AN EPIDEMIC OF VOMITING AND VERTIGO AT THE ARMY SCHOOL OF PHYSICAL TRAINING

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From the middle of November 1955, to the end of term on December 16th, there was an epidemic of mild illness amongst the staff and personnel on courses at the Army School of Physical Training. The epidemic was not recognised as such until about November 21st. Until then the few cases of vertigo and vomiting were variously diagnosed as gastritis, 'flu, or coryza.

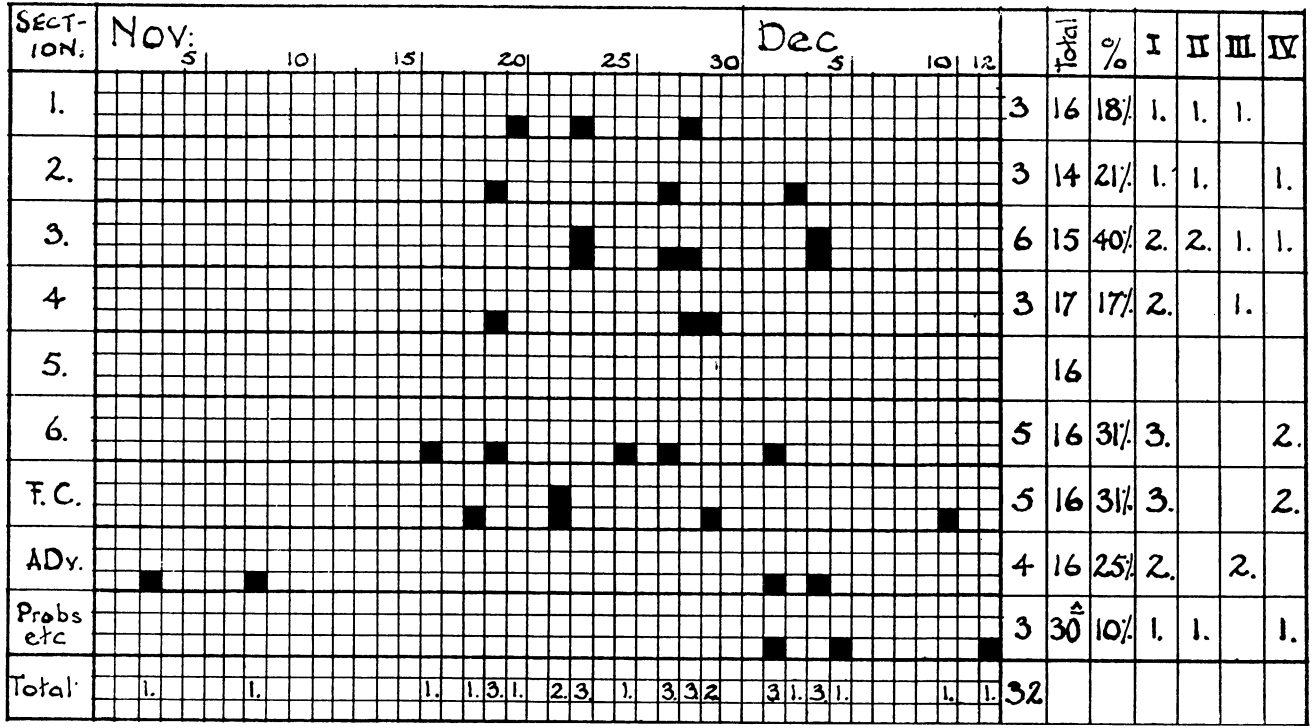
Thirty-three cases were seen. Typically, the illness started with a short period of malaise with coryza: vomiting or vertigo would then ensue. During the illness there was severe weakness and headache, but usually within three or four days the patients were fit to return to duty. There was no fever. The characteristic physical signs were those of impaired balance with nystagmus in nearly every case. There was no muscle tenderness.

The information on which this report is based is entirely clinical, and has been taken from routine case notes supplemented in twelve instances by a questionnaire. Some details have been completed in retrospect.

Epidemiology

The population at risk in the school at the time of the epidemic was 225. The total number of cases was 32, giving an overall incidence of 14.2%. Of those affected 62% were on the short six weeks course, and they comprised 44% of the total population including their sergeant instructors, none of whom contracted the illness. Within this group the incidence was 24.5%. The short course is divided into six sections, each living separately in the barracks (four barrack rooms in two-storied blocks). They do their work largely as separate units in the school. Feeding arrangements and changing room accommodation are communal. The incidence of the disease in the sections varies from 0 to 40%. Four of the 16 members on the three months P.T. course were affected, and five (25%) on the fencing course. This last group was more isolated than the others, and nearly all their work was done in a very warm gymnasium. Several of them lived at home. The average age for this course was much higher than the other.

Development of the epidemic. This happened very gradually. It may be seen from chart I that there was a spread of 28 cases in


SECTION:
NOV:
5
10
15
20
25
30
DEC
5
10
12
Total
%
I
II
III
IV
1. 3 16 18% 1. 1. 1.
2. 3 14 21% 1. 1. 1.
3. 6 15 40% 2. 2. 1. 1.
4 3 17 17% 2. 1.
5. 16
6. 5 16 31% 3. 2.
F. C. 5 16 31% 3. 2.
ADv. 4 16 25% 2. 2.
Probs etc 3 30 10% 1. 1. 1.
Total 1. 1. 1. 1. 3. 1. 2. 3. 1. 3. 3. 2 3 1. 3 1. 1. 1. 32

20 days. Never more than three persons became ill with the disease in one day.

Whatever the cause of this illness, it does not appear to have been of a very high degree of infectivity, for, if it had been, one would not have expected section 5 to be free from infection. There were never more than two people sick in a barrack room at the same time; if it had been highly infectious, one would have expected to find cases occurring all over the barrack rooms. As it was, the patients tended to be grouped together, and yet in the one group working in a single enclosed space (the fencing course) there were only five cases.

Incubation Period. If the illness was transmitted within the section (which is suggested by the periodic presentation of patients in sections 2, 3, and 6) then the incubation period must be somewhere between two and four days. It is most unlikely that the illness was communicable from the first day because, in that case, the incubation period in section 4 would have been nine days. On the other hand, if the patient is infective while he has severe symptoms, that is, whilst he is in bed—an incubation period of two to four days is probable in every case. The disease in adults did not become more severe as the epidemic progressed. Children seemed more mildly affected than adults. Further, it is unlikely that the incubation period is longer than four days, and that the illness spreads from a common source, because the cases did not present with an explosive frequency.

Chart I illustrates the spread within the section. The various manifestations seem to appear periodically within four days in a section.

Symptomatology

The patients form four distinct groups whose symptomatology differs, but hardly enough to consider each symptom group as being caused by a separate disease-provoking agent (see chart 2). Although this is only a small series, the illness mild, and the differences so largely dependant on history, division into these groups was informative and helpful:—

Group 1—predominant vertigo (16 cases).
Group 2—unsteadiness (5 cases).
Group 3—predominant vomiting (5 cases).
Group 4—vomiting and vertigo (7 cases).

The onset was sudden, the symptoms appearing and reaching a climax in less than twelve hours in just under half the patients.

In group 4 this occurred in six out of the seven patients, whereas in group 1 the onset was rapid in only 37%.

Twenty-three patients complained of vertigo, and in eleven instances it was the presenting symptom. It was clearly differentiated from unsteadiness and a rotational element was present. In half the cases the symptom was apparent on getting out of bed in the morning, and in a further seven on exercise, especially on bending down. In three instances there was only one attack, but the worse affected experienced vertigo whenever the head was raised from the bed in the acute phases of the illness. In most instances the attacks only lasted a matter of seconds over a period of two to three days. Many patients also complained of unsteadiness. It was apparent that some were describing this sensation of " being giddy," when they really meant unsteadiness. There were proportionately more with this symptom in groups 1 and 2. Most of the patients said that they could not see straight, or that their eyes were all blurred, or that they could not focus properly. On analysis this was revealed as an inability to fix the eyes on a point. The eye reflexes were normal in a number of patients who were tested. Only one patient complained of diplopia, and this was transient.

Vomiting occurred in twelve patients, and in ten it was the presenting symptom. In seven cases it recurred from two to five times. In ten it happened from 10 p.m. to 7 a.m. About a quarter of the cases suffered from a mild diarrhoea. There were proportionately fewer in group 1. Anorexia was present in most cases, and in some was complete for a day or two.

Severe throbbing headache was present in 19 cases; in three it was the presenting symptom; in four it was described as the worst part of the illness. In nine it was situated behind the eyes, and in four it was frontal. There were proportionately more complaints of headache amongst group 1 than among the other groups. Backache occurred in ten patients and commenced on the second or third day of the illness as a constant severe ache in the lumbar region; one patient complained that it was his worst symptom.

Nineteen patients had coryzal symptoms, and fourteen started the illness with coryza. Six, out of the ten who had a stuffy nose, were in group 1, whereas in group 3 there were none. Ten patients complained of being shivery but were all apyrexial. It is significant that none of these patients complained of deafness.

Clinical examination. In the clinical examination the most striking features were that the patients were often unsteady and subdued looking, and some of them had slight photophobia. The

severity of the illness could not be judged by the patient's appearance. Physical findings were conspicuously absent. Those with sore throat had slight hyperaemia, and one patient had a purulent exudate on the tonsils. There were no abnormal physical findings in the chest, and the cardiovascular system was normal. There was a mild pyrexia in five cases.

In the central nervous system the reflexes were invariably normal. Slight unsteadiness was characteristic: the problem was how to assess this. Romberg's test was always negative, but the following modification was found to be diagnostic: the patient was told to stand on one leg with the eyes shut, if he overbalanced the test was said to be positive. Where the patient's balance was obviously impaired, he was asked to perform the finger to nose test. In some of these cases there was past-pointing and some tremor. Nystagmus was common in almost every case. It was fairly coarse and rapid, but improved noticeably as the disease waned, disappearing completely in a day or so in all but the worst cases. The direction in two cases was with a slow component to the right on looking to the left, the hallucinated movement going clockwise. In one instance when the hallucinated movement was anti-clockwise the slow component was to the left, nystagmus was fairly rapid and of medium amplitude, the slow component of the nystagmus moving in the direction of the hallucinated movement. This is in contrast to the findings of Raffle (1954).

If these cases had occurred individually, the diagnosis would have been very difficult to establish.

The duration of the illness was from two to four days in seventeen instances, and, in a further nine, from five to seven days. The longest duration was nineteen days, and one other case lasted for fourteen days. Excluding these two the average length of illness was:—

Group 1	.. ..	4.1 days
Group 2	.. ..	3.8 days
Group 3	.. ..	2.0 days
Group 4	.. ..	4.8 days

Treatment

As there was no sick-bay the patients were nursed in their barrack rooms. Twenty-eight of the thirty-three cases were sent to bed. Fifteen were in bed for two days, seven for three, and one for eight. Only three of the patients in group 3 were sent to bed, and then only for two days or less. On the other hand, all but two of group 1 were sent to bed for an average of just over two days. Antihistamine drugs were tried, but did not appear to alter the course of the disease.

CHART II.

Group	Sudden Onset	Vertigo	Weak	Unsteady	Nausea	Vomiting	Diarrhoea	Headache	Coryza	Duration in days	Days in Bed	% in each group of the total
I (16)	37%	100%	87%	44%	31%	0	18%	68%	75%	4.1	2.24	48%
II (5)	40%	0	40%	100%	20%	0	40%	60%	40%	3.8	1.8	15%
III (5)	80%	0	60%	60%	20%	100%	20%	40%	0	2.0	0.8	15%
IV (7)	85%	100%	71%	35%	71%	100%	28%	43%	71%	4.8	2.56	21%
Percentage with each symptom	57.5%	69%	73%	45%	36%	36%	27%	58%	57%			

Representative Case Histories

The following case histories illustrate the type of illness encountered in each group.

Group 1. Case 1. A warrant officer on the fencing course reported sick with a history that he had felt unwell for two days. On the previous day he had had severe attacks of vertigo in a clockwise direction lasting for a few seconds and recurring every hour or so. He was unable to fix his eyes properly on objects. The vertigo began when he got up, but did not cause him to fall down or vomit. He felt so sluggish that he was unable to continue with his work. The remaining bodily functions were normal. The past history was excellent.

On examination he appeared a little worried, unwell and unsteady. The eyes were rather bright, and there was slight photophobia. There was fairly rapid regular nystagmus with the slow component to the left on looking to the right. His balance was impaired. The reflexes were normal. There was no muscle tenderness or neck rigidity. The fauces were clear.

Progress. He was sent to bed and for the next two days felt extremely weak; as he put it, "completely helpless; I do not think I could have forced myself out of bed." He spent most of the time sleeping, and, each time he raised his head off the pillow, he felt giddy. He had no appetite. Throughout the illness he had a slight frontal headache. Four days later he was still unsteady, although his strength was returning. There was no coryza. Nystagmus and impaired balance persisted. He returned to full duties two days later, but it was not until ten days after the illness had begun that he felt really fit. The last symptom to disappear was inability to fix his eyes on objects. Throughout the illness he remained apyrexial.

This patient was nursed at home, and, during the last four or five days of his illness, his wife developed a severe cold.

Case 2. A bombardier woke up feeling shivery, with a stiff neck and a severe bitemporal headache. When he got up and bent down he became giddy, and objects moved about him in a clockwise direction for about ten seconds. He did not vomit. When seen, he did not look ill and was apyrexial. His balance was impaired. For two days he was nursed in bed, and during this time he experienced vertigo roughly each hour. He was weak and was off his food, he had stiffness in the lower back during the first day, but was able to return to full duties on the fourth day.

Group 2. Case 3. A lance-corporal felt a cold coming on, and, during the night, had severe attacks of colic with diarrhoea. When he got up he had a bitemporal headache, and felt unsteady and off colour. There were no other aches or pains; there was no vomiting, and he was apyrexial. **On Examination** the characteristic signs of lack of balance were present, and there was no other abnormal physical finding. After a day's rest in bed, the diarrhoea ceased and he felt better, but he remained unable to balance on one leg with his eyes shut. On the following day, he was able to return to full duties.

Group 3. Case 4. A soldier had a sudden, unheralded attack of vomiting followed by an orbital headache in the evening. This was followed by a further vomit during the night. He had no definite vertigo, but felt unsteady. There was no history of recent illness in the family, and his own health was good. He had no temperature.

On examination, the only abnormal finding was impaired balance. After a day in bed, he was much steadier, and he started reduced duties on the following day.

Group 4. Case 5. A corporal, on 48 hours leave, woke with a violent headache and vomited as he got out of bed. Soon after, he had an attack

of vertigo which lasted for about a minute, everything moving round in a clockwise direction. This was followed by diarrhoea and coryza. Next morning he was giddy whenever he lifted his head off the pillow; he felt weak and had a transient pain in the small of the back. He was able to get up that evening, and next day reported sick, feeling weak and unsteady, with a cough and sore throat. There was no history of recent illness, but his two children had suffered during the previous week from sickness and dizziness.

On examination there was slight tenderness in the epigastrium. There was nystagmus greater on looking to the right. The reflexes were normal. The fauces were slightly inflamed. He was treated with bed rest. On the following day, he complained of insomnia, was shivery but apyrexial. The nystagmus was less and the diarrhoea had stopped. He returned to duty next day.

Discussion

This epidemic resembles those described in this country by Miller and Raven (1936), and Bradley (1943); and, in Denmark, by Rischel (1935), and Henningsen (1936), but it seems that the vertigo in these cases was a more prominent symptom than the vomiting and nausea and resembles more closely those cases reported by Watts (1954), Yuille (1954), and Raffle (1954), and those reported by the epidemic observation unit of the College of General Practitioners (*Research Newsletter* No. 4).

It is difficult to incriminate the alimentary canal as the primary site of affection, and is more likely that we are dealing with an infection of the central nervous system: the symptoms of vertigo and unsteadiness, the severe headache and photophobia support and the presence of nystagmus and inco-ordination would seem to strengthen, this view.

In many instances a coryza-like infection precedes the illness, which may indicate that it starts as an upper respiratory tract infection, thence gaining entry to the central nervous system. On analogy one may suspect it to be due to a virus. If this is so, where does it attack? The most likely explanation for the vertigo is given by Raffle (1954); that it is a neuronitis or affection of the vestibular nuclei, or of the medial longitudinal bundle. The vomiting could possibly be caused by involvement of the closely related dorsal nucleus of the vagus. Could the shivery sensations and apyrexia, the anorexia and the occasional insomnia be explained by involvement of the hypothalamus?

In this particular epidemic, we were dealing with men taking part in instruction in physical training, and the implications of an illness causing attacks of giddiness might have been quite serious. In fact, only one participant sustained an injury, and that a sprained elbow whilst performing on the parallel bars. One private reported with vertigo after a boxing bout, but from his history it was evident that he was suffering from epidemic vertigo. The disease can be quite alarming to the patient and reassurance is necessary.

References at foot of p. 50

EPIDEMIC OBSERVATION UNIT

Bornholm Disease

The following positive and negative reports have so far been received:—

Positive

Co. Dublin	10	30th March, 1956—21st October, 1956
Co. Dublin	15—20	5th September, 1956—2nd November, 1956
Swansea*	75+	Throughout the summer
Swansea	20	Early June—late July
Swansea	20	14th June, 1956—1st August, 1956
Swansea	50	Mid June—end July, 1956
Carmarthen	50	May—September, 1956
Haverfordwest	6	November, 1955
Coventry	3	4th May, 1956—4th October, 1956
Wallasey	3	10th—20th August, 1956
Gloucester	2	14th August, 1956—16th August, 1956
Stoke-on-Trent	9	6th August, 1956—7th October, 1956
Harrogate	1	15th October, 1956
Sheffield 10	3—4	August—October
Leeds 17	5	January—November, 1956
Leeds 7	3	8th November, 1956—26th November, 1956
Bushey	less than 5	September
London N.	1	30th October, 1956
London, E.13	1	1st November, 1956
Slough	1	27th November, 1956

*About 2,000 cases are thought to have occurred in the Swansea area this Summer.

Negative

Belfast (2)	Hereford	London, S.W.4
Carrickfergus, Co. Antrim	Worcester (2)	London, E.8
Edinburgh	Rugby	London, S.E.3
Glasgow	Birmingham	London, S.W.1
Cupar, Fife	Alford	London, N.W.2
Sutherland	Stamford	Dagenham
Falkirk	Leicester	Chelmsford
Lauder, Berwickshire	Stoneygate, Leics.	Ilford
S. Shields	Ibstock, Leics.	Crowborough
Leeds 17	Norwich (2)	St. Mary Cray
Doncaster	Lowestoft	Dover
Hull	Bedford	Chessington
Slaithwaite, near Huddersfield	High Wycombe	Henfield
Cropwell Bishop	Hoddisham	Hindhead
Widnes	Paignton	Ashtead
Stockport	Honiton	Sutton
Liverpool	Dartmouth	Havant
Cirencester	Ilfracombe	Eastbourne
Glastonbury	Northwood, Middx.	Hastings
	Hampton, Middx.	Christchurch, Hants.
	Greenford, Middx.	

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