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Recurrent Cystitis in Nonpregnant Women

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Cystitis is a bacterial infection of the lower urinary tract that causes pain when passing urine and that causes frequency, urgency, hematuria, and suprapubic pain not associated with passing urine.

- Recurrent cystitis is usually defined as three episodes of urinary tract infection (UTI) in the previous 12 months, or two episodes in the previous six months.

- It is common in young, healthy women. One study found that 27 percent of women developed a second infection within six months of the first, and 2.7 percent had a second recurrence during this period.

Continuous antibiotic prophylaxis lasting six to 12 months reduces the rate of recurrence, although there is no consensus about when to start the treatment or about how long it should last.

- Trimethoprim, trimethoprim/sulfamethoxazole (co-trimoxazole), nitrofurantoin, cefaclor, or quinolones seem equally effective at reducing recurrence rates.

Postcoital antibiotics (taken within two hours of intercourse) reduce the rate of clinical recurrence of cystitis as effectively as continuous treatment.

We do not know whether single-dose, self-administered trimethoprim/sulfamethoxazole or continuous prophylaxis with methenamine hippurate are effective in preventing recurrence of cystitis, because the studies were too small to show clinically relevant differences.

Cranberry products (juice or capsules) seem to significantly reduce the recurrence of symptomatic cystitis.

- There is no clear evidence about the amount and concentration of cranberry juice that needs to be consumed, or about the length of time needed for the treatment to be most effective.

There is no evidence examining whether passing urine after intercourse is effective at preventing UTI.

We found insufficient evidence on the effects of topical estrogen in postmenopausal women in the prevention of recurrent cystitis.

Definition

In most cases, cystitis is a bacterial infection of the lower urinary tract that causes pain when passing urine and causes frequency,

Clinical Questions

Which interventions prevent further recurrence of cystitis in women experiencing at least two infections per year?

Beneficial	Continuous antibiotic prophylaxis (trimethoprim, trimethoprim/sulfamethoxazole, nitrofurantoin, cefaclor, or a quinolone) Postcoital antibiotic prophylaxis (trimethoprim/sulfamethoxazole, nitrofurantoin, or a quinolone)
Likely to be beneficial	Cranberry products (juice, capsules)
Unknown effectiveness	Continuous prophylaxis with methenamine hippurate Estrogen (topical) in postmenopausal women Passing urine after intercourse Single-dose, self-administered trimethoprim/sulfamethoxazole

urgency, hematuria, and suprapubic pain not associated with passing urine. White blood cells and bacteria are almost always present in the urine. A recurrent UTI is a symptomatic infection that follows clinical resolution of an earlier infection generally, but not necessarily, after treatment. Recurrent cystitis is usually defined in the literature as three episodes of UTI in the previous 12 months or two episodes in the previous six months. Recurrent UTIs cause serious discomfort to women and have a high impact on ambulatory health care costs through outpatient visits, diagnostic tests, and prescriptions.

Incidence

Recurrent cystitis is common among young, healthy women, even though they generally have anatomically and physiologically normal urinary tracts. One study found that nearly one half of women whose uncomplicated UTI resolved spontaneously developed a recurrent UTI within one year. In a study of college women with their first UTI, 27 percent experienced at least one culture-confirmed recurrence within six months of the initial infection, and 2.7 percent had a second recurrence during this period. In a Finnish study of women 17 to 82 years of age who had *Escherichia coli* cystitis, 44 percent had a recurrence within one year (53 percent in women older than 55 years, 36 percent in younger women). No large population-based studies have been done to determine proportionately how many women with UTI develop a pattern of high-frequency recurrence.

Occasionally, recurrences are due to a persistent focus of infection, but most are thought to represent reinfection. A recurrence is defined clinically as a relapse if it is caused by the same species that caused the original UTI, and if it occurs within two weeks after treatment. It is considered reinfection if it occurs more than two weeks after treatment of the original infection. Most women are able to diagnose their own episodes of recurrent cystitis from symptoms (positive predictive value in one randomized controlled trial was 92 percent).

Etiology

Cystitis is caused by uropathogenic bacteria in the fecal flora that colonize the vaginal and periurethral openings and ascend the urethra into the bladder. Sexual intercourse, diaphragm-spermicide use, and a history of recurrent UTI have been shown to be strong, independent risk factors for cystitis. Use of spermicide-coated condoms may also increase the risk of UTI. Antimicrobial use has been shown to adversely affect the vaginal flora in animals and humans, and recent antibiotic use is strongly associated with risk of cystitis.

However, risk factors specific to women with recurrent cystitis have received little study. In a large, case-control study of women with and without a history of recurrent UTI (comprising 229 cases and 253 controls), frequency of sexual intercourse was the strongest risk factor for recurrence in a multivariate analysis. Other risk factors included spermicide use in the past year, new sex partner during the past year, having a first UTI at or before 15 years of age, and having a mother with a history of UTI. Urine-voiding disorders, such as those associated with prolapse, multiple sclerosis, bladder cancer, or bladder stones, are also associated with increased risk. An association has been found with pre- and post-coital voiding, frequency of urination, delayed voiding habits, douching, and body mass index. A possible association between smoking (which is strongly associated with bladder cancer) and recurrent cystitis has not been assessed. These behavior patterns have never been evaluated in prospective, randomized trials.

Data suggest that pelvic anatomical differences may have a role in predisposing some young women to recurrent UTI, especially those without other risk factors. In postmenopausal women, reduced estrogen levels seem to contribute to recurrent cystitis in healthy women. The vagina, bladder, and urethra respond to estrogen, and when the hormonal level in the body is reduced, the tissues of these organs become thinner, weaker, and dry. The changes in the tissues of the bladder and urethra, and the associated loss of protection against infection-causing germs, may increase the risk of UTI in postmenopausal women.

Cystitis is also more common during pregnancy because of changes in the urinary tract. As the uterus grows, its increased weight can block the drainage of urine from the bladder, causing an infection. Women are at an increased risk of recurrent cystitis from six to 24 weeks of pregnancy.

Prognosis

We found little evidence on the long-term effects of untreated cystitis. One study found that progression to pyelonephritis was uncommon, and that most cases of cystitis regressed spontaneously, although symptoms sometimes persisted for several months. However, bacteriuria in pregnant women carries a much greater risk of progressing to pyelonephritis than in nonpregnant women (28 versus 1 percent), and is associated with serious risks.

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