BREINL

Abstracts.

ON THE OCCURRENCE AND PATHOLOGY OF ENDEMIC GLANDULAR FEVER, A SPECIFIC FEVER, OCCURRING IN THE MOSSMAN DISTRICT OF NORTH QUEENSLAND.[1]

By A. Breinl, H. Priestley and J. W. Fielding.

O. Smithson[2] called attention in 1910 to a specific fever, occurring throughout the Mossman district, situated in North Queensland, which he termed "Mossman fever."

Definition.

Endemic glandular fever is an acute disease, characterized by an irregular remittent fever of from three days' to three weeks' duration, accompanied by painless swelling of certain groups of superficial lymph glands, and by the appearance of a macular, or occasionally vesicular, rash.

History.

The Mossman district was first opened up by Europeans in or about 1877, when timber-getters settled along the Daintree River, which is situated about twelve miles north of the present township of Mossman. Early settlers stated "that shortly after their arrival in the district cases of sickness occurred amongst them, of a continuous fever, lasting for several weeks, accompanied by swellings in the armpits and groin. They observed a similar disease amongst the aboriginal inhabitants" and stated "that this disease existed prior to their advent amongst the aboriginals of the district."

Distribution.

The disease prevails between the coastal range of mountains and the sea, in the Mossman district, within a limited area, extending approximately eighteen miles to the south and thirty miles to the north of the township of Mossman, a town situated at a latitude of 16° S., a few miles inland from Port Douglas. Sporadic cases of the same complaint came from Mount Molloy and Mount Carbine (west of the town of Mossman, over the coastal range), and from Maytown and Bloomfield, near Cooktown.

One man treated at the Townsville Hospital had left the Mossman district nine days prior to the development of definite symptoms.

Symptomatology.

Six days is the latent period between the reception of infection and the onset of symptoms, but for a few days in some cases even as long as eight days preceding the onset of pyrexia the patient suffers from a feeling of malaise, with diminished appetite. In one of the cases observed by us the temperature rose suddenly on the eighth day after his admission to the hospital. The patient was suffering from cane boils, but for two days previously he had complained of headache and loss of appetite. The case treated in the Townsville Hospital developed symptoms nine days after leaving Port Douglas, so that the length of the incubation period may, to a certain extent, vary and may be as long as ten days

The history does not bring out any distinctive features. The disease begins with a general feeling of malaise, with headaches, loss of appetite, accompanied by dry retching and vomiting. These symptoms become more and more marked as the disease progresses.

The temperature may rise suddenly or gradually, reaching its maximum within a few days, and is of a remittent type. Rigors are seldom observed. The high temperature persists for about ten days, but the time may vary from three days in a mild case to three weeks or more in a severe case. After the period of pyrexia the temperature falls by lysis.

The pulse-rate does not increase proportionately with the temperature. The pulse is soft, of low tension, and often dicrotic. The rate of the respiration is not altered. Headaches, which may be purely frontal or occipital, are always present, and pains in the back of the eyes are common, accompanied by a certain degree of photophobia. The patients complain of pains in the back and limbs, but not to the same extent as in dengue fever. Anorexia is always noticed, and sleeplessness and nervous irritability are marked features.

The Lymphatic System.—An enlargement of certain groups of the superficial lymph glands, in the majority of the cases of the axillary and inguinal, less often of the cervical glands, is invariably present. A slight enlargement is often observed at the time of the onset of the fever, which becomes more marked as the disease progresses, so that during the height of the fever the lymph glands may be as large as a walnut, but do not, as a rule, exceed the size of a marble. They are hard, indolent and often tender on deep pressure, and do not show a tendency to abscess formation. As the fever abates the swollen lymph glands decrease in size rapidly, though a slight enlargement may persist at times for months.

The spleen is not palpable, and the liver is normal in size.

Skin.—All the cases observed by us—only 30 per cent. of Clarke's cases—developed a well-marked rash on the trunk, arms and legs, and occasionally on the face, simultaneously with, or a few days after, the rise of the temperature, persisting for two to four days, and disappearing without any apparent desquamation. It may take the form of copper coloured macules, the slightly raised darker centre being surrounded by an erythematous halo, or may rarely be of vesicular character, closely resembling that of chicken-pox.

The majority of the patients sweat profusely, mostly at night. The tongue is coated with a thick yellowish fur, which at a later stage becomes dark brown. Pains in the throat on swallowing are quite common, due to an hyperæmia of the pharynx. Vomiting of bile-stained fluid often occurs. Most of the patients complain of constipation, but diarrhœa has been observed. The abdomen is not distended, nor is it tender on palpation. The urine does not

[1] Abstracted from the *Medical Journal of Australia*, October 24, 1914.

[2] "Mossman Fever," *Journal of Tropical Medicine*, 1910, xiii, No. 23, p. 351.

show any changes beyond those due to the pyrexia, being concentrated and of dark colour.

The respiratory tract shows no changes other than an occasional slight bronchitis, and the heart is, except in very severe cases, but little affected.

Relapses have been observed. The cases are classified under three headings, namely, the restless, the drowsy, and the chronic type.

The restless type, comprising about 92 per cent., is characterized by a marked nervous irritability, and restlessness, and occasionally twitching of the muscles, by troublesome nightmares and not infrequently by nocturnal delirium.

In the drowsy type, "the symptoms in general resemble those of the restless type, with the following exceptions: After an initial headache, often of distressing severity for a few hours, practically all symptoms of pain cease. The patient becomes drowsy and depressed, and he loses all interest in his surroundings. He is easily aroused to take food or medicine; the perspiration is not so profuse as in the restless type. Although the patient in the early stages takes his food well, he loses weight rapidly. The tongue is very dry, and rapidly becomes coated of a deep brown almost black colour. There are frequent marked twitchings of the voluntary muscles. The superficial lymphatic glands are more enlarged than in the restless type of the disease. Nystagmus may develop late in the complaint. During the second week after the onset of the pyrexia the drowsiness may deepen into coma, and a fatal issue rapidly ensue. A sudden fall to sub-normal, followed by a rapid rise of the temperature to 103° F. or even higher, may take place towards the termination of the disease.

In general, the appearance of the patient resembles one with typhoid fever, but there is no distension or tenderness of the abdomen. The characteristic typhoid rash does not develop, the spleen is not enlarged, tympanites, perforation, and hæmorrhage do not occur. In fifty-three cases of the drowsy type, eight of the patients had previously suffered from typhoid fever.

The chronic type, on the whole, resembles a mild restless type. In these cases the temperature may rise from a little above normal or even sub-normal in the morning to 99° F. or 101° F. in the evening. The lymph glands are only slightly enlarged, a feeling of malaise is well marked. These symptoms may persist for three or more months.

One attack of the disease confers a slight and transient immunity only, and the same person may contract the infection at yearly intervals.

Prognosis.

The prognosis is, generally speaking, very favourable; amongst 1,482 cases there was a mortality of less than 1 per cent.

Diagnosis.

When a case of endemic glandular fever occurs within the endemic area the diagnosis does not present any difficulties to the experienced; but since this fever resembles in some of its clinical aspects certain other diseases, the differential diagnosis must be discussed.

Many of the cases of dengue occurring in Queensland show a more or less pronounced swelling of the superficial lymph glands, and the rash in dengue fever simulates, in many instances, that of endemic glandular fever. The course of the fever, however, differs. In typical cases of dengue, the pyrexia lasts for five days only, being followed after a remission of about two days by a short relapse, whereas in this fever a fairly high remittent temperature persists, usually for ten days or more. The pains in the back, the bones and the joints, so well known in dengue, are but little marked. The pulse, rapid in the former and increasing proportionately with the temperature, is only slightly raised in endemic glandular fever. Besides, in dengue, the incubation period is shorter, the onset more rapid, and the convalescence extends over a longer period.

Endemic glandular fever was at one time considered to be bubonic plague. The differential diagnosis should not present any difficulties, since the swollen lymph glands in the latter are not symmetrically distributed; they are painful and tender and are prone to suppurate, though the course of the fever is similar in both.

On the whole, the clinical picture of the majority of cases of endemic glandular fever is not of the same severity as that of bubonic plague, and the anxious facial expression, so typical in the latter, is entirely absent. An isolated case of the fever outside the endemic area might be mistaken for bubonic plague, especially since the first cases of an epidemic are comparatively mild, but a bacteriological examination will decide the diagnosis.

In climatic bubo, a disease which occurs in North Queensland, and might be confused with endemic glandular fever, only the lymph glands of the groin become swollen and painful, and frequently suppurate, and the severe constitutional disturbances are invariably absent.

Endemic glandular fever has been termed, for an unknown reason, filarial fever, though there is no clinical resemblance between the two.

Etiology.

The etiology of endemic glandular fever is unknown. A great number of smears of the peripheral blood and of lymph gland juice obtained by gland puncture from patients stained by Giemsa's stain and by Breinl's wet methods were examined with entirely negative results.

Blood cultures were made from a number of cases of ordinary culture media, including serum, but were entirely negative in every case. The cultures made from the urine of one case showed no growth beyond a few colonies of *Staphylococcus albus*.

Pathology.

The blood of a number of patients was carefully examined, and it was found that the number of red blood corpuscles and the amount of hæmoglobin do not undergo any changes during the course of the disease.

The number of white blood corpuscles increases during the first few days, but a pronounced leucocytosis was not observed in any of our cases. The differential count showed an increase in the percentage of lymphocytes only (see Table I).

TABLE I.

Date of disease	R.B.C.	W.B.C.	Differential count				
			Polymorphs, neutrophiles	Transitionals	Lymphocytes	Eosinophiles	Large monocular
Case W.			%	%	%	%	%
2nd	4,630,400	6,900	71·8	0·6	25·6	—	2·0
7th	—	12,300	55·2	0·4	43·0	—	1·4
Case M.							
About 7th day	4,876,800	9,200	77·2	1·0	19·0	—	2·8
12th	—	11,766	53·4	0·4	44·6	0·2	1·4

Histology of Lymph Glands.—Lymph glands from the groin and neck of one of the fever cases were extirpated. On cross section they appeared hyperæmic, of light pinkish colour, soft and œdematous. There were no necrotic areas noticeable.

The histological examination of sections stained by various methods showed the typical picture of an acute lymphadenitis. There was œdema and small-celled infiltration in the periglandular tissue. The blood-vessels of the lymph glands were distended, and free red blood corpuscles were scattered in between the glandular tissue. The lymphoid tissue was permeated by distended lymph spaces, containing a few blood corpuscles and endothelial cells, some of them in varying stages of degeneration, the chromatin showing fragmentation. Many of the endothelial cells contained cell *débris ;* no necrotic areas were seen.

ANIMAL EXPERIMENTS.

Two monkeys (one *Macacus rhesus* and one *Cercopithecus* (?)) and one guinea-pig, were injected with about 10 c.c. of the peripheral blood of two patients, who showed well-developed symptoms of endemic glandular fever. In these monkeys a definite rise in temperature was observed on the ninth and tenth day respectively, after inoculation.

Since the temperature of both monkeys rose after the same interval it is evident that the fever was due to an infection from the blood of the patient. The body temperature previous to inoculation was fairly constant, and fell, in one case five days, in the other four days after the onset of the pyrexia to the normal; two control monkeys kept under the same conditions did not show any rise in temperature. The conclusion is therefore justified that the inoculation of blood from cases of endemic glandular fever into monkeys had given rise to a pyrexia, due to the causal agent of endemic glandular fever.

The lymph glands of the infected monkeys became slightly enlarged at the time of the onset of the pyrexia.

The guinea-pigs did not react to the inoculation in any definite way.

EPIDEMIOLOGY.

Persons of both sexes and of all ages are susceptible to endemic glandular fever. A racial immunity does not exist; Australian aborigines, natives of the Pacific Islands, and Asiatics are known to have contracted the disease. It seems that the old inhabitants of endemic districts contract the fever as well as newcomers, perhaps in a milder degree. A comparison of the number of cases of this fever which underwent treatment at the Port Douglas Hospital during the last few years, with the average maximum and minimum temperatures, and the monthly rainfall, makes it apparent that the air temperature, as such, and the amount of rainfall do not influence its incidence, and that there is no marked seasonal variation noticeable.

It is interesting to note that the number of cases admitted per month before April, 1911, was much higher than in the succeeding years (see Table II). At the end of March, 1911, the district was visited by a cyclone, followed by a very heavy flood. The figures seem to indicate that there may be a causal connection between the occurrence of the flood and the diminution in the number of cases.

The hospital records prove further that the incidence of the fever is not evenly distributed over the district, but that the greatest number of cases had come from certain well-defined localities, as a rule situated near to dense scrub country, although sporadic cases occurred throughout the whole district.

TABLE II.—NUMBER OF CASES OF ENDEMIC GLANDULAR FEVER ADMITTED TO THE PORT DOUGLAS HOSPITAL.

Month	1908	1909	1910	1911	1912	1913	1914
January ..	—	5	11	15	4	4	2
February ..	—	8	20	15	8	6	6
March ..	—	9	15	20	9	6	5
April ..	—	9	12	5	1	4	4
May	—	7	18	3	5	8	8
June ..	18	5	13	2	6	10	4
July	21	15	25	4	4	12	6
August ..	25	31	21	4	9	6	—
September ..	24	98	10	—	2	12	
October ..	17	21	17	1	7	3	—
November ..	3	2	14	8	9	4	—
December ..	1	2	12	7	5	3	—
Total ..	109	152	188	84	69	78	35

It was pointed out to us that farm hands employed in the cane fields, and farmers who were compelled to do manual work in the field, were more prone to contract the disease than supervising farmers, and that the number of women and children admitted to the hospital suffering from the fever formed a small percentage only of the total number of cases. During the six years for which records were obtainable only forty-three women were admitted out of a total of 715 cases.

Since cases of endemic glandular fever have been observed in districts where no sugar-cane is cultivated,

it is clear that the incidence of the disease does not depend solely upon local conditions brought about by the cultivation of sugar cane. All cases observed in other localities were, however, men who had spent some time previously in the dense scrub.

Nothing definite is known about the ways and means by which the disease spreads. There is no doubt that it cannot be considered a contagious disease, since no case has ever originated amongst the staff of the Port Douglas Hospital, and no in-patient of this institution has contracted the disease whilst in the hospital, although no special precautions are taken to prevent the possible spread.

Water and food as sources of the infection can be eliminated by the consideration of the localized distribution. The local occurrence and spread of the fever, the incidence of the infection in proximity to scrub country, and, furthermore, the fact that it is mostly cane cutters and field workers sleeping in camps, situated in sheltered places near water, who contract the fever, whilst the greater number of supervising farmers, who spend only the day or part of the day in the field, escape infection, indicates that endemic glandular fever is, in analogy with dengue, malaria, &c., an insect-transmitted disease.

Conclusions.

(1) Endemic glandular fever is a specific disease occurring in the Mossman district of North Queensland, characterized by a high remittent temperature of about ten days duration, enlargement of certain groups of the superficial lymph glands, and the appearance of a rash.

(2) The etiology of the fever is unknown, no parasites were discovered in the peripheral blood and gland juice, and cultural examination of blood and urine gave negative results.

(3) Histological examination of enlarged lymph glands showed the typical picture of lymphadenitis.

(4) Two monkeys were successfully infected by means of blood inoculation from two patients.

(5) Epidemic glandular fever is in all probability an insect-transmitted disease.

AN UNUSUAL CASE OF SCREW-WORMS IN THE NOSE AND NASAL ACCESSORY SINUSES.[1]

By George U. Huber, M.D., and Frank L. Flack, M.D.

J. M., farmer, aged 66, was referred to us October 5, 1914, for hæmorrhage of the nose. This patient had had trouble with his nose for several years. One year ago last August his nose began to discharge and became very sore. At varying intervals large masses of necrotic material were discharged from his nose. Following this he was relieved. Up until two weeks ago his condition had remained about the same. At this time a fly went in one nostril and came out of the other. Following this trouble he became rapidly worse. October 2, he felt something moving in his nose and called a doctor, who saw him several times and gave him treatment. This was of but little benefit. Finally the doctor injected chloroform and removed seventy-two Texas screw-worms. The patient's condition remained serious, and he was brought to the hospital for treatment. At this time a Wassermann test was made, which was strongly positive.

Under general anæsthesia the following conditions were discovered: The walls of the right antrum of Highmore were completely necrosed and the antrum filled with worms. The middle turbinate on the right side was markedly necrosed. The right frontal sinus was open, and the right ethmoidal cells exposed. The walls of the antrum on the left side were partly necrosed. The turbinate on this side was partly necrosed and the ethmoidal cells exposed. The right eye was swollen, shut, and a worm was found in the lachrymal sac. These worms were the ordinary Texas screw-worms, measuring about 1 in. in length and about $\frac{1}{8}$ in. in diameter. Forty were removed at operation. On the right antrum a Cadwell-Luc operation was performed. On the left antrum a Denker operation was done. The Ballenger turbino-ethmoidectomy was performed on both sides. The right frontal sinus was curetted. The right canaliculus was split and the lachrymal duct probed. All sinuses were packed with iodoform gauze, after a thorough irrigation with a 10 per cent. solution of chloroform.

The after-treatment consisted in blowing iodoform into the nose and sinuses for one week and a vigorous course of antisyphilitic treatment. After a week the man was in a much improved condition and left the hospital.

This patient had a long-standing specific necrosis of the bones of the nose and accessory sinuses which undoubtedly attracted the fly carrying the larvæ and furnished favourable conditions for their growth and reproduction.

October 27, 1914, the patient was cured of the worms, and the nose looks perfectly healthy except for the damage done by the specific necrosis previously.

[1] Abstracted from the *Journal of the American Medical Association*, December 26, 1914.

OIDIOMYCOSIS IN PORTO RICO.[1]

By E. R. Hildreth, M.D., and A. C. Sutton.

While about 150 cases of oidiomycosis have been recorded, this is the first case noted in Porto Rico. The diagnosis was made from an examination of fresh specimens of pus in 10 per cent. sodium hydroxide solution, and of stained smears. The pus, which was rather whitish, contained numerous doubly-contoured, oval and spherical bodies, frequently budding, and in the sodium hydroxide solution highly refractive. They varied from 10 to 15 microns in diameter. Besides there were many smaller spherical bodies about 3 microns in diameter.

[1] Abstracted from the *Journal of the American Medical Association*, December 26, 1914.

THE JOURNAL OF
Tropical Medicine and Hygiene

With which is incorporated "CLIMATE"

AND

Embodying Selections from THE COLONIAL MEDICAL REPORTS.

A BI-MONTHLY JOURNAL DEVOTED TO MEDICAL, SURGICAL AND SANITARY WORK IN THE TROPICS

EDITED BY

JAMES CANTLIE, M.B., F.R.C.S.; W. J. R. SIMPSON, C.M.G., M.D., F.R.C.P.; ALDO CASTELLANI, M.D.FLOR.; C. M. WENYON, M.B., B.S., B.Sc.; T. P. BEDDOES, F.R.C.S; AND A. J. CHALMERS, M.D., F.R.C.S.

SIR RONALD ROSS, K.C.B., F.R.S., MAJOR I.M.S. (*Honorary Adviser to the Editorial Staff*)

VOLUME 18

JANUARY 1 TO DECEMBER 15

1915

SWETS & ZEITLINGER N.V.

AMSTERDAM - 1967