

Asymptomatic bacteriuria during pregnancy *Rapid answers using the Cochrane Library*

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During a busy practice day, we are frequently asked by patients to provide evidence to justify our diagnostic and treatment decisions. In the case below, we demonstrate how the Cochrane Library can sometimes provide the necessary evidence quickly and painlessly.

Case

You are seeing a 32-year-old woman who is 3 months pregnant for her second prenatal visit. During the first prenatal visit, no abnormalities were detected, but your partner ordered a screening urine culture. This is not standard procedure in your practice; however, in reviewing the patient's chart, you note that the culture is positive for *Escherichia coli* (>100 000 colonies/mL). You mention this to the patient and also confirm that she has no urinary symptoms.

You remember that she should probably be treated with an antibiotic, but when you suggest this, she says she does not want to expose her fetus to any drugs unless it is absolutely necessary. In fact, she asks you, "Why do I need to take an antibiotic, and what is the potential harm?" She also asks if cranberry juice would suffice. To buy time, you suggest she repeat the urine culture and come back in 1 week, at which time you promise to have the information.

Six days pass and you still have not had time to look anything up. You have a 15-minute break and remember that, in a previous *Therapeutics Letter*, the Cochrane Library (www.cochrane.org) was recommended as a reputable source of the best available evidence.¹

Cochrane Library

The most up-to-date information is available from the latest Cochrane Library CD-ROM. A less complete version is also available through OVID (University of British Columbia Library). When you search for bacteriuria on the CD-ROM, you get 14 hits in the Cochrane Database of Systematic

Reviews: nine complete reviews and five protocols (reviews in progress). When you double-click on the reviews, you find five titles possibly relevant to this case: "Antibiotics for asymptomatic bacteriuria in pregnancy,"² "Duration of treatment for asymptomatic bacteriuria in pregnancy,"³ "Treatments for symptomatic urinary tract infections during pregnancy,"⁴ "Cranberries for treating urinary tract infections,"⁵ and "Cranberries for preventing urinary tract infections."⁶

Double-clicking on the first relevant review² brings you to the abstract and full review. Updated on December 28, 2000, this review includes 14 randomized placebo-controlled trials. The review concludes that antibiotic treatment is effective in clearing bacteriuria, reducing incidence of pyelonephritis, and reducing incidence of preterm delivery or low birth weight infants. The reviewer advises caution in interpreting the last outcome.

Quantitative evidence

Knowing that your patient will likely want some quantitative estimate of benefit, you need to look at the meta-analysis (quantitative summary of evidence). This can be done most quickly by clicking on "Find," typing in "Metaview," and clicking on "Find next." Double-clicking on the hypertext "Metaview, Tables and Figures" takes you to the meta-analysis figures. Double-clicking on "Development of pyelonephritis" reveals that 13 trials included this outcome and that nine of them showed a significant reduction in pyelonephritis with antibiotics.

The odds ratio (OR) is the summary statistic shown and is most useful when event rates are low. The OR closely approximates the relative risk (RR), which is the better summary statistic in this case.⁷ An RR of 0.25 (95% confidence interval [CI] 0.19 to 0.33) is found by



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clicking on "Statistic" and choosing "Relative risk." This means that the incidence of pyelonephritis is reduced by 75% (RR reduction) with antibiotic treatment. The CI is narrow, demonstrating that the RR estimate is precise.

Clicking again on "Statistic" and on "Risk difference" gives a summary statistic of -0.146. Multiplying this number by 100 gives you an absolute risk reduction (ARR) of 14.6%. From this, you can calculate the number needed to treat by dividing 100 by the ARR to get 7. This means that seven women with asymptomatic bacteriuria during pregnancy need to be treated with an antibiotic to prevent one case of pyelonephritis (Table 1).

Table 1. Effect of antibiotics on incidence of pyelonephritis²

PYELONEPHRITIS	INCIDENCE
Antibiotic (%)	5
Untreated (%)	19
Relative risk	0.25
Relative risk reduction (%)	75
Absolute risk reduction (%)	14.6
Number needed to treat	7

The rest of the meta-analysis shows that a short course of antibiotic therapy (3 to 7 days) is as effective as continuous antibiotics until the end of pregnancy. The review highlights the fact that none of the included studies documents the adverse effects of the antibiotics. A reassuring fact is that one potential adverse consequence, low birth weight or prematurity, was less frequent in the antibiotic-treated group.

You are now running short of time, so you quickly double-click on the other four reviews. You learn from the abstract of "Duration of treatment for asymptomatic bacteriuria in pregnancy"³ that there is insufficient evidence to conclude whether single-dose antibiotic therapy is as good as 4 to 7 days of therapy. From the "Treatments for symptomatic urinary tract infections during pregnancy" abstract,⁴ you learn there are insufficient data to recommend any one specific antibiotic regimen. The "Cranberries for treating urinary tract infections" abstract⁵ indicates that no randomized controlled trials met their inclusion criteria (scanning the review's text, you note that asymptomatic bacteriuria was included). The "Cranberries for preventing urinary

tract infections" abstract⁶ states that "The small number of poor quality trials gives no reliable evidence of the effectiveness of cranberry juice and other cranberry products."

Back to the case

On chart review, you see that your patient's repeat urine culture result is positive for *E coli* with sensitivity to amoxicillin and sulfonamides. You check the Motherisk website (www.motherisk.org), a source of evidence-based information on the potential risks of therapeutic drugs during pregnancy, and find it confirms that penicillins are considered to have a wide margin of safety during pregnancy. You now feel prepared to see your patient the next day.

You tell her that you would not recommend taking cranberry juice, as there is no evidence for its effectiveness. You tell her there is good evidence that a short course of antibiotics reduces the incidence of kidney infection during pregnancy and that for every seven women like her who take a course of antibiotics one case of kidney infection is prevented. After checking for a history of allergy to penicillins, you recommend a course of amoxicillin (500 mg three times daily for 7 days). You tell her that this is based on your confirmation of the safety of penicillins from the Motherisk website. Your patient can then choose whether to take the antibiotic.

Asymptomatic bacteriuria in perspective

The evidence in this case provides an answer for a woman with a positive culture but does not answer the question of whether all pregnant women should be screened. About 6% of pregnant women screened have asymptomatic bacteriuria.⁸ Given a 14.6% ARR with an antibiotic,² 114 women ($1/[0.06 \cdot 0.146]$) would have to be screened to prevent one case of pyelonephritis.

Conclusions

- Reliable sources of the best available evidence are an aid to practice.
- The Cochrane Library is a recognizably incomplete but expanding source of best available evidence.
- Familiarity with the Cochrane Database of Systematic Reviews is necessary to be able to extract information effectively and efficiently. ♣

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