalsis resulted in the intussusception. The volvulus, as mentioned, was recent, and was formed towards the end of the second stage of labour.

There has been much discussion as to the absorption of glucose from the stomach. In this case part of the duodenum was present, but it was considered worth while to investigate the blood sugar after a known dose of glucose. 10 g. of glucose was given by mouth, and the blood sugar was estimated at half-hour intervals, the blood being taken from the anterior fontanelle. The result showed a curve which approximated to the normal adult curve, though the basic level was very low; the fasting level was 44 mg. per 100 c.cm. Considering that the child lived for six days on glucose given by mouth, good evidence is afforded that glucose is absorbed from the stomach and upper duodenum.

I wish to express my thanks to Dr. Daley, Medical Officer of Health, County Hall, for permission to publish this case; to Dr. E. Moore, obstetrician, Lambeth Hospital, for calling me to see the case; and to Dr. R. F. L. Hewlett, group pathologist, Lambeth Hospital, for the blood-sugar estimations.

Lambeth Hospital.

R. F. HENDTLASS, M.R.C.S.

Interstitial Emphysema during Labour

The following case is reported in view of its unusual character and rarity.

A primipara aged 17 was admitted to hospital in the early stages of labour and suffering from acute nasal catarrh with severe bronchial cough. Her previous medical history was good, with the exception of her grandfather, who had died of pulmonary tuberculosis, and her father, who had died at the age of 38 from meningitis. Labour started at 2 a.m. on Oct. 13; the membranes ruptured at 11.35 a.m. on the same day, and there was full dilatation of the cervix at 11.15 p.m. The second stage was characterized by really severe pains. The baby was born at 1 a.m. on Oct. 4.

At 12 midnight, one hour before the baby's birth, it was noted that the right side of the mother's face was rapidly swelling, and she complained of stiffness on that side of the neck. Within a quarter of an hour the face was completely unrecognizable: the eyes were quite closed and the cheeks had merged flush with the nose, and the lips were so swollen that the patient had difficulty in speaking. The swelling involved the head, including the crown of the scalp, the neck, and the upper part of the chest; in diminishing severity it also involved the whole area back and front of the chest down to the costal margins. The diagnosis of interstitial emphysema was made, all areas emitting the characteristic crackling crepitus and the skin giving the resonance to light finger-tapping similar to that of the surface of a sorbo ball. The pelvic measurements were not unduly small, and the baby at birth weighed 7 lb. 8 oz. The total length of labour was 23 hours 10 minutes. On clinical examination no chest lesion could be detected, neither could the patient recollect any special sensation in her chest before the onset of emphysema. An x-ray examination of the pulmonary fields was negative and the blood sedimentation rate normal. One week after labour the greater part of the swelling had subsided and the only crepitus that could be elicited was situated over the upper part of the chest on each side of the sternum. The puerperium was uninterrupted, and at no time did the patient appear to be affected by her condition.

ROGER STANLEY.

E. E. Katwinkel (*New Engl. J. Med.*, 1942, **226**, 419) records a case of typhoid fever in a woman, aged 59, in whom sulphathiazole and sulphanilamide in no way influenced the course of the disease and failed to clear the stools of *Bact. typhosum*. The stools, however, became and remained negative after eight days of intense sulphaguanidine treatment.