

Commentary on “Some observations on an epidemic of sand-fly fever, occurring in one of HM Ships”

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Original article

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The ship in which I am serving recently underwent a refit at an East Indian port; owing to the unhealthy locality of the dockyard, the officers and men were accommodated ashore during the period of repairs, which was of nearly two months' duration (August 9 to October 5), one watch being quartered in the local Sailors' Home - in order to assist with the work on the ship - whilst the other was sent to a rest camp at a hill station. The watches changed places at the end of a month.

There were several cases of what was apparently sand-fly fever among the men living in the Sailors' Home but not a single case occurred among those residing at the hill station. In both places the men slept under mosquito nets. As I was with the men in the hills when these cases occurred in the port, I had no opportunity of studying them, so these observations will be confined to those cases which actually developed and were treated on board.

The men returned to the ship on the morning of October 5, one watch coming straight from the rest camp, and the other from the Sailors' Home.

On October 7 the first case of what was undoubtedly sand-fly fever came under observation and from this date there was a small but steady daily influx of fresh cases until October 31, when the epidemic suddenly ceased. In all there were thirty-nine cases distributed among the officers and various ratings in the following proportion: Officers, 5; Marines, 5; seamen, 11; engine room ratings, 15; and daymen and telegraphists, 3.

The ship left her port of refit on October 17, and with the exception of three days has been at sea ever since in a drier and healthier climate. For the first five days of the epidemic

none of the men who had come direct from the rest camp were affected, but after that period, the disease was more indiscriminate in its choice of victims. One other noticeable feature in the distribution of infection was that the majority of the people attacked were those who slept between decks (most of the men sling their hammocks on the upper deck). This was peculiarly apparent in the case of the five officers who contracted the disease. They all had cabins on the lower deck in the after flat - an inefficiently ventilated compartment. Four of these officers had contiguous cabins situated on the side of the ship most exposed to the sun, not one officer who had a cabin on the main deck was affected. I verified the presence of sand-flies in the ship and presume they had invaded during her refit, as I had never seen any before that time. I noticed the absence of these insects at the hill station, which accounts for the non-appearance of the disease at that place. Nearly all the cases complain of having been bitten by "mosquitoes".

The symptoms

Each one of the thirty-nine cases was practically a replica of the others, almost the only variation being the degree of pyrexia. The onset was invariably sudden, indicated by pain in the back and limbs, frontal headache and pain behind the eyes. The conjunctivae were invariably suffused and there was slight intolerance to light; a temperature ranged from 101°F, to 103°F (38.3-39.4°C) and a markedly slow pulse in relation to the temperature - a symptom which obtained during the whole course of the disease. During the first three days the temperature had a tendency to drop to 100°F (37.8°C), or thereabouts, and in the minority of cases gradually sank to normal by the sixth or seventh day, but in the majority there was a distinct rise on the fourth or fifth day, the thermometer registered 102°F to 103°F (38.8-39.4°C); this was followed by a rather rapid drop to normal on the sixth or seventh day. This latter type of temperature does not correspond with the description of the phlebotomus fever given by Staff Surgeons JE Johnston and TW Miles in the July 1917 edition of the journal, p. 326, but

rather simulates the terminal rise one sees in dengue fever; the absence of rash and the slowness of pulse differentiate between the two complaints. The duration of the fever was six days in twenty-five cases and seven days in the other fourteen. Convalescence was invariably uninterrupted and rapid.

During the course of the disease the patient chiefly complained of the pain in the back and behind the eyes, also of insomnia and sweating. They were practically unanimous in the description of their symptoms; one complained of stiffness of the muscles of the neck; three had herpes labialis, but otherwise there was no difference except in degree. Constipation necessitated the use of aperients in most cases. There were no chest complications and the urine in every case devoid of albumen.

Until the middle of October I had no microscope, but after that time I regularly examined the blood films. An increase of mononuclear leucocytes (7 per cent.) was the most noticeable change from normal.

Treatment

One could only alleviate symptoms. Aspirin had a most beneficial effect on the headache and pains in the back and limbs. Unfortunately I soon exhausted my stock of this valuable drug and had to substitute sodium salicylate, which was not nearly so efficacious. Quinine is worse than useless, only increasing the headache. I relieved the insomnia by Dover's powder in 10 gr. doses or else by veronal (6 gr.), the latter drug giving the most excellent results, producing a dreamless sleep, without the subsequent constipation associated with compounds of opium. During the fever the diet consisted of milk, eggs and Bovril.

The accommodation of the sick was a little difficult, but fortunately the weather was fine. The men were slung in their hammocks in a screened-off portion of the fore-castle deck. The captain kindly placed his cabin at the disposal of the sick officers. It made quite a comfortable little hospital. During convalescence Eaton's syrup was administered. As the sick berth attendant was suffering from malaria at the time of the epidemic a great deal of extra work was thrown upon the sick berth steward, whose conduct deserves every praise.

Beyond thorough airing of bedding, and keeping the ship as dry as possible, together with as much ventilation as practical, little could be done in the way of prophylaxis.

Diagnosis

Dengue, malaria and small-pox seem to my mind the most likely diseases one is likely to confound with sand-fly fever, but as previously stated the absence of rash together with the slow pulse, distinguish it from the first named

complaint. With regard to malaria, the absence of rigors, the character of the pyrexia and, if one has a microscope, the blood should enable one to differentiate. The backache and pyrexia certainly suggest variola, but the absence of any prodromal rash, associated with recent vaccination, should dispel one's anxiety on this score.

Commentary

Buckeridge describes an outbreak of sandfly fever that began ashore and continued on-board a Royal Navy ship in East India during the First World War (1). Sandfly fever is caused by an arthropod-borne virus (arbovirus), which is transmitted by the bite of Phlebotamine sandflies and typically causes an acute fever-arthralgia-rash type of illness (Figure 1).

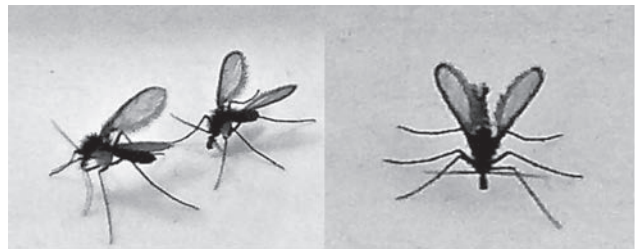


Figure 1. Phlebotamine sandflies. Body length ~5mm. Characteristic features include the hairy body and wings and the 'V' position of the wings at rest (taken from the author's collection).

The clinical findings reported by Buckeridge were fairly non-specific and so it is difficult to distinguish the cases from other arbovirus infections (such as dengue or chikungunya) or other causes of acute undifferentiated febrile illness in the tropics (2). However, malaria was excluded on blood films and none of the 39 cases had any characteristic features of visceral leishmaniasis, enteric fever, brucellosis, Q fever, leptospirosis, relapsing fever or rickettsial infections. Conjunctival suffusion can be a feature of leptospirosis, but the lack of albuminuria helps exclude this diagnosis and the same clinical sign has also been reported in chikungunya, which seems unlikely due to the lack of severe or persistent arthralgia. The absence of any rash does make dengue less likely, but the characteristics of the fever chart and "relative bradycardia" described are no longer considered specific to this disease. Overall the arthropod bites, non-specific clinical features and rapid onset and resolution of symptoms do make an arboviral infection most likely.

The finding of sandflies inside the ship certainly supports the diagnosis of sandfly fever and there is evidence of on-board transmission since personnel from the hill station were only affected after coming on-board and cases occurred for fourteen days after leaving port (with a known incubation period for sandfly fever of three to six days).

The focal distribution of cases below decks despite the use of (non-impregnated) mosquito nets fits with what we know about sandfly behaviour and the short life span and lack of a suitable breeding environment for sandflies would help explain why the outbreak suddenly ceased after a fortnight at sea.

Sandfly fever remains a threat to military personnel today with confirmed cases and outbreaks occurring in Cyprus (3-5). At present it can only be diagnosed on serology

(antibody-detection) tests at the UK reference laboratory and these will often be negative during the acute phase of the disease. This diagnostic uncertainty may lead to significant problems for deployed troops and clinicians even though the disease is self-limiting with no major sequelae. No anti-viral treatment is available and prevention measures are limited to bite avoidance and control of the sandfly vector.

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