Managing **urinary tract infections** in pregnancy

Urinary tract infections (UTIs) occur commonly during pregnancy. UTIs include acute cystitis, pyelonephritis and asymptomatic bacteriuria (positive urine culture in an asymptomatic woman). Approximately 1–4 % of pregnant women experience acute cystitis and the incidence of asymptomatic bacteriuria during pregnancy ranges from 2–10 %.[1]

Many factors may contribute to the development of UTIs during pregnancy. One important factor is ureteral dilatation, thought to occur due to hormonal effects and mechanical compression from the growing uterus. Ureteral dilation can cause bacteria to spread from the bladder to the kidneys, increasing the risk of pyelonephritis.[2]

Acute cystitis in pregnancy

Women with acute cystitis commonly present with symptoms of dysuria, urgency and frequency, without evidence of systemic illness. However, these symptoms can be reported by pregnant women without acute cystitis.[3] A urine sample should be sent for culture and, in the case of a pregnant woman, empiric treatment is required while waiting for the results. Antibiotic choice should cover common pathogens and can be changed if required after the organism is identified and sensitivities are determined. The following are appropriate choices (in order of preference):

- Nitrofurantoin: 50 mg four times a day (avoid at 36+ weeks)
- Trimethoprim: 300 mg once a day (avoid in the first trimester)
- Cephalexin: 500 mg twice a day (500 mg tablets funded since September 1, 2010)

N.B. Amoxicillin is not suitable as an empiric therapy for acute cystitis but can be used if urine culture shows susceptibility.

A seven day treatment period is required to ensure eradication. Studies in non-pregnant women with acute cystitis show that treatment with antibiotics for three days is as effective as longer courses (e.g. seven to ten days), however, the risk of relapse is higher.[4] Recurrent

infections may have serious consequences for pregnant women therefore a longer course of antibiotics is used to avoid the higher rate of relapse with short courses.[4] A follow up urine culture can be requested one to two weeks after the antibiotic course has been completed to ensure eradication.

Paracetamol can be used to relieve pain associated with acute cystitis.[5] Other measures to relieve symptoms such as increasing fluid intake, urinary alkalinisation products and cranberry products are not recommended because evidence of their effectiveness is lacking and some products may interact with antibiotic treatment.[1]

Asymptomatic bacteriuria in pregnancy

Asymptomatic bacteriuria during pregnancy has been associated with an increased risk of pre-term delivery and low birth weight. In addition, if untreated, 20–40% of pregnant women with asymptomatic bacteriuria may develop pyelonephritis later in pregnancy.[6] Antibiotic treatment for asymptomatic bacteriuria is therefore indicated in pregnant women to reduce the risk of pyelonephritis.[3, 6]

A urine culture should be used to screen for asymptomatic bacteriuria at 12 to 16 weeks gestation.[3, 7] While some guidelines recommend a second urine culture to confirm bacteriuria prior to treatment,[7] in clinical practice it is common for only one culture to be done.[2]

It is recommended that all pregnant women who have confirmed asymptomatic bacteriuria are treated with antibiotics. The choice of antibiotic can be guided by the known sensitivities, in the following order of preference:[1, 8]

- Amoxicillin (if susceptible): 250 mg three times a day
- Nitrofurantoin: 50 mg four times a day (avoid at 36+ weeks)
- Trimethoprim: 300 mg once a day (avoid in the first trimester)
- Cephalexin: 500 mg twice a day (least preferred option)

All antibiotics should be given for seven days to ensure cure. A recent study found that a one day course of nitrofurantoin is less effective than a seven day course for treating asymptomatic bacteriuria in pregnant women.[9] A repeat culture one to two weeks after completing therapy is required to ensure eradication of bacteriuria. It is then recommended that urine cultures are repeated regularly until delivery.[1, 5] Women who do not have bacteriuria in the first screen (i.e. at 12 to 16 weeks gestation) do not need to have repeat urine cultures.[7]

Group B streptococcus: Even when treated, group B streptococcus bacteriuria is associated with heavy vaginal colonisation and therefore an increased risk of neonatal group B streptococcus disease.[5, 10] Pregnant women found to have group B streptococcus infection in the urine (>10^5 colony-forming units per mL of urine) should be treated at the time of diagnosis, with amoxicillin or cephalexin. Prophylaxis (usually with penicillin G) is given during delivery.

Recurrent infection

Women with recurrent UTIs during pregnancy may require antibiotic prophylaxis. If the UTIs are thought to be related to sexual intercourse, a postcoital (or bedtime) dose of nitrofurantoin 50 mg may be appropriate. Cephalexin 250 mg can also be used.[2]

Pyelonephritis in pregnancy

A diagnosis of acute pyelonephritis should be considered if a patient presents with systemic symptoms such as fever (> 38 °C), flank pain and nausea or vomiting. Symptoms of lower UTI such as frequency and dysuria may or may not be present.[2, 4] Pyelonephritis in pregnancy can have serious consequences such as maternal sepsis, pre-term labour and premature delivery and requires prompt and aggressive treatment.[4] Hospital admission and intravenous antibiotics are usually required. Intravenous antibiotics are usually continued until the patient has been afebrile for 48 hours. Oral antibiotics are then used for 10–14 days.[3]

Safety of antibiotic choices for UTIs

Nitrofurantoin

Nitrofurantoin been used extensively and is considered safe to use during pregnancy,[11] but not during delivery or when nearing term (i.e > 36 weeks). This is because of the possibility of haemolytic anaemia in the newborn, due to immature erythrocyte enzyme systems (glutathione instability).[12]

Nitrofurantoin has been shown to effectively treat asymptomatic bacteriuria, with one study finding a cure rate of 86% achieved with a seven day course.[6, 9] Nitrofurantoin attains therapeutic concentrations in the urine and is suitable for treating asymptomatic bacteriuria and acute cystitis, however, it is not appropriate for treating pyelonephritis because it does not achieve adequate tissue penetration.[13]

Trimethoprim

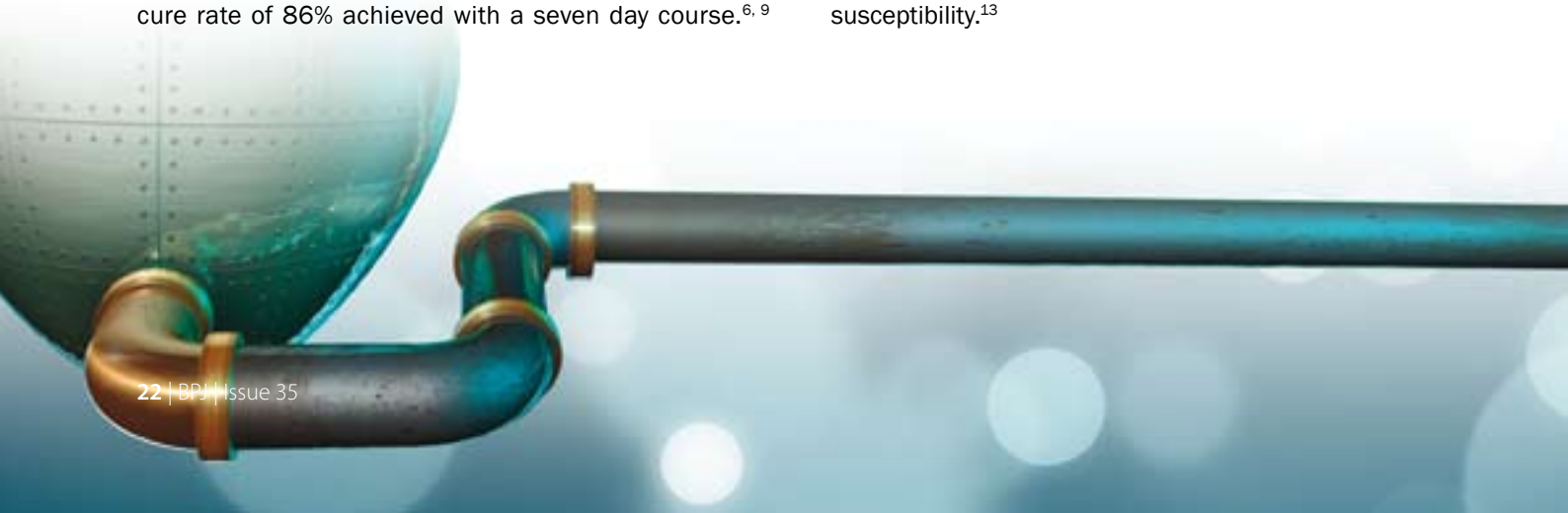
Although trimethoprim is commonly used to treat symptomatic UTIs, good evidence to support its use in pregnancy is lacking.[1] However, it is not thought to be teratogenic.[2] It is recommended that trimethoprim is avoided if possible in the first trimester because it is a folic acid antagonist and theoretically may increase the risk of neural tube defects.[13]

Cephalexin

Cephalosporins are considered safe to use in pregnancy.[11] However, the use of broad spectrum antibiotics (such as cephalosporins) should be avoided when a narrow spectrum antibiotic would be more appropriate.[8] There are concerns that broad spectrum antibiotics increase the risk of *Clostridium difficile*, methicillin-resistant *Staphylococcus aureus* (MRSA) and resistant UTIs. *C. difficile* infection can be life-threatening in pregnant women, and there are case-reports of both maternal deaths and stillborn infants.[1]

Amoxicillin

All penicillins are considered safe to use during pregnancy, however, there is evidence that resistance to amoxicillin is higher than resistance to trimethoprim.[1] For this reason, amoxiciilin is not suitable as an empiric therapy for acute cystitis but can be used if urine culture shows susceptibility.[13]



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