بسم الله الرحمن الرحيم
Cholera, caused by Vibrio cholerae serotype 01, is the archetype bacterial cause of acute watery diarrhoea. Following its origin in the Ganges valley, devastating epidemics have occurred, often in association with large religious festivals, and pandemics have spread world-wide. The seventh pandemic, due to the El Tor biotype, began in 1961 and spread via the Middle East to become endemic in Africa. In 1990 it reached Peru and spread throughout South and Central America.
Since August 2000 there has been a massive outbreak in South Africa. El Tor is more resistant than classical *Vibrio*, and causes prolonged carriage in 5% of infections. A new classical toxigenic strain, serotype 0139, established itself in Bangladesh in 1992 and started a new pandemic.
Infection spreads via the stools or vomit of symptomatic patients or of the much larger number of subclinical cases. It survives for up to 2 weeks in fresh water and 8 weeks in salt water. Transmission is normally through infected drinking water, shellfish and food contaminated by flies, or on the hands of carriers.
Clinical features

Severe diarrhoea without pain or colic begins suddenly and is succeeded by vomiting. Following the evacuation of normal gut faecal contents, typical 'rice-water' material is passed consisting of clear fluid with flecks of mucus. Classical cholera produces enormous loss of fluid and electrolytes, leading to intense dehydration with muscular cramps. Shock and oliguria develop but mental clarity remains. Death from acute circulatory failure may occur rapidly unless fluid and electrolytes are replaced. Improvement is rapid with proper treatment.
The majority of infections, however, cause mild illness with slight diarrhoea. Occasionally, a very intense illness, 'cholera sicca', occurs, with loss of fluid into dilated bowel, killing the patient before typical gastrointestinal symptoms appear. The disease is more dangerous in children.
Clinical diagnosis is easy during an epidemic. Otherwise the diagnosis should be confirmed bacteriologically. Stool dark field microscopy shows the typical 'shooting star' motility of *V. cholerae*. Rectal swab or stool cultures allow identification. Cholera is notifiable under international health regulations.
Management

Maintenance of circulation by replacement of water and electrolytes is paramount. Early intervention improves prognosis. A clinical assessment of dehydration is made from the appearance of the patient. Oral rehydration solution (ORS) is effective and safe for all but the most severely dehydrated patients. The addition of resistant starch to ORS reduces faecal fluid loss and shortens the duration of diarrhoea in adolescents and adults with cholera.
The effect is caused by enhanced sodium absorption in the colon due to short-chain fatty acids produced in the colon from non-absorbed carbohydrates. Ringer-Lactate is the best fluid for intravenous replacement. Vomiting usually stops once the patient is rehydrated, and fluid should then be given orally up to 500 ml hourly. The fluid required is calculated every 8 hours from the urine volume, stool and vomit output, and estimated insensible loss (as much as 5 litres/24 hours in a hot humid climate). Total fluid requirements may exceed 50 litres over a period of 2-5 days. Accurate records are greatly facilitated by the use of a 'cholera cot' which has a reinforced hole under the patient's buttocks beneath which a graded bucket is placed.
In children careful attention to fluid balance is required; they are prone to hypoglycaemia. Three days' treatment with tetracycline 250 mg 6-hourly, a single dose of doxycycline 300 mg or ciprofloxacin 1 g in adults all reduce the duration of excretion of *Vibrio* and the total volume of fluid needed for replacement.
Prevention

Strict personal hygiene is vital and drinking water should come from a clean piped supply or be boiled. Flies must be denied access to food. Parenteral vaccination with a killed suspension of *V. cholerae* may provide limited protection. Oral vaccines containing killed *V. cholerae* and the B subunit of cholera toxin are available but are of limited efficacy.
In epidemics public education, and control of water sources and population movement are vital. Mass single-dose vaccination and treatment with tetracycline are valuable. Disinfection of discharges and soiled clothing, and scrupulous hand-washing by medical attendants reduce the danger of spread.
VIBRIO PARAHAAEMOLYTICUS

This marine organism produces a disease similar to enterotoxigenic *E. coli*. It is acquired from raw seafood and is very common where ingestion of such food is widespread (e.g. Japan). After an incubation period of approximately 20 hours, explosive diarrhoea, abdominal cramps and vomiting occur. Systemic symptoms of headache and fever are frequent but the illness is self-limiting, taking 4-7 days to resolve. Rarely, a severe septicaemic illness arises. If *Vibrio* infection of this nature is suspected, the laboratory ought to be notified since specific halophilic culture requirements apply.
THANK YOU FOR LISTENING