Gastrointestinal Infections in Pregnancy

Acute gastroenteritis is the rapid onset of diarrhoea less than 14 days previously (with or without nausea, vomiting, fever, or abdominal pain). It may be caused by infections and also by non-infectious toxins in food (eg, undercooked red kidney beans). The term dysentery is used to describe loose, small-volume stools with blood and mucus, ± fever and abdominal cramps. Food poisoning, dysentery and certain specific gastrointestinal infections are notifiable diseases in the UK.

See also separate Gastroenteritis in Adults and Older Children article.

Gastrointestinal infections affect the general population but their particular relevance to pregnancy is:

- Pregnant women may be more vulnerable to complications, so there should be a lower threshold for investigation, admission and treatment.
- Febrile illness in pregnancy may cause miscarriage or premature labour. Certain infections have been known to do so and research is ongoing; however, there is currently no evidence that the more common gastrointestinal infections in the UK cause miscarriage.
- In the uncommon event of progression to critical illness, there are subsequent risks to the fetus from both maternal illness and treatment.
- Acute abdominal conditions are more difficult to diagnose during pregnancy.
- Certain gastrointestinal infections can directly harm the fetus, particularly listeriosis. Listeriosis in pregnancy is rare but serious and difficult to diagnose.

Aetiology

Various bacteria, protozoa, viruses and toxins can cause acute gastroenteritis. In the UK, viruses are the most common cause. Many infections are self-limiting and relatively harmless; however, consider those which may be serious for the mother or fetus. In the scenario of a pregnant woman in the UK with acute gastroenteritis symptoms, important pathogens to consider are:

- Infections which may affect the fetus:
  - Listeriosis:
    - *Listeria* spp. is a common organism found in soil, dust, water, animal faeces and processed food. It can cross the placenta, perhaps due to its intracellular life cycle.
    - Listeriosis in pregnancy threatens the fetus and newborn through direct infection of the placenta and chorioamnionitis, and is frequently fatal.
    - Listeriosis affects around 1 in 10,000 pregnancies. Epidemics occur. It is more common in pregnancy than in the general population. Those with reduced immunity are more susceptible (eg, splenectomy, diabetes, steroid use, HIV) - but most cases occur in healthy women.
  - Salmonellosis:
    - Normally salmonella infections do not cause problems for the fetus; however, where there is disseminated infection and intrauterine sepsis there have been reports of premature delivery and neonatal infection.

- Infections which carry a higher risk of causing severe illness in the mother:
  - *Escherichia coli* O157.
  - Shigellosis (bacillary dysentery).
  - *Clostridium difficile* - consider this if there is a history of antibiotics or hospitalisation.
  - Cholera - unlikely in the UK.
  - Note that other infections can cause severe illness in immunocompromised patients - eg, *Cryptosporidium* spp.

- Parasitic infections which may require specific identification and treatment:
  - *Giardia lamblia* - may not show up on stool microscopy.
  - *Entamoeba* spp. - rare in temperate climates.

Assessment

History

- Symptoms including blood/mucus in stool, fever, vomiting, abdominal pain, oliguria.
- Any other illness; social circumstances and ability to manage oral rehydration at home.
- Travel, contact with animals, contaminated food or water.
- Fetal movements; uterine contractions.

Examination
Assess whether the patient is systemically unwell or dehydrated.
- Blood pressure.
- Examine for abdominal tenderness and any signs of an acute abdomen.
- Assess fetal well-being; establish whether there are any signs of premature labour or uterine irritability.
- Urinalysis for glucose, ketones, protein and features of urinary tract infection (blood, nitrates, leukocytes).

**Note**
- Consider important differential diagnoses such as ectopic pregnancy or acute appendicitis, where diarrhoea may be a misleading symptom (see 'Differential diagnosis', below).
- As listeriosis in pregnancy is serious and difficult to diagnose, consider it in any pregnant patient presenting with fever, especially if accompanied by flu-like or gastrointestinal symptoms.[4]

### Symptoms of *Listeria* spp. infection[4, 5]
- Most cases are mild and may even be asymptomatic for the mother.
- Fever is the most common symptom.
- Flu-like symptoms, myalgia, headache, abdominal/back pain, sore throat, vomiting/diarrhoea may also occur.
- Backache, which may be mistaken for a urinary tract infection, may be present.
- In pregnancy, there may be uterine irritability, premature labour or miscarriage.

#### Differential diagnosis
See also separate Abdominal Pain in Pregnancy article.
- **Ectopic pregnancy** (a gynaecological emergency) - symptoms include diarrhoea (due to pelvic irritation); signs can be subtle and easily missed.
- **Appendicitis** - can also present with diarrhoea/vomiting and abdominal pain; more difficult to diagnose in pregnancy.
- **Hyperemesis gravidarum**.
- **Diabetic ketoacidosis**.
- **Urinary tract infection** or **pyelonephritis**.
- **Pre-eclampsia** (may cause nausea and epigastric pain).
- **Antibiotic-induced diarrhoea.** (As a side-effect or as a risk factor for pseudomembranous colitis.)
- **Food poisoning due to toxins in food** (without infection).
- **Inflammatory bowel disease**.
- **Coeliac disease**.
Initial investigations

- Stool sample. Laboratories vary as to which infections are routinely tested for, so always put relevant clinical information on the request form, including the pregnancy, symptoms, travel history and any particular suspected pathogen. Stool samples are advised in the same situations as for non-pregnant patients:
  - Where the woman is systemically unwell,
  - Where there is a history of travel (other than to North America, Western Europe, Australia or New Zealand),
  - Where the diarrhoea is persistent,
  - Where there is a history of recent antibiotic treatment or hospitalisation.
  - If there is blood and/or pus in the stool.
  - Where there is suspected food poisoning.
  - Where the woman is immunocompromised.
  - If there is diagnostic uncertainty.

- Blood tests:
  - Renal function and electrolytes if dehydrated.
  - FBC and platelet count if there is suspected haemolytic uraemic syndrome (rare but associated with infection with *E. coli* O157).
  - Blood cultures if systemically unwell or where there is suspicion of *Listeria* spp.

- *Listeria* spp.:
  - Blood cultures are required.
  - *Listeria* spp. can also be cultured from CSF or amniotic fluid.

- Fetal assessment. Fetal heart rate can be checked with Doppler scanning, or later in pregnancy, cardiotocography (CTG) to monitor the fetal heart, and contractions may be required.
- Further tests if relevant to exclude other causes - eg, urine microscopy, abdominal ultrasound or pelvic ultrasound.

Management

General points
- Notification and infection control measures may be required.
- Most gastrointestinal infections in pregnancy only require rehydration and fetal monitoring.
- Hospital admission is required for fetal distress, premature labour or significant dehydration.
- Specific antibiotics are rarely required but may be indicated depending on the results of stool culture and advice from microbiology.

Who needs admission?
Hospital admission may be needed if there is:

- A suspected serious cause requiring investigation/treatment - eg, *Listeria* spp; *E. coli* O157.
- Moderate-severe dehydration or inability to retain oral fluids.
- Severe dehydration or shock.
- Significant co-existing illness - eg, renal impairment, inflammatory bowel disease, diabetes, immunocompromise, an obstetric problem.

Medication
This is not indicated in most cases but will depend on the suspected infection and any microbiology results.

- Loperamide is **not** recommended in pregnancy.
- Antibiotics are not routinely recommended for most cases of gastroenteritis.
Treatment of listeriosis in pregnancy[4, 5]
- Penicillin, ampicillin, and amoxicillin have been used most extensively in the treatment of listeriosis, with IV ampicillin the treatment of choice. Gentamicin may also be used in conjunction.
- Cephalosporins are NOT effective.
- If there is a true penicillin allergy, trimethoprim/sulfamethoxazole is an alternative but there is a teratogenic risk in the first trimester and a risk of neonatal haemolysis and methaemoglobinaemia in the third trimester.
- Erythromycin has also been used as a second-line option.
- Successful treatment of maternal infection can result in delivery of a healthy baby at term.

Prognosis and complications
In most cases, gastroenteritis during part of the pregnancy has no adverse effects on neonatal outcome. However, possible complications are:
- Febrile illness in pregnancy, which may possibly cause miscarriage or premature labour.
- Severe dehydration which can reduce placental blood flow.
- Listeriosis;[4, 6]
  - May cause intrauterine death or severe neonatal infection.
  - Neonatal infection can cause pneumonia, sepsis, or meningitis.
  - Neonatal presentation varies but most present around 36 hours after birth with respiratory distress, pneumonia, meningitis or sepsis. There may be a rash, known as granulomatosis infantisepticum. There can be a late-onset illness (2-3 weeks postnatally).
  - The case fatality rate for fetal or neonatal listeriosis is 10-50%.
- Salmonella spp. - the maternal prognosis is excellent; however, rarely, the fetus may be affected. There are case reports of intrauterine death, premature delivery and neonatal infection.
- Campylobacter spp. - rarely, this has been linked to fetal death, premature labour or neonatal sepsis (from case reports).[8]
- Haemolytic uraemic syndrome may complicate E. coli O157 or Shigella spp. infections.
- Ascending infection with E. coli O157 is a cause of stillbirth.[9]

Prevention[10, 11]
Prevention is key. Pregnant women should be advised to practise a high standard of food hygiene - ie:
- Do not allow frozen food from a shop to defrost before putting it into the freezer; observe the use-by dates.
- Cook all raw food fully; cook eggs until the yolk is set; chilled food must be thoroughly rewarmed. Avoid uncooked or undercooked ready meals.
- Vegetables eaten raw should be washed thoroughly.
- Regular hand-washing, especially after using the toilet, handling animals or soil and before preparing or eating food; wash hands after handling raw foods.
- Keep raw and cooked food separate (including utensils).
- Do not reheat food more than once.
Advice for preventing listeriosis:

- *Listeria* spp. can be transmitted to pregnant women via food. It has been found in a variety of foods at all stages of preparation, from raw to well-cooked left-overs, and will still grow on food that is stored in a fridge. Certain foods should be avoided:
  - Refrigerated pâté or meat spreads (canned ones may be eaten.).
  - Processed and cold meats - eg, hot dogs - unless reheated to steaming hot.
  - Unpasteurised dairy products.
  - Soft cheeses - eg, Brie, Camembert, feta and blue-veined cheeses. (Cheeses that may be eaten include hard cheeses, semi-soft cheeses such as mozzarella, pasteurised processed cheeses, such as slices and spreads, cream cheese and cottage cheese.)
  - Cold, smoked or raw seafood - eg, smoked salmon, shellfish, sashimi (canned seafood may be eaten).
- Pregnant women should not help with lambing or touch lambing products (eg, the placenta).

Prevention of traveller's diarrhoea and antibiotic-associated diarrhoea may be aided by taking probiotics - eg, lactobacilli. Evidence suggests probiotics are safe in pregnancy. However, further research is needed before advice can be given about type and dosage.

Further reading & references

- Diarrhoea - prevention and advice for travellers, NICE CKS, May 2013 (UK access only)
- Diarrhoea - adult’s assessment; NICE CKS, March 2013 (UK access only)
- British National Formulary (BNF); NICE Evidence Services (UK access only)

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