Infectious diarrhoea: Bacillary dysentery (Shigellosis)

The majority of diarrhoeal disease results from enteric infection and is generally a short-lived self-limiting condition. It is a worldwide problem that causes mortality and morbidity, especially in young children.

Introduction

Infections of the gastrointestinal tract are among the commonest infections in all communities of the world. There is a little doubt that they cause the greatest morbidity and mortality. Note that most not all cases of diarrhoea are due to infection. Alternative names for diarrhoea include Watery stools, frequent bowel movements; loose bowel movements; “the runs”.

Four clinical types of diarrhoea can be recognized, each reflecting the basic underlying pathology and altered physiology:
- Acute watery diarrhoea (including cholera), which lasts several hours or days, the main danger is dehydration; weight loss also occurs if feeding is not continued.
- Acute bloody diarrhoea, which is also called dysentery: the main dangers are intestinal damage, sepsis and malnutrition; other complications, including dehydration, may also occur.
- Persistent diarrhoea, which lasts 14 days or longer: the main danger is malnutrition and serious non-intestinal infection; dehydration may also occur.
- Diarrhoea with severe malnutrition (marasmus or kwashiorkor); the main dangers are: severe systemic infection, dehydration, heart failure and vitamin and mineral deficiency.

The management of each type of diarrhoea should prevent or treat the main danger(s) that each presents.

Bacterial organisms that cause diarrhoea include:

Common infections: Campylobacter sp., Salmonella sp., Shigella sp., Escherichia coli, Clostridium perfringens, Helicobacter pylori.

Uncommon or rare infections: Aeromonas sp., Vibrio parahaemolyticus, Plesiomonas sp., Yersinia sp., Clostridium difficile, Vibrio cholera.

Bacteria which elaborate toxins: Staphylococcus aureus, Bacillus cereus, Clostridium botulinum.

The main enteropathogenic bacteria with some characteristics of the epidemiology of the diseases caused are shown in Table 1.

It is clear that there are many different bacteria, which can cause diarrhoea. This article will deal mainly with bacillary dysentery (shigellosis).

Bacillary dysentery (shigellosis)

Shigellae cause bacillary dysentery; an important worldwide disease. This form of infectious diarrhoea is an important cause of death and morbidity in young children, especially in the Third World. It is often self-limiting and mild but occasionally serious, particularly in the first 3 years of life. Poor sanitary conditions promote the spread of Shigella. The prolonged diarrhoea and fever of shigellosis greatly exacerbate malnutrition.

Definition

Shigellosis is one of the infectious diarrhoeal diseases that occur due to bacterial infection (Shigella species). Four species of shigellae can cause diarrhoea, but Shigella dysenteriae can cause the most serious form of illness.

Transmission of shigellae (epidemiology)

Shigellosis is spread from person to person by the faecal-oral route. So the reservoir of infection is the human gut. The excretion of the organism will be in the faeces, but after an acute attack, proportions of patients continue to excrete shigellae for some time (i.e. for weeks, sometimes months). Patients with acute dysentery, however, are the most dangerous sources of infection, doubtless due to the large numbers of shigellae excreted during the acute phase of the disease.

Route of infection is faecal-oral either directly or via contaminated equipment, towels and lavatory seats (in nursery schools). Shigellae can remain viable for long periods of time in cool, moist environments.

‘Food, flies, fomites’ are the classical means of spread of dysentery; contaminated water can also be a source of infection. An incident due to contaminated iceberg lettuce affected several European countries during 1994. The peak incidence is in children under 5 years of age.

Essentials for diagnosis

- Diarrhoea, often with blood and mucus.
- Cramps.
- Fever, malaise, prostration, clouded sensorium.
- Pus in stool, organism isolated in stool culture.

The clinical syndrome of bloody diarrhoea with colic usually indicates a diagnosis of dysentery. Bacillary dysentery must be distinguished from amoebic dysentery and inflammatory bowel
<table>
<thead>
<tr>
<th>Organism</th>
<th>Usual source</th>
<th>Common mode of spread</th>
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</thead>
<tbody>
<tr>
<td>Campylobacter</td>
<td>Animal gut</td>
<td>Poultry; meat; milk</td>
</tr>
<tr>
<td>Salmonella species</td>
<td>Animal gut</td>
<td>Poultry; meat; milk</td>
</tr>
<tr>
<td>Shigella species</td>
<td>Human gut</td>
<td>Faecal - oral or via food, fomites</td>
</tr>
<tr>
<td>Escherichia coli</td>
<td>Human gut</td>
<td>Faecal - oral or via food, water, fomites</td>
</tr>
<tr>
<td>Staphylococcus aureus</td>
<td>Septic lesions on food handlers</td>
<td>Cooked meats; diary products</td>
</tr>
<tr>
<td>Clostridium perfringens</td>
<td>Animal gut</td>
<td>Stews; meat pies</td>
</tr>
<tr>
<td>Bacillus cereus</td>
<td>Environment (soil)</td>
<td>Rice</td>
</tr>
<tr>
<td>Clostridium difficile</td>
<td>Human gut</td>
<td>Overgrowth of strains already in colon; also faecal - oral</td>
</tr>
<tr>
<td>Yersinia enterocolitica plus</td>
<td>Animal gut</td>
<td>Faecal - oral; via food, water</td>
</tr>
<tr>
<td>Yersinia pseudotuberculosis</td>
<td>Human gut</td>
<td>Water; food</td>
</tr>
<tr>
<td>Vibrio cholera</td>
<td>Human gut</td>
<td></td>
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</tbody>
</table>

Laboratory findings: The white blood count shows an increase in polymorphonuclear cells (12-16x10⁹/l). The stool shows blood, mucus, and pus. Stool culture is positive for Shigella.

Complications
Dehydration, acidosis, and electrolyte imbalance occur in infancy. Temporary disaccharidase deficiency may follow the diarrhoea. Arthritis is an uncommon complication.

Management
Mild shigelllosis requires only symptomatic treatment. Antispasmodic agents are helpful in relieving colic. In more severe cases, antibiotic treatment can terminate the illness, though it often takes 2 to 3 days for diarrhoea to cease completely. Ciprofloxacin is often successful, and tends to eliminate excretion as well as curing the disease.

Prevention and control
Prevention of infection can be made by providing facilities for safe disposal of faeces and clean water for hand washing, together with education on good hygiene. Shigelae dysentery is notifiable. Cases should be excluded from handling food until their stools are clear of organisms.

References