Cochrane for Clinicians

Putting Evidence Into Practice

Guiding Prescription of Antibiotics in People With Acute Respiratory Infections: Biomarkers as Point-of-Care Tests

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Clinical Question

Are inflammatory biomarkers beneficial or harmful when used to guide antibiotic treatment for acute respiratory infections?

Evidence-Based Answer

C-reactive protein (CRP) point-of-care tests can reduce unnecessary antibiotic prescribing without delaying clinical recovery when used to inform treatment decisions for acute respiratory infections in primary care (number needed to test = 9; 95% CI, 6 to 14). (Strength of Recommendation [SOR]: A, consistent, good-quality patient-oriented evidence.) It remains unclear whether procalcitonin point-of-care tests affect antibiotic use or patient recovery.[1]

Practice Pointers

A 2016 study using the 2010-2011 National Ambulatory Medical Care Survey and National Hospital Ambulatory Medical Care Survey found that nearly one in three antibiotic prescriptions in U.S. ambulatory care settings was inappropriate.[2] Optimizing antibiotic prescribing practices in outpatient settings reduces the risk of antibiotic resistance, potential adverse drug effects, and harmful bacterial overgrowth in patients and aligns with national and international public health goals.[3,4]

The Cochrane review included 13 randomized controlled trials (RCTs) and cluster RCTs in a meta-analysis of 8,200 adults and 2,335 children.[1] Studies were conducted in primary health care settings in Europe and Asia. One study included participants from nursing homes. In 12 studies, moderate-certainty evidence showed that using CRP point-of-care tests decreased the number of participants prescribed an antibiotic (number needed to test = 9; 95% CI, 6 to 14), although considerable heterogeneity existed. High-certainty evidence showed that using CRP point-of-care tests also reduced the number of participants prescribed an antibiotic within 28 days of follow-up (number needed to test = 8; 95% CI, 6 to 11).

Moderate-certainty evidence showed that there was no difference in clinical recovery rates at seven or 28 days among those who did or did not undergo a CRP test. The use of these tests did not change mortality or hospital admission rates, although low event numbers regarding these outcomes limited the evidence. A conclusion about what effect procalcitonin point-of-care tests might have on antibiotic prescribing and patient recovery could not be made due to the limited sample size of 317 adults from one trial.

CRP point-of-care tests use drops of blood from a finger prick and return a result in about three minutes. There is no standardized CRP cutoff to guide antibiotic prescriptions. Considerable differences in CRP cutoffs and application to antibiotic prescriptions existed across studies in the Cochrane review. However, a sensitivity analysis of nine included studies that used a cutoff of 2 mg per dL (20 mg per L) was consistent with the overall conclusion that CRP tests can reduce antibiotic prescriptions. In the United Kingdom, the National Institute for Health and Care Excellence (NICE) provides CRP cutoffs to guide antibiotic prescribing in conjunction with clinical assessment for possible pneumonia in adults presenting to primary care. NICE recommends avoiding antibiotic prescription if CRP is less than 2 mg per dL, delaying prescription if CRP is between 2 and 10 mg per dL (100 mg per L), and offering antibiotics if CRP is greater than 10 mg per dL.[5] Clinicians should acknowledge the lack of test validation in children and older adults with comorbidities and the possible opportunity cost of suboptimal time use, patient dissatisfaction, and false-positive or false-negative results when integrating CRP tests into primary care practice. Although the use of CRP tests might increase health care costs, European studies suggest it is likely a cost-effective intervention in reducing antibiotic prescriptions.[1] Future research should be aimed at evaluating procalcitonin and new biomarkers.

Editor's Note: The numbers needed to test and related CIs reported in this Cochrane for Clinicians were calculated by the authors based on raw data provided in the original Cochrane review.

The practice recommendations in this activity are available at https://www.cochrane.org/CD010130.

These are summaries of reviews from the Cochrane Library.

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A collection of Cochrane for Clinicians published in *AFP* is available at https://www.aafp.org/afp/cochrane.

CME This clinical content conforms to AAFP criteria for CME. See CME Quiz on page 20.

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Urinary Incontinence in Women: Conservative Interventions for Treatment

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Clinical Question

Are conservative interventions effective in treating women with urinary incontinence, specifically stress or urge urinary incontinence?

Evidence-Based Answer

Pelvic floor muscle training (PFMT) is more effective than control at achieving cure and improving symptoms and quality-of-life measures in women with all types of urinary incontinence. (Strength of Recommendation [SOR]: A, consistent, good-quality patient-oriented evidence.) PFMT for all types of urinary incontinence is more effective if it is more intense, done more frequently, and performed with individual supervision. (SOR: B, limited-quality patient-oriented evidence.) Vaginal cones are more effective than control at achieving cure or improving symptoms in patients with stress urinary incontinence. Electrical stimulation is more beneficial than control at achieving cure or improving symptoms in patients with stress urinary incontinence. Electrical stimulation is also more effective than control at improving symptoms in women with urge urinary incontinence. Women who are overweight or obese may benefit from weight loss, which results in more cure and improvement of symptoms in any type of urinary incontinence.[1] (SOR: B, limited-quality patient-oriented evidence.)

Practice Pointers

Urinary incontinence is the involuntary loss of urine and can be caused by numerous conditions.[2] It can result from damage to the neural regulation of the bladder and pelvic floor muscles or from direct mechanical trauma to the pelvic floor.[3] Risk factors for urinary incontinence include vaginal delivery, increasing age and parity, obesity, and menopause.[4] It is estimated that at least 25% of all adult women have urinary incontinence, and prevalence increases with age.[5] Conservative interventions are typically recommended as first-line treatment for urinary incontinence.[6] The Cochrane review is a network review designed to collate the conclusions of multiple systematic reviews focused on urinary incontinence; the objective of the review was to assess the effectiveness of conservative interventions for treating urinary incontinence in women.[1]

The review included a total of 29 Cochrane reviews involving 112 unique trials and 8,975 women.[1] Of these reviews, seven focused on physical therapy; five on education, behavioral modification, and lifestyle advice; one on mechanical devices; one on acupuncture; and one on yoga. Fourteen reviews focused on nonconservative treatments compared with conservative interventions. The participants were women 18 years or older with a diagnosis of stress, urge, or mixed urinary incontinence, regardless of underlying cause or comorbidities. Primary outcome measures included symptomatic cure or improvement of urinary incontinence and condition-specific quality of life.

In patients with stress urinary incontinence, there was moderate- to high-certainty evidence that PFMT, PFMT with biofeedback, and weighted vaginal cones (small weights placed in the vagina that provide a form of biofeedback to help strengthen and synchronize pelvic floor muscle contractions) were more effective than control for curing or improving urinary incontinence. PFMT and intravaginal assistive devices (e.g., vaginal cones, biofeedback, electrical stimulation) also improved quality of life compared with control.

There was moderate- to high-certainty evidence that PFMT plus clinician verbal feedback, PFMT plus biofeedback, electrical stimulation, and bladder training were more beneficial than control for curing or improving symptoms in patients with urge urinary incontinence. There was high- or moderate-certainty evidence that PFMT resulted in a higher quality of life than electrical stimulation; electrical stimulation plus PFMT resulted in better cure and improvement of symptoms and quality-of-life measures than PFMT alone.

For patients with all types of urinary incontinence, including participants with stress, urge, and mixed incontinence and those with an unclear type, there was moderate- to high-certainty evidence that PFMT cured more individuals, resulted in greater symptomatic improvement (defined variously in different studies), and improved quality

of life compared with control; the same can be said for electrical stimulation, weight loss, and the use of weighted vaginal cones. Combination therapy was generally found to be superior to monotherapy for the conservative interventions studied. For example, there was moderate- to high-certainty evidence that better rates of cure or improvement in symptoms could be achieved with the combination of PFMT and bladder training compared with bladder training alone. Intensity of PFMT—including attention to the number of voluntary pelvic floor muscle contractions performed per set, the duration of hold, the duration of rest, number of sets per day, body position, and the types of contractions—was important. More intensive and supervised PFMT was found to be more effective than less intensive and less supervised PFMT for all types of urinary incontinence.

Although one-half of the conclusions in the network analysis were drawn on the basis of moderate- or high-certainty evidence, 81% of the conclusions resulted from Cochrane reviews that included only one trial.[1] Another potential limitation is that the network analysis included only Cochrane reviews and the authors acknowledge that the quality of the trials within the reviews varied substantially. Despite these limitations, there is certainty that PFMT is effective for most types of urinary incontinence in women, at least in the short term. Further high-quality randomized controlled trials are needed to determine the appropriate intensity and dosing of PFMT and the benefits of electrical stimulation, manual techniques, and the effectiveness of lifestyle interventions and psychological therapies for the relief of urinary incontinence symptoms. Clinicians should discuss conservative therapies with patients who have any type of urinary incontinence.[6]

Patient Perspective

Effectiveness of various treatments is important to know, but I wonder how instructive a Cochrane review can really be as a guide for a disorder as personal as incontinence. Although the treatments cited here are undoubtedly conservative compared with other interventions, to the average person some of them must sound like a species of torture; I suspect that the instinctive response of many to the idea of vaginal cones and electrical stimulation would be "Eww!"

What is missing from these cold statistics is the equally vital consideration of patient preference. It is important to note that one of the most effective interventions for urinary incontinence is PFMT, the most conservative of the options studied. Most patients, presumably, would not object to a prescription for PFMT, although there is likely to be a low rate of adherence. For some women, the difficulty in achieving acceptable results may be an incentive to try more permanent, but riskier, procedures; others may forgo medical treatment altogether. Ultimately, these decisions will depend, in no small part, on how problematic patients feel their bladder leakage is in their daily lives.

Editor's Note: The patient perspective is the opinion of the patient perspective author and, although peer reviewed, does not represent evidence-based conclusions.

The practice recommendations in this activity are available at https://www.cochrane.org/CD012337.

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