Gastroenteritis in adults and older children

Gastroenteritis is a nonspecific term used to describe a condition in which there is a combination of nausea, vomiting, diarrhoea and abdominal pain. The term is usually taken to mean those of infectious origin. See also the separate Gastroenteritis in Children article.

Epidemiology

- Gastroenteritis is caused by a variety of viral (eg, norovirus, rotavirus and adenovirus), bacterial (eg, Campylobacter., Escherichia coli O157, Salmonella., Shigella., or toxins from *Staphylococcus aureus*, *Bacillus cereus* or Clostridium perfringens) and parasitic pathogens (eg, Cryptosporidium., (amoebiasis) or Giardia lamblia).
- Gastrointestinal infections cause an estimated 17 million cases in the UK each year. Bacterial gastroenteritis is particularly common in summer months and outbreaks of zoonotic infections, such as campylobacteriosis, salmonellosis and Shiga toxin-producing *E. coli* (STEC) occur every year. Fever and diarrhoea can be symptoms of COVID-19 infection, and during the pandemic, some cases may have been mistaken for gastroenteritis and vice versa [1] .
- Viral infections cause 30-40% of gastroenteritis cases in industrialised countries. The figure is higher for children. Norovirus is the most common cause of viral infectious gastroenteritis in adults in England and Wales. Adenovirus and rotavirus are much less common in teenagers than in younger children. There has been a reduction in disease prevalence since the introduction of the rotavirus vaccine [2] .
- The 2014 Ebola virus outbreak was one of the largest Ebola outbreaks in history and the first in West Africa.

- The causative agent for most cases of gastroenteritis is never isolated and the responsible agent never diagnosed. Management is not usually dependent upon cause.

Risk factors

- Poor personal hygiene and lack of sanitation increase the incidence.
- A compromised immune system leaves the patient vulnerable to gastroenteritis - eg, AIDS.
- Achlorhydria increases risk, especially for *Salmonella* spp. and *Campylobacter* spp. Achlorhydria may also result from acid-suppressing drugs.
- Infection may arise from poorly cooked food, cooked food that has been left too long at room temperature or from uncooked food such as shellfish. Insufficient reheating of food not only fails to kill bacteria but may speed up multiplication and increase the bacterial load ingested. Even if reheating of cooked food kills bacteria, enterotoxins such as staphylococcal exotoxin, are not destroyed.

Presentation

The history may well give an indication of cause. The incubation period for viruses is usually about a day, for bacillary dysentery a few hours to four days and for parasites seven to ten days.

- Epidemics in this country are usually caused by a rotavirus but norovirus is a common cause of 'winter vomiting'.
- Bloody diarrhoea should arouse suspicion of bacterial infection, especially *E. coli* O157 or, after return from an exotic location, it may be *E. histolytica*. *Salmonella* spp. is also a possibility.
- Pyrexia in adults often suggests an invasive organism as the cause, although many other illnesses can induce fever and diarrhoea, especially in children who generally are febrile with any type of infective gastroenteritis.

Assessment[2]

- Check temperature, blood pressure, pulse rate and respiratory rate.

- Perform a thorough abdominal examination, particularly to consider other possible diagnoses - eg, appendicitis.
- Assess for features of dehydration:
    - Mild dehydration: lassitude, anorexia, nausea, light-headedness, postural hypotension.
    - Moderate dehydration: apathy, tiredness, dizziness, muscle cramps, dry tongue, sunken eyes, reduced skin elasticity, postural hypotension (systolic blood pressure >90 mm Hg), tachycardia, oliguria.
    - Severe dehydration: profound apathy, weakness, confusion (leading to coma), shock, tachycardia, marked peripheral vasoconstriction, systolic blood pressure <90 mm Hg, oliguria or anuria.

Investigations[2]

- Stool investigations - microscopy (include ova, cysts and parasites), culture and sensitivity:
    - A stool sample should be sent for microbiological investigation if:
        - There is acute painful diarrhoea or blood, mucus and/or pus in the stool (suggesting possible dysentery, such as caused by STEC infection O157, particularly in children.
        - The patient is systemically unwell or immunocompromised.
        - The person has had recent antibiotic or proton pump inhibitor treatment, or recent hospital admission (to exclude *Clostridium difficile* infection).
        - There is suspected food poisoning.
        - The patient has recently been abroad to anywhere other than western Europe, North America, Australia or New Zealand. Three additional specimens (5 mL each) should be sent for ova, cysts, and parasites 2-3 days apart to exclude parasite infection.
        - The diarrhoea is recurrent, has not improved by day seven, or has not resolved by day fourteen.
        - There is uncertainty about the diagnosis of gastroenteritis.

- - There is diarrhoea in a person at risk of transmission of infection, such as:

    - A food handler working with or serving unwrapped ready-to-eat food and drink.
    - Clinical, social care, or nursery staff who work with young children, the elderly, or any other particularly vulnerable people.
    - Any person who is unable to perform adequate personal hygiene due to lack of capacity or ability to comply.
    - All children aged 5 years or under (up to the sixth birthday) who attend school, pre-school, nursery, or other similar childcare or child minding groups (due to the increased risk of *E. coli* infection O157).

- Unwell patients may need blood tests - eg, FBC, renal function and electrolytes.
- Other tests will depend on the clinical scenario - eg, bowel distension requires imaging.

Differential diagnosis

Not all diarrhoea or vomiting is gastroenteritis and other causes must be considered. The following list is far from complete; however, it gives some other causes of diarrhoea or vomiting but not usually both. See also the separate Chronic Diarrhoea in Adults article.

- Traveller's diarrhoea.
- Urinary tract infection.
- Constipation with overflow.
- Gastritis, perhaps from non-steroidal anti-inflammatory drug (NSAID) or alcohol abuse.
- Hyperemesis gravidarum or, in late pregnancy, pre-eclampsia/eclampsia.
- Inflammatory bowel disease.

- Addison's disease.

Notification

Both dysentery and food poisoning are notifiable diseases. The laboratory may report the isolation to the relevant authority but it is better to duplicate notification than to overlook it. Notification is a statutory duty.

Management[2]

Management in Primary Care

The aims of management may be summarised as to identify the extent of dehydration and to treat accordingly and to educate patients in the management and prevention of gastroenteritis - eg, hand washing.

- Provide advice on sources of support and information - eg patient information leaflets.
- Advise on how to monitor fluid intake and prevent/treat dehydration.
    - In healthy adults, encourage regular fluid intake, and supplement with fruit juice and soups if needed.
    - If an adult is at increased risk of dehydration (such as the elderly, immunocompromised, those with co-morbid conditions or concurrent illness), advise on the use of oral rehydration salt (ORS) solution as supplemental fluid.
    - In adults with clinical features of dehydration who can safely be managed at home, advise to use ORS solution frequently and in small amounts, such as 200-400 mL to be given after every loose motion, dose according to fluid loss, to rehydrate the person.
    - After rehydration, the usual diet may be gradually introduced. Small, light, non-fatty, non-spicy meals may be better tolerated.

- Drug treatment with antidiarrhoeal (or antimotility) drugs, antiemetics, and probiotics is *not* routinely recommended for use in adults in primary care:

    - Antidiarrhoeal drugs may be useful for symptom relief in adults with mild-to-moderate diarrhoea - for example, if rapid resolution is required to enable the person to resume essential activities. They are available to buy over-the-counter, but should *not* be used if a person has:

        - Blood, mucus, and/or pus in the stools or high fever (suggesting possible dysentery).
        - Shigellosis or confirmed, probable or suspected STEC O157 infection, following stool culture [3] and sensitivity testing.

- Antibiotics should not be routinely be prescribed. They should be reserved for treatment of confirmed microbial pathogens, if appropriate following stool culture and sensitivity, and if necessary after discussion with the local health protection team.
- Advise on methods to prevent transmission of infection:

    - Wash hands thoroughly with liquid soap in warm running water, and dry carefully.
    - Always use a flush toilet, if possible. If a commode or bedpan is used, it should be handled with gloves, the contents disposed of into the toilet, and the container then washed with hot water and detergent and allowed to dry. Appropriate hygiene measures should be maintained with hands, equipment and surfaces.
    - Towels and flannels used by the infected person should not be used by other household members.
    - Wash soiled clothing and bed linen separately from other clothes and at a high temperature (for example 60°C or higher for cotton), after removal of excess faecal matter or vomitus into the toilet. Soaking in disinfectant is not necessary. The washing machine should not be more than half full to allow for adequate washing and rinsing.

- The person should be advised not to attend work or other institutional/social settings until at least 48 hours after the last episode of diarrhoea or vomiting:
    - **NB**: for some gastrointestinal infections, longer periods of exclusion are needed, and 'microbiological clearance' with negative stool testing may be required before return to specific settings. Specialist advice may be required.
    - **NB**: if cryptosporidiosis or giardiasis is suspected or confirmed, the person should not go swimming for two weeks after the last episode of diarrhoea.
- Advise the person/carers on the need for follow-up and to seek urgent medical advice if there are:
    - Any features requiring hospital admission or assessment.
    - Any new features requiring stool culture testing, such as blood, mucus, and/or pus in the stool (suggesting possible dysentery).
    - Symptoms that do not resolve within the expected timeframe, such as diarrhoea that has not resolved by day 7. Stool culture testing will be required and consideration should be given to alternative diagnoses.
- Notify the local health protection team immediately by completing a notification form, if any of the following notifiable diseases or organisms is suspected:
    - Food poisoning (such as suspected *B. cereus*, *Campylobacter* spp., *C. perfringens*, *Cryptosporidium* spp., *E. histolytica*, verocytotoxigenic *E. coli* (including *E. coli* O157:H7), *Salmonella* spp., *G. lamblia*, and *Yersinia pestis*), including suspected clusters or outbreaks.
    - Haemolytic uraemic syndrome.
    - Infectious bloody diarrhoea, such as *Shigella* spp.
    - Enteric fever (typhoid or paratyphoid fever).
    - Cholera.

When should hospital admission be considered?[2]

- Arrange emergency admission to hospital if the patient is vomiting and unable to retain oral fluids, or there are features of sepsis or severe dehydration.
- Other factors when considering admission include inadequate response to oral rehydration salts, recent foreign travel, older age, poor home circumstances and low level of support, fever, bloody diarrhoea, abdominal pain and tenderness, faecal incontinence, diarrhoea lasting more than seven days, co-existing medical conditions and drug therapy (eg, systemic steroids, angiotensin-converting enzyme (ACE) inhibitors, diuretics).

Complications[2]

The risk of complications from gastroenteritis is greatest at the extremities of life, in people with concurrent chronic disease and in those who are immunocompromised. Complications include:

- Dehydration and electrolyte disturbance.
- Haemolytic uraemic syndrome (HUS), which is rare. HUS is characterised by acute kidney injury, haemolytic anaemia and thrombocytopenia. It occurs mostly in young children and the elderly.
- Reactive complications - eg, arthritis, carditis, urticaria, erythema nodosum, conjunctivitis and reactive arthritis. They are associated with Salmonella., Campylobacter., *Yersinia enterocolitica* and Shigella. infections. There are usually no reactive complications associated with viral or parasitic gastroenteritis.
- Systemic invasion by *Salmonella* spp. may cause endovascular infections and localised infections in bones, joints, meninges, or in the gallbladder.
- Toxic megacolon caused by fulminant colitis is rare.
- Guillain-Barré syndrome is associated with a number of viruses, especially cytomegalovirus (CMV), but *Campylobacter jejuni* has been the most commonly isolated pathogen in several studies[4] .
- Malnutrition.

- Intractable diarrhoea: may (rarely) require long-term parenteral nutrition.
- Thrombotic thrombocytopenic purpura (TTP) primarily affects adults infected with STEC, and can present with fever, flu-like symptoms, petechial haemorrhages on the lower limbs, haematuria, anaemia, renal dysfunction, and possible neurological deficit.
- Irritable bowel syndrome.
- Secondary lactose intolerance
- Reduced absorption of drugs such as anticonvulsants or oral contraceptives may occur.
- Aortitis and osteomyelitis may be associated with *Salmonella* spp. and *Yersinia* spp. infection.
- Inflammatory bowel disease may occur following non-typhoidal salmonella, *Campylobacter* spp., and *C. difficile* infection.

Infants, the elderly and those with immunological compromise are more likely to have more severe disease and to require admission to hospital for rehydration. In severe cases hypovolaemic shock and even death can occur.

Prognosis

- Usually there is an uneventful recovery. Risk is greatest at the extremes of life and in those with immunocompromise. In England and Wales between 2001-2006, 20% of deaths in persons >65 years of age caused by infectious intestinal disease other than *C. difficile* were associated with norovirus infection [5] .
- In developing countries, gastroenteritis is a leading cause of death. In November 2014, the total reported number of deaths in West Africa due to the Ebola virus was 5,420 [6] .

Prevention

- Meats should be properly cooked. Vegetables and salads should be thoroughly washed before eating.

- Uncooked meats should be kept separate from cooked and ready-to-eat food, to avoid cross-contamination.
- Chopping boards, knives and other utensils should be washed thoroughly in hot soapy water immediately after handling any raw meat.
- Hands should be washed before handling different food items and eating or drinking and after going to the toilet or handling pets. Effective use of hand washing could prevent many cases[7] .

Further reading

- Infectious diarrhoea - the role of microbiological examination of faeces; Quick Reference Guide for Primary Care
- Skyum F, Abed OK, Mogensen CB; Clinical information on admission is insufficient to determine the appropriate isolation regimen for acute gastroenteritis. Dan Med J. 2014 Jun;61(6):A4850.
- Ciccarelli S, Stolfi I, Caramia G; Management strategies in the treatment of neonatal and pediatric gastroenteritis. Infect Drug Resist. 2013 Oct 29;6:133-61. doi: 10.2147/IDR.S12718.

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Originally Published: 20/11/2023	Next review date: 23/07/2021	Document ID: doc_2180

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