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COMPARATIVE EFFECTIVENESS OF CONSERVATIVE TREATMENTS FOR WOMEN WITH URINARY INCONTINENCE

Hypothesis / aims of study
Prior systematic reviews of conservative treatments for urinary incontinence (UI) in women have not focused on comparative effectiveness of treatments or included continence as a key outcome variable. Our comprehensive synthesis of the evidence relates to: 1) the effectiveness of conservative treatments in women with respect to UI, UI severity and frequency, and quality of life compared to no active treatment; 2) the comparative effectiveness of these treatments; and 3) the patient characteristics that are most likely to modify treatment outcomes.

Study design, materials and methods
A systematic review of 97 randomized and 44 nonrandomized studies on conservative (nonpharmacological) treatments for UI in women published from 1990 to December 30, 2010 in English was conducted. Data extraction was performed independently by three researchers using a standardized form along with an assessment of the study quality and strength of the evidence. Measures of treatment success included: continence, improvement in UI frequency or severity, and improvement in condition-specific quality of life. We calculated relative risk, absolute risk differences, number needed to treat (NNT), and the number of attributable to active treatment events per 1,000 treated. Meta-analysis was conducted using random effects model to incorporate differences across randomized trials in patient populations, baseline rates of the outcomes, and other factors. We explored heterogeneity with meta-regression, subgroup, and sensitivity analysis by clinical diversity, treatment duration, and quality criteria of individual studies, as well as disclosed conflict of interest by the authors of the studies.

Results
Conservative treatments were better than no active treatment in achieving continence and improving UI and quality of life. Magnitude of benefit was large with low risk of adverse effects. Table 1 summarizes comparative effectiveness of treatments when evidence was sufficient to derive conclusions. Pelvic floor muscle training (PFMT) including different exercise regimens had the highest level of evidence for continence, UI improvement, and quality of life. Bladder training improved UI although the evidence was low. Continence was achieved in one woman when three were treated with PFMT (NNT=3, 95% CI 2, 5); six with PFMT combined with bladder training (NNT=6, 95% CI 4, 16); and six with electrical stimulation (NNT=6, 95% CI 4, 16). Women with predominant urgency UI can achieve continence with PFMT with bladder training (NNT= 6 95%CI 4; 16). Four women with urgency UI need to be treated with percutaneous tibial nerve stimulation for one woman to achieve improvement in UI (NNT=4, 95% CI 2, 25). Weight loss did not improve continence rates compared to usual care, but improved UI in obese women (NNT=4, 95% CI 2, 18). There were inconsistent benefits from continence services implemented by specialized health care providers on continence rates for any UI, type of UI, and improvement of UI when compared to usual care, although promising results were noted on quality of life improvements. There was insufficient evidence to derive conclusions related to the benefits of vaginal cones, acupuncture, and medical devices. Improvement in UI and quality of life were examined using different definitions that hampered synthesis of evidence.
Continence rates attributable to active treatments (i.e., the difference between treated and controls) per 1000 women treated were: 229 with PFMT, 162 with electrical stimulation, and 162 with PFMT combined with bladder training.
Indirect comparison of crude continence rates indicated comparable effectiveness of conservative treatments on continence: 38% of women became continent with PFMT, 21% with electrical stimulation and 21% with PFMT combined with bladder training. Individual RCTs demonstrated that continence rates were 23% with vaginal cones, 29% with continence services, and 7% with weight loss.

Table 1: Comparative Effectiveness of Conservative Treatments in Women

Conclusion	**Level of Evidence**
Stress UI	
PFMT increased continence rates and improved UI when compared to no active treatment	High
PFMT improved several domains of quality of life	Low
PFMT with biofeedback when compared to usual care	
Increased continence rates	Low
Improved UI	High
Electrical stimulation when compared to sham stimulation	
Increased continence rate and improved UI	High
Improved quality of life	Moderate
Magnetic stimulation when compared to sham stimulation	
Improved UI but did not increase continence rates	Moderate
Improved quality of life	Low
Continence did not differ:	
PFMT and biofeedback when compared to PFMT alone	High
Supervised PFMT when compared to PFMT	High
PFMT when compared to electrical stimulation	Moderate
Urgency UI	
Bladder training compared to usual care improved UI	Low

PFMT combined with bladder training compared to usual care Increased continence rates and improved UI Reduced UI severity	 High Low
Percutaneous tibial nerve stimulation improved urgency UI	Moderate
Continence did not differ: PFMT and bladder training when compared to bladder training	 High
Mixed UI	
Continence services implemented by specialized health care providers increased continence rates and improved UI compared to usual care	Low
Magnetic stimulation when compared to sham stimulation Improved UI but did not increase continence rates Improved quality of life	 Moderate Low
Weight loss and exercises improved UI in obese women	Moderate

Evidence was insufficient to conclude prediction of treatment effects by age, race, baseline type and severity of UI, and comorbidities.

Interpretation of results

Pelvic floor muscle training alone or combined with bladder training, and electrical stimulation should be first line treatment choices for women with UI in ambulatory care settings. Weight loss can also be beneficial. Percutaneous tibial nerve stimulation may be helpful for women with urgency UI.

Concluding message

Conservative treatments have an important role in the treatment of female urinary incontinence and should be incorporated into ambulatory care practice settings.

Specify source of funding or grant	**Agency for Healthcare Research and Quality**
Is this a clinical trial?	**No**
What were the subjects in the study?	**NONE**