AN OCCURRENCE OF TOXIC CONVULSIONS DUE TO POISONING WITH ILLICIUM RELIGIOSUM

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DURING the first two weeks of November, 1955, eleven cases of convulsions were reported amongst the troops of 22nd Special Air Service Regiment operating in the jungles of Malaya. Cases occurred in different squadrons situated in widely separated areas of jungle. Four men who suffered from these convulsions were subsequently questioned and an account of their condition during the attack obtained from eye-witnesses.

The histories were briefly as follows:

Case 1. Trooper H., engaged on a training operation. An hour after eating his evening curry meal, this man fainted and remembered nothing else until regaining consciousness. An eye-witness described his condition during the short period of unconsciousness as "frothing at the mouth, face turgid and momentary cessation of respiration." He first held his body rigid with the knees flexed on the abdomen, then proceeded to roll from side to side with accompanying limb movements (presumably tonic followed by clonic convulsions). On regaining consciousness he vomited his last meal. There was no history of incontinence or tongue biting.

Case 2. Trooper W., of "A" Squadron. An hour after consuming his evening meal, this man fainted and remembered nothing else until regaining consciousness; following this he felt dazed for a few minutes and then vomited his last meal. The next day he felt quite well. An eye-witness described him as unconscious for five minutes. The pupils were noted to be dilated. His muscles were first observed to be taut; following this he exhibited convulsive movements of his limbs. There was no history of tongue biting or incontinence.

Case 3. Trooper S., of Para Squadron. This man had two episodes over a period of eight days. On each occasion, an hour after the evening curry meal, he vomited, lost consciousness, and on coming to, noted that he had bitten his tongue; again there was no history of incontinence. This man was subsequently evacuated by helicopter as a case of suspected epilepsy, but on returning to base exhibited no further fits. An eye-witness relates that during this man's periods of unconsciousness his teeth were clenched, he moaned and thrashed his limbs around. It was also noticed that his pupils were dilated.

Case 4. Lieutenant H., of "A" Squadron. Two hours after his curry meal this man was lying on his hammock when he noticed twitching of his limbs. He fell asleep
but awoke to find the twitching was more marked. He again fell asleep, but this time had a nightmare in which he thinks he had convulsions and cried out. He was roused by his orderly who found him on the ground where he had fallen from his hammock; in falling he had dislocated his right shoulder. Later he vomited, but this was probably due to the morphia administered to relieve the pain of his dislocation. The following morning he was evacuated from the jungle for reduction of his dislocation. There was no history of incontinence or tongue biting.

These histories, together with the reports of the other seven cases of fits, resemble one another in that each occurred in the evening following a curry meal, consciousness was lost, convulsions were noted, vomiting usually occurred, and the individual was apparently quite well the following day. None of the four men questioned admitted to a personal or family history of epilepsy. It is not unreasonable therefore that the men themselves and their officers ascribed the cause of these episodes to something which had been eaten in the evening meal.

Troops in operations in the jungle usually consume one large meal in the day; this is prepared in the late afternoon or evening before the dusk stand-to. Each man prepared his own food from a 24-hour ration pack.

At the time, 22 S.A.S. Regiment had been using a new, locally packed, 24-hour ration for British troops. The evening meal from this ration would consist of rice, tinned meat, optionally flavoured with curry powder from a packet, tinned peas, and a sweet consisting of dates, confectionery, or both. Soup, tea, and biscuits may also be consumed.

None of the men questioned admitted to adding locally purchased condiments or any locally found jungle foods to his meal. Only the contents of the rations were used. Further, the meal was heated by hexamine solid fuel cookers. Old petrol tins were not used for cooking, so that the possibility of poisoning by tetra-ethyl lead or some extraneous item could be excluded.

Suspicion as to the cause of these toxic convulsions fell on to the curry powder for two reasons. First, the other items of the ration—rice, tinned foods and confectionery, etc.—were all reputable brands and had been used by troops for some time. The curry powder, however, was a new addition to the ration and was prepared by a local contractor. Secondly, a few weeks prior to this outbreak of convulsions, the Royal Army Service Corps had removed the condiment Bunga Lawang (star anise) from the ration scales for Imperial Malay Troops. Star anise is used to flavour curries; it is the fruit of *Illicium verum* and supplies are normally obtained from China. The Chinese variety of star anise is non-toxic. However, supplies of star anise from Communist China have been increasingly difficult to obtain in the Federation and Singapore, and merchants were obtaining supplies of a Japanese variety of star anise, the fruit of *Illicium religiosum*. Although the two fruits are almost identical in appearance, *Illicium religiosum* is a bastard variety of *Illicium* found growing around Buddhist temples in Japan; it contains a highly poisonous fraction, the convulsant activity of which has been known for some time. Langaard, quoted by Blythe (1906)
described an instance of poisoning with *Illicium religiosum* of five Japanese children in 1880. Sze Yee Chem (1929) also gives an account of the toxicology of this fruit, and Simpson (1935) ascribed the death of a male Tamil to drinking milk containing powdered Japanese star anise. Medicinal properties have been attributed to star anise by the Chinese and it is also reputed to be an aphrodisiac.

Following an instance of poisoning of nine Malay Police Constables in Singapore where the cause was attributed to Japanese star anise (Wong Poi Kwong & Wan, 1955), and because the Japanese variety of star anise could be easily mistaken for the true non-poisonous Chinese variety, the R.A.S.C. withdrew star anise from the Malay ration scales.

The curry powder in the 24-hour, locally packed, ration for British troops, however, was mixed locally and was thought likely to contain star anise. In view of this suspicion, fifteen packets of this curry powder (each stated to contain 5 g.) were forwarded to the Army Food Laboratory for investigation.

The contents of these fifteen packets were defatted with petroleum ether and then extracted with alcohol. The alcoholic extract was evaporated and the resulting solution was extracted by the method used by American workers for the separation of anisatin from the fruits of *Illicium religiosum* (Lane et al., 1952). The resulting extract was finally extracted with water and diluted to 15 ml. (1 ml. being equivalent to one packet of curry powder).

The solution was tested by Dr. R. G. Y. Lin, of the Department of Physiology, University of Malaya, by intraperitoneal injection into rats: 1 ml. of the extract produced typical convulsions in the rat in fifteen minutes, similar to the convulsions produced by an extract prepared from the fruit of Japanese star anise.

From these results it was assumed that the curry powder contained toxic Japanese star anise fruits from *Illicium religiosum*. This particular curry powder has been withdrawn from the ration scales and has been replaced by an Indian curry powder, guaranteed not to contain star anise. No further cases of convulsions have been reported.

It is of interest to note that only eleven cases of this nature occurred out of a whole regiment, nearly all using the same rations; furthermore, this curry powder was also on issue to other operational units in Malaya. This discrepancy can be explained by several reasons. Firstly, 22 S.A.S. Regiment is peculiar in that it remains in the jungle on operations for periods of up to three months at a time; other units only remain in the jungle, fed by 24-hour rations, for far shorter periods. Moreover, the men of 22 S.A.S. Regiment have found it more satisfactory, when living in the jungle, to live as the local inhabitants and limit their diet to one very large rice curry meal per day, interspaced perhaps with two small snacks of tea or soup and biscuits. The cumulative effect of consuming daily subtoxic doses of *Illicium religiosum* over a long period cannot be overlooked. Secondly, not all soldiers have a liking for curry and some eat their meat unflavoured with curry powder. All those who suffered from convulsions, however, had taken curry powder. Lastly, the amount of star anise added to curry powder is small, and inadequate mixing may have led to only certain portions of the powder containing the toxic compound.
Impetigo

SUMMARY

An outbreak of food poisoning amongst the troops of 22nd Special Air Service Regiment is described. The histories of the men affected were similar in that each became unconscious and exhibited convulsive movements of the limbs. The cause of this intoxication was ascribed by laboratory tests to poisoning with the fruit of *Illicium religiosum*—Japanese star anise—which was incorporated in the curry powder on issue to these troops.

REFERENCES


IMPETIGO

A SUGGESTED RÉGIME TO DECREASE ITS ASSESSED MORBIDITY

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During the last twelve months the clinical impression has steadily grown that the period of unfitness for normal duties, in cases of impetigo, is unreasonably long. In view of this it was felt that a factual assessment of the problem was worth undertaking.

Seventy-seven consecutive cases of impetigo have been qualitatively assessed from the point of view of actual length of morbidity. The cases have all been taken from the period 1954-5 and have been in no way selected, except in as much as certain cases have had to be excluded due to inadequacy of the case note details, as regards certain time intervals. The cases have been analysed basically from three points of view:

1. Duration of incapacity prior to hospitalization;
2. Duration of hospitalization;
3. Duration of hospitalization in relation to the therapy employed.