AN EPIDEMIC OF BORNHOLM DISEASE PRELIMINARY REPORT

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An outbreak of an infectious disease, the symptoms of which suggest Bornholm disease, is occurring in Oxford. The cases are appearing not in a closed community, where recognition is usually much simpler, but among the general population of the city; and if it had not been for one or two fortunate clues this outbreak might well not have come to light. Inquiry has since shown that there have been recent outbreaks in other areas, but this fact was not generally known in medical circles in Oxford when the epidemic began. We were lucky enough to find some of the early cases and so to draw the attention of the local medical profession to the presence of an unfamiliar disease. There is no doubt that this early communication has been of the greatest assistance to practitioners, and has enabled a correct diagnosis to be made in many cases of what is often a puzzling and, at times, a worrying disease. It is as a result of this experience, and because we feel that the disease may possibly be prevalent in other areas, that we have decided to publish this preliminary report. Present-day knowledge of Bornholm disease is very incomplete, and any opportunity of obtaining further information should not be missed. It is therefore hoped that the following account not only will be helpful in the diagnosis of cases in other areas but will also stimulate further epidemiological investigation.

The Oxford outbreak started early in September, and cases are still being reported. Up to the present, 79 cases (in 66 children and 13 adults) have been traced. There has been an incubation period of 4 to 5 days in the majority of family contacts.

Signs and Symptoms

The onset has usually been sudden, with severe upper abdominal or lower thoracic pain. In 42 cases only upper abdominal pain has occurred; in 22 cases both abdominal and thoracic pain have been present; in 11 cases only thoracic pain has been reported. In 4 cases meningitic symptoms have predominated, but in these there has also been some abdominal or thoracic pain.

Abdominal pain has been reported more frequently among children than adults, and has commonly begun in the umbilical area and moved upwards. Thoracic pain has been reported most commonly in the lower anterior part of the chest, on either side. The pain in practically all cases has been most acute at the onset, and mothers have reported that their children have been "doubled up" by it. The pain, whether abdominal or thoracic, has been aggravated by movement, and the thoracic pain by deep breathing. The pain has been definitely spasmodic in type. Young children have usually played quite happily between attacks, although all the adults affected have reported that the pain never completely left them in the early stages.

A temperature of 102–103° F. (38.8–39.4° C.) has been common at the onset, and all cases have had some pyrexia. Patients having very severe attacks of pain have invariably had a high temperature. Vomiting has not been a prominent feature and has occurred only during the most acute attacks of pain, and diarrhoea has been absent in all cases. Sore throat has been reported in only six cases about the third or fourth day of the disease. Headache has been very severe in 16 cases; in most of these it has developed from three to four days after the onset. Where the headache has been of extreme severity photophobia and aching eyes have been prominent symptoms. Neck rigidity has been found in four patients (three adults and one child) and, from the past history, may have been present in three other cases. Convulsions occurred in one child.

One of the adults with signs of meningitis had an illness characterized by sudden onset, intermittent temperature, and increasing malaise, followed after a week by slight pain in the chest, very severe headache, photophobia, and slight neck rigidity. One direct contact of this case developed a similar attack of meningitis, while another contact developed a typical attack of Bornholm disease. These two cases of meningitis were nursed at home and no lumbar puncture was performed. The third case of meningitis was in a child who was already under observation as a contact, and who after four days of an illness typical of Bornholm disease developed meningitis and was admitted to hospital. Lumbar puncture showed a normal fluid except for a pleocytosis of 177 cells, 83% of which were lymphocytes. The father of this child has since developed a typical attack of Bornholm disease. The fourth case was in a male adult who suffered a typical attack of Bornholm disease at the same time as his stepson and four other near neighbours. He returned to work though obviously not well; nine days later he developed meningitic signs and was admitted to hospital, where lumbar puncture revealed a fluid containing protein 135 mg. per 100 ml. and cells 260, of which 75% were lymphocytes.

These four patients with definite meningitic signs are of particular interest. Such cases are described in the literature, and, in addition, references have been found to two epidemics of Bornholm disease (one in America and one in India) which have coincided with outbreaks of benign lymphocytic meningitis. It is this possible connexion which has made us wonder whether the very recent unexplained epidemic of benign meningitis in County Durham¹ had any features suggestive of Bornholm disease. It seems that similar cases of meningitis have since been identified in Cardiff and Dorset.² Only a very brief description of the Durham cases has so far been given, but there are certain features, such as incubation period and degree of infectivity, which fit in well with the outbreak we are experiencing in Oxford.

Recurrences

The duration of illness in the Oxford Bornholm outbreak has varied between one day and two weeks, but in most cases it has lasted 4 to 5 days. Several children had apparently recovered by the second or third day and returned to school, only to relapse with recurrence of the pain. Such recurrences have not occurred in children kept in bed from the start of the illness. Adults have also tended to get a recurrence of symptoms, particularly if they have attempted to get up too soon. Most children appear very debilitated at the end of the illness,

and mothers have remarked on their lack of appetite. Adults report extreme tiredness and weakness, and in those who have had very bad headache there has been complaint of some giddiness.

The outbreak was first discovered in north Oxford, but cases are now being reported from most other areas of the city. The distribution of cases is characterized by small areas of heavy incidence such as several cases in the same street, often in neighbouring houses. Within the home the disease has been very infectious, and it has been the rule rather than the exception for all the children in a household to be involved.

So far as is known there is no mortality attached to this disease, and from the point of view of the patient it consists of a relatively short but very painful illness followed by full recovery. To the doctor, however, the diagnosis may be most puzzling, and the more severe cases require differentiation from acute disease of the abdomen or chest, or possibly even from the various forms of meningitis. Treatment is symptomatic.

Some samples of blood and faeces have been obtained, and an investigation is being undertaken to try to elucidate the part, if any, played by the Coxsackie group of viruses in the aetiology of this disease.

Summary

A brief description is given of an extensive outbreak of Bornholm disease in Oxford. Cases are still occurring and details of 79 patients have so far been collected. It is considered of particular interest that at least four cases have had signs of meningitis.

We are very much indebted to the many doctors in the city who have so promptly given details of cases occurring in their practices.

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- ¹*British Medical Journal* (1951). 2, 555.
²*Ibid.* (1951). 2, 802.

Medical Memorandum

Traumatic Rupture of the Duodenum

Rupture of the first part of the duodenum by a non-penetrating abdominal injury is uncommon enough to make the following case of interest.

Case Report

A labourer aged 63 was injured at 10 a.m. on August 18, 1950. While handling a 25-cwt. (1,270-kg.) steel bed plate he was struck across the abdomen when the plate slipped from the hook of a crane and fell to the ground. The straight edge of the plate fell against his epigastrium and then slid down the front of his body to land on his feet. He sustained a fracture of his first left metatarsal, fractures of the phalanges of both great toes, and, in the fall, a crack in the lower end of his right radius.

A few minutes after the injury he noticed severe abdominal pain. He was given $\frac{1}{4}$ gr. (16 mg.) of morphine at 11.30 a.m. and sent to hospital. During the day his pulse rate remained around 60, but by evening his condition was obviously deteriorating. At 7.30 p.m. he was pale, cold, in severe pain, and slightly disorientated. His blood pressure was 130/80. The abdomen showed no external injury, but uniform tenderness and rigidity were present in all quadrants, and rectal examination showed tenderness in the recto-

vesical pouch. There was no abnormality in the urine. A diagnosis of ruptured hollow viscus was made.

At laparotomy a linear wound 1 cm. long was found on the anterior aspect of the first part of the duodenum. The tear was running across the long axis of the bowel; its edges were irregular, showing small haemorrhages and oedema. No evidence of underlying peptic ulceration was found (no history of dyspepsia was obtained later). The wound was oversewn and omental tags were sutured over the area. Exploration revealed no further injuries, and the abdomen was closed in layers with drainage.

Post-operative bronchitis with early collapse of the right lower lobe responded to penicillin and breathing exercises. His subsequent progress was entirely satisfactory, and he was discharged to the convalescent home 10 days after admission.

Comment

Rupture of the duodenum occurred in only 9% of 717 cases of closed intestinal rupture (Gage, 1902; Berry, 1921; Rowlands, 1923; Poer and Woliver, 1942). Sir Hugh Rigby (1924-5) reported a case in which a tear of the second part of the duodenum was followed by the development of a duodenal fistula, and Salisbury (1945) recorded the successful repair of an almost complete rupture at the level of the ampulla of Vater. Rupture of the duodenum following blast injury to the abdomen was reported in the recent war (Gordon-Taylor, 1942; Cameron, Short, and Wakeley, 1943).

A study of the figures provided by Battle (1919) shows that duodenal rupture is most commonly found in cases of run-over or crushing injury. It is then caused by direct compression of the bowel between the vertebral column and the injuring force, as was shown in the case described by Simpson (1950), when the ruptured duodenum was associated with pancreatic lesions clearly due to such compression. Salisbury attributed his case to a bursting injury after forcible discharge of the stomach contents into the duodenum, and it seems likely that the lesion described above was of this nature, the injury being confined as it was to the unsupported anterior aspect of the duodenum. In repairing the wound traction downwards and to the left on the stomach did not markedly enlarge the opening, as would be expected if the lesion had been a tear due to forcible displacement of the stomach.

It is interesting to note in this case the delay in diagnosis caused by the administration of morphine before admission and by the failure of the pulse rate to rise during the period of observation in the ward. Pre-occupation with his bony injuries also served to delay recognition of the seriousness of his abdominal complaints.

I wish to thank Mr. F. F. R. Martin for permission to publish this case.

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