EMERGENCIES IN GENERAL PRACTICE

ACUTE FOOD-POISONING

BY

CHRISTOPHER HARDWICK, M.D., F.R.C.P.

Physician, Guy's Hospital

Single cases and outbreaks of food-poisoning still occur with some frequency, especially in the holiday season. If the general level of personal and public hygiene was high enough no doubt these infections would cease, but it will be a very long time before this desirable state is reached. We must therefore continue to recognize and treat each case as it occurs.

Aetiology

The symptoms in all patients are very similar, but aetiologicaly two types can be recognized. In *toxic food-poisoning* the food is either poisonous in itself and is eaten by mistake, or the food is heavily contaminated by a poison, usually a bacterial toxin. Thus the toadstool fly agaric (*Amanita phalloides*) may be eaten instead of field mushrooms (*Agaricus campestris*), or the food may be infected with bacteria, especially staphylococci, which multiply and produce an exotoxin. Subsequent cooking may kill the bacteria but their poisons remain.

In *infective food-poisoning* the food is heavily infected by pathogenic organisms of the salmonella group, and it is the multiplication of these within the patient which gives rise to the illness. Typhoid and paratyphoid fevers come into this category, but as there is a long incubation period between the ingestion of the bacilli and the development of the disease they do not concern us here.

Protein is essential for bacterial growth, and so meat, fish, and milk are particularly likely to cause trouble. Sausages and any processed meats rightly have bad reputations as vectors of food-poisoning. Their preparation gives room for infection by cooks who may be carriers, and the mixing required makes it very easy for an unscrupulous maker to introduce cheap tainted meat into them. After they are made the sausages may only be smoked or very inadequately cooked before they are eaten. An outbreak of trichiniasis at the start of the second world war was attributed to the practice which was common amongst work-people of a midland town of taking sandwiches to work which were filled with raw sausage-meat. Tinned foods did have a bad reputation, but with modern methods of canning the danger has largely gone; infection of the meat after a tin has been opened may, however, still occur. Recently duck eggs have come under a cloud; organisms of the salmonella group may infect the birds or may penetrate the eggs after they have been laid.

Symptomatology

Abdominal pain, vomiting, and diarrhoea occur in both types of food-poisoning. In the toxic form these symptoms may occur within a few hours of the food having been eaten. In the infective type some time must elapse before the bacteria, growing within the host, cause trouble, and so symptoms may be delayed for two or three days.

Although several people may have eaten the tainted food only one may develop symptoms of food-poisoning. The occurrence of the illness in a single member of a family does not therefore exclude the diagnosis. Children are particularly likely to be affected. Amongst adults those who have eaten the contaminated food on an empty stomach will suffer the worst. It is possible to see all gradations of the disease in the members of a family. The younger children may have a severe gastro-enteritis whilst the elder children may only vomit a few times. The parents may have a few hours of abdominal colic with one or two loose stools.

Vomiting is usually the first symptom. It occurs frequently and after a time streaks of bright blood may be brought up. Anything taken by mouth is immediately returned, and in a severe case the patient may become shocked and collapsed. The abdominal pain is colicky in nature and is usually situated in the centre of the abdomen. If vomiting is severe there will in time be soreness in the epigastrium. Similarly, when diarrhoea is frequent there may be pain and tenderness over the colon. Diarrhoea usually starts a little after these two symptoms. Frequent watery stools may be passed and in a severe case blood and mucus.

The general disturbance will vary in degree. It is usually most pronounced in children, but in a severe infection even adults may become acutely ill. The temperature rises to about 100° F. (37.8° C.), and there may be headache and pains in the limbs. Frequent vomiting and the passage of many watery stools can easily lead to dehydration. The patient's pulse rate rises, he becomes increasingly restless, and finally collapses with a rapid thready pulse, cold extremities, and ashen-grey colour.

Differential Diagnosis

When there is an outbreak of food-poisoning the diagnosis in each sufferer should not be difficult. In isolated cases, however, there may be considerable difficulty in diagnosis, particularly before diarrhoea has started. Acute intestinal obstruction and acute appendicitis must both be excluded. The rare possibility that the patient is not suffering from food-poisoning but from the effects of some irritant poison, such as arsenic, deliberately introduced in the food must also be remembered.

Outbreaks of bacillary dysentery, the infecting organism being *Shigella sonnei*, occur occasionally. Mental hospitals and, less often, children's homes still provide the bulk of these cases, but workers in such institutions may carry the infection to their homes. Adults are seldom very ill with Sonne dysentery, but babies and toddlers suffer severely.

Treatment

Acute food-poisoning may be of varying severity even though the patients are infected at the same time. For purposes of treatment it is useful to regard the cases as falling into two groups—mild or severe. Mild cases recover rapidly and need only symptomatic measures. Severe cases require urgent treatment, and the patient may die despite everything that is done for him. Such a division is not rigid, for a patient who is seen early may be thought to have only a mild infection, whereas a few hours later it may be obvious that the infection is severe.

Previously healthy adults will usually withstand even a severe attack of food-poisoning successfully. In elderly people, however, particularly if they have disabilities such as coronary atherosclerosis or nephritis, the outlook may not be so good and their admission to hospital may be advisable. This is also true for children, particularly below the age of 2 years. At this age the reserves of body fluids are small and the margin between hydration and dehydration is narrow. A few hours of vomiting may be enough to cause severe symptoms. If, therefore, the practitioner is in any doubt about the severity of an attack of food-poisoning in a child, it is best to recommend its immediate removal to hospital.

Mild Cases

Mild cases of acute food-poisoning recover most quickly if the patient is in bed. If there are children in the house-

hold, rest in bed should be insisted upon, especially if there is any suspicion that the infection might be dysenteric. A hot-water bottle, wrapped in a piece of flannel or put inside an old sweater, will relieve the abdominal pain. Despite his vomiting, the patient should take warm drinks as often as possible. These may consist of water, milk and water, or fruit juice with added sugar. An alkali which will not cause alkalosis, such as aluminium hydroxide or magnesium trisilicate in doses of 2 dr. (8 g.), will help if the gastritis is extensive. The former has the advantage that it is constipating and so will help to relieve the diarrhoea. Other mixtures which may be used include: mist. kaolin., *B.P.C.*, $\frac{1}{2}$ oz. (14 ml.) four-hourly; or mist. kaolin. et morph., *B.P.C.*, $\frac{1}{2}$ oz. 14 ml.) eight-hourly; this contains approximately 1/65 gr. (1 mg.) of anhydrous morphine. Mist. cret. aromat. c. opio, *B.P.C.*, $\frac{1}{2}$ oz. (14 ml.) eight-hourly, is another useful mixture; this contains 10 min. (0.6 ml.) of tincture of opium in each dose, which is equivalent to about 1/9 gr. (7 mg.) of anhydrous morphine.

Even though the headache and the generalized pains may be severe, aspirin is best avoided, for it is known to be a gastric irritant, especially when taken on an empty stomach. In its place Dover's powder (pulv. ipecac. et opii), 10 gr. (0.65 g.), may be given.

Severe Cases

In severe food-poisoning symptomatic measures will still be required, but, in addition, dehydration and shock as well as bacterial infection may have to be dealt with. Rest and warmth should be given, with full nursing care. The chalk and opium mixture will be required, to try to quieten the intestinal unrest. Owing to the excessive vomiting, feeding by mouth may be very difficult, but if possible the patient should be given small quantities of boiled water, to each pint (say half a litre) of which has been added $\frac{1}{2}$ oz. (15 g.) of castor sugar and $\frac{1}{2}$ dr. (4 g.) of salt.

Dehydration and the consequent shock are shown by a diminishing output of urine, a rising pulse rate, and a falling blood pressure. All these can be measured, so that the appropriate steps can be taken before the patient becomes grey and sunken, with cold extremities and delirium. Intravenous infusion will be required to replace the water and chlorides which have been lost in the faeces and the vomit. In the absence of laboratory facilities, a mixture of equal quantities of normal saline and isotonic glucose solution should be used, in quantities sufficient to enable the patient to pass a pint of urine in every eight hours.

Intravenous infusion is a rapid and effective way of restoring body fluids. It is, however, a very artificial method and both the quantity and the rate of infusion must be carefully controlled. When fluid is given by mouth the patient can regulate its absorption and excretion so that the circulation is not overloaded. When the intravenous route is used the volume of circulating fluid is immediately increased. If this goes too far, then the patient will become waterlogged, the heart will suffer, and his condition may be as bad or even worse than when he was dehydrated. This will be especially so in children, in whom the volumes of fluid required are less, and in old people, whose myocardium may be unhealthy.

It is impossible to give a definite figure for the quantity of fluid that may be needed. In a severe case 3 to 4 pints (1.5 to 2 litres) may have to be given as quickly as possible to combat the acute symptoms. Once these have been overcome the infusion can be given more slowly, say a pint (0.5 litre) every four hours. The aim should be to correct the acute symptoms and then to give the patient enough fluid to replace that lost during the previous 24 hours in the vomit, urine, and faeces, with the addition of 2 pints (1 litre) to make up for the fluid lost through the skin and lungs. As soon as the patient has ceased to vomit the infusion should be stopped and feeding by mouth begun again. Overloading of the circulation is shown by restlessness, increasing pulse rate, and finally by the appearance of moist sounds at the lung bases.

If the food-poisoning is of the toxic variety then chemotherapy can be of no help. If the disease is infective one of the sulphonamides which are poorly absorbed and which will remain in the intestine to deal with the salmonella organisms should be used. At least 18 g. of sulphaguanidine a day should be given: an initial dose of 6 g. and then 3 g. four-hourly for three or four days. If succinylsulphathiazole is used the dose can be less, but at least 10 g. should be given each day: an initial dose of 4 g., then 2 g. every four hours for four days.

Next article on Emergencies in General Practice.—
"Severe Asthma," by Dr. A. Margaret C. Macpherson.

Refresher Course Book.—Copies of the second volume of collected articles from the Refresher Course for General Practitioners published in the *Journal* are still available at 25s. (postage 1s.) each. The volume contains 60 articles, all of which were revised by their authors for publication in the book. The first volume is now sold out and out of print. Copies of the second volume may be obtained from the Publishing Manager, B.M.A. House, Tavistock Square, London, W.C.1, or through any bookseller.

Nova et Vetera

A POST-MORTEM POPULATION SURVEY FOR ARTHRITIS

Surveys to discover the incidence of certain disease groups in selected samples of the population are becoming increasingly popular, and an investigation of this kind was recently conducted in a Midland town to estimate the frequency of osteoarthritis. The unique opportunity has recently been taken of carrying out a survey for a similar purpose on the *skeletons* of the entire male population of the town and region of Visby, which is situated on the island of Gotland, off the coast of Sweden. The population in question was slaughtered by invading Danes in the year A.D. 1361, the bodies being thrown into a common grave, which was recently opened and examined by Dr. Bo. E. Inglemark, of the Department of Anatomy of the University of Upsala.

A detailed examination was made of the 1,085 skeletons which were found in this common grave at the site of the slaughter (later dignified with the name of a battle)*. It was reported that "a good many morbid processes could be established in this material. Thus many of the vertebrae showed more or less pronounced spondylosis deformans," occurring mostly in the spines of middle-aged and elderly victims. Pott's disease was found in four cases, and some other joints were also found to have been the site of a tuberculous infection, and Dr. Inglemark gives a photograph of a knee-joint ankylosed as the result of this process. There also occurred "a fairly large number" of degenerative osteoarthritic joints. Hip-joints were affected in this way in 20 cases—"malum coxae senilis"—and one advanced case is illustrated. This disease had also occurred in about 25 cases in the elbows and wrist-joints. He points out that these people were obviously quite unfit for war service, and suggests that the cause of this rather high incidence of arthritic change may perhaps have been due to the hard work which they had to perform on the land, as they were mostly feudal peasants.

W. S. C. COPEMAN.

*Dr. Inglemark's findings are published as chapter 4 (pp. 149-209) of *Armour from the Battle of Wisby* (1939), vol. 1, by Bengt Thordeman.