Acupuncture for Urinary Urgency In Women Over 50: What Is the Evidence?

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A recent case report in the New England Journal of Medicine described a 73-year-old woman who developed hallucinations and significant memory impairment after starting an anticholinergic medication commonly used to treat urinary urgency (UU) (Tsao, 2003). In response to these new symptoms, the woman was treated pharmacologically for Alzheimer’s disease with a cholinergic enhancer. Her central nervous system (CNS) symptoms resolved completely when she discontinued the anticholinergic medication, and resumed when she restarted it. The author, a neurologist, raised a caution surrounding use of anticholinergic medications as treatment for urinary symptoms in the elderly, and suggested that baseline and followup memory screening should accompany use (Tsao, 2003). UU is defined as a sudden and compelling desire to pass urine that is difficult to defer (Abrams et al., 2002). It tends to increase with aging in both sexes, but is more often associated with urge urinary incontinence (UUI) in women (Stewart et al., 2003). UU and UUI are costly both in terms of lost productivity and impact on quality of life (QOL) (Fantl et al., 1996; Wyman, 1997).

Common treatments for UU are predominantly nonsurgical, and involve a combination of behavioral techniques, pelvic muscle strengthening, and pharmacologic treatment with anticholinergic medications (Fantl et al., 1996; Wyman, 2003). Although package inserts for anticholinergic medications used for UUI suggest that significant CNS reactions are rare, intermittent reports of confusion and memory impairment after their use have appeared in the literature (Perry, Kilford, Lees, Burn, & Perry, 2003; Sunderland et al., 1987; Womack & Heilman, 2003). Prescribers are generally encouraged to avoid anticholinergic medications in the elderly whenever possible (Beers, 1997; Cotter & Stumpf, 2002; Reuben et al., 2004). Despite public interest in the subject, complementary therapies that may help avoid unnecessary pharmacologic therapies are understudied (Flaherty et al., 2001; Griebling, 2004). The purpose of this article is to review current knowledge related to the use of acupuncture to treat UU and related symptoms in women over 50 to assess its potential as an alternative treatment, and to suggest areas for further research.

Background

The International Continence Society suggests that lower uri-
Urinary tract symptoms can be divided into three areas: problems of storing urine, problems of emptying urine, and symptoms that occur after voiding (Abrams et al., 2002). UU is a storage problem, which may or may not be followed by UUI. Other related storage problems include urinary frequency (the complaint of voiding too often) and nocturia (the need to wake at night for bladder emptying). In the absence of other pathology, these symptoms are suggestive of abnormal bladder contractions, and are often referred to as overactive bladder syndrome (OAB) (Abrams et al., 2002). Establishing the prevalence of UU itself is difficult because the feeling of urgency is subjective and the amount of bother felt varies, with some individuals viewing UU as normal (Abrams et al., 2002). The related symptom of UUI has been easier to track. A recent study suggests the prevalence of UUI increases with age and shows equal prevalence overall in men and women (16% vs. 16.9%), whereas UUI is more common in women than in men (Stewart et al., 2003). Moreover, both UU and UUI are associated with poorer QOL and sleep scores, and increased depression (Stewart et al., 2003). What makes UU and UUI in older adults a women’s health issue is the increased longevity of older women; at age 64, there are 92 men per 100 women, and by age 85 this drops to 46 (Smith, 2003). Urinary incontinence (UI) is also a common problem in long-term care facilities, where 39% of new admissions report UI (Ouslander, Palmer, Rovner, & German, 1993); on objective testing, 64% of those individuals with UI had demonstrable abnormal bladder contractions (Ouslander et al., 1988).

Pathophysiology of Urinary Urgency with Aging

The etiology of UU and associated UUI is not entirely clear, but a variety of local and higher CNS mechanisms have been implicated, including smooth muscle hypersensitivity and decreased effectiveness of neuromodulators responsible for smooth muscle relaxation (Robinson, 1998). Neurological input to the bladder includes autonomic, somatic, and sensory and motor pathways. Coordinated relaxation of the detrusor muscle via the sympathetic nervous system allows urine to collect in the bladder without raising pressure in the bladder during filling. Parasympathetic stimulation through the release of acetylcholine results in detrusor contraction to promote bladder emptying. Thus, cholinergic over-activity plays a role in UU (Turner & Brading, 1997).

Myogenic determinants of UU may relate to either skeletal muscle abnormalities such as loss of voluntary control of the pelvic floor muscles, or to smooth muscle changes in cells of the detrusor itself, causing them to fire spontaneously in an uncoordinated fashion (Mills et al., 2000; Turner & Brading, 1997).

Age-associated changes that increase the prevalence of UU include decreased bladder capacity, delay in the signal to void, increased post-void residual, increased nighttime voiding, and atrophic muscle and skin changes (Melillo, 1995). Symptoms of UU may also be related to increased bacteruria associated with increased alkalinity and decreased antibacterial protein content in the urine, decreased autonomic nervous system responsiveness, disregulation of urine volume control, and a general decrease in mobility related to loss of muscle strength and joint disease (Hazzard, Blass, Halter, Ouslander, & Tinetti, 2003).

General Considerations in Care of Older Adults

The focus of care for older adults is on maintaining independence, managing effects of multiple chronic disorders, and, when full independence is not possible, maintaining dignity and comfort (Katz, Grossberg, Potter, & Solomon, 2002). A small loss of function that may be insignificant to a younger person may be devastating to an older person who is already in precarious health. Because the aging process proceeds at different rates in different individuals related to their genetics, environment, and lifestyle, chronological age alone is often not predictive of health status (Hazzard et al., 2003; Katz et al., 2002).

Pharmacodynamics in older adults are affected by changes in absorption, distribution, metabolism and excretion, making medication use more precarious just as co-morbid conditions tend to make polypharmacy more common. This situation puts older adults at risk for a prescribing cascade, where side effects of prescribed medications are mistaken for new illnesses and treated with additional prescriptions (Rochon & Gurwitz, 2003). This risk is illustrated by the opening case.

Although use of anticholinergic medication is discouraged in older adults, even without treatment for UU, many are on multiple, commonly used medications with potent anticholinergic effects, such as sleep aids and sedatives, antipsychotics, antidepressants, decongestants and antihistamines, and treatments for Parkinson’s disease (Reuben et al., 2004).

Treatment Options

For Urinary Urgency

Behavioral modifications, including fluid and dietary changes, scheduled voiding and bladder retraining, pelvic floor muscle strengthening, and voiding diaries to monitor impact of therapy, are safe, effective first-line treatments for symptoms.
related to UU in any age group (Fantl et al., 1996). This combination of behavioral strategies results in improvement of UUI in 75% to 80% of older women (n=197, age 55-92) (Burgio et al., 1998). Additional use of formal biofeedback sessions does not further improve outcomes (Burgio et al., 2002).

In the United States, the availability of Medicare reimbursement for electro stimulation (ES) makes it an affordable treatment option for older women with UUI. ES has been suggested as an adjunct to behavioral therapy in older women with an intact sacral micturition pathway (Fantl et al., 1996). The proposed mechanism of action for ES includes benign stimulation of contraction of the skeletal muscles of the levator ani and urethral and anal sphincters with simultaneous reflexive relaxation of the detrusor (Fantl et al., 1996). Recent reviews of ES research have reached mixed conclusions: average effectiveness rates were reported as 20% dry and 37% improved in one review (Appell, 1998); another reported insufficient quality of evidence to support use (Berghmans et al., 2000).

Anticholinergic medications are the predominant pharmacologic treatment for UU-related symptoms. In a study of older women, objective bladder capacity significantly improved in a group receiving anticholinergic medication versus a group receiving behavioral therapy (69.9 mL vs. 17.3 mL respectively, p<0.001). However, nocturia was more effectively reduced by behavioral therapies than by anticholinergic medication alone (p=0.02), suggesting the need for further study related to the complex effect of interventions, and of subjective and objective outcomes (Burgio, Locher, & Goode, 2000). Clinical trials have suggested a high placebo effect in treatment of UU and UUI. For example, a comparison of tolterodine tartrate extended-release 4 mg vs. placebo over 8 weeks of use found UUI episodes decreased (12.3% vs. 8.0%; p<0.0001), and perceived benefit of treatment significantly increased (76% vs. 55%; p<0.001) (Khullar et al., 2004). A recent systematic review concluded that, in people over age 55, overall reduction in UUI with placebo alone was approximately 40% (Teunissen, de Jonge, van Weel, & Lagro-Janssen, 2004).

Estrogen use has also been evaluated as a treatment of UU or UUI in older women. A Cochrane Review suggested there was sufficient evidence to include estrogen as a treatment of UUI in older women, although optimum dose, route, and duration of use have not been verified (Moeher, Hextall, & Jackson, 2004). In a large clinical trial, the Women’s Health Initiative, oral estrogens had no significant effect on reported UUI symptoms (Hendrix et al., 2005). There is limited literature supporting the use of topical estrogen to treat UU. One non-randomized, non-controlled study suggested that 58% of post-menopausal women with OAB given topical estradiol applied as 1 g of cream three times per week to the periurethral area reported decreased symptoms of UU over 1 month of use (Chaikin, Haney, Karram, & Staskin, 2004).

**Acupuncture as a Potential Treatment for UU and UUI**

Western research related to the efficacy of acupuncture in treatment of symptoms such as urinary complaints, depression, and conditions related to chronic pain has been reported starting in the 1970s (Dale, 1982). Physiologic findings have provided a plausible basis for the effectiveness of acupuncture in treating pelvic problems. For example, acupuncture activates CNS endorphin systems, decreasing pain sensation (Han & Terenius, 1982); opiate-agonists increase detrusor pressure, decrease bladder capacity, and lower urethral closure pressure during urodynamics (Murray & Feneley, 1982); and biochemically mediated micturition center effects are reduced after electroacupuncture treatment in rats whose bladders are artificially irritated (Chang et al., 1996). Acupuncture appears to have a feasible role in mediating pelvic discomfort and bladder hypersensation.

Recent small, uncontrolled studies have suggested a clinical role for acupuncture in a variety of pelvic floor dysfunctions in men and in younger women (Chen & Nickel, 2003; Danielsson, Sjoberg, & Ostman, 2001; Geirsson, Wang, Lindstrom, & Fall, 1993; Honjo, Naya, Ukimura, & Kojima, 2000; Lu & Fitzpatrick, 2001). Public interest in complementary therapies has risen in recent decades (Flaherty et al., 2001). Sixty-four percent of surveyed older adults reported using complementary therapies, with acupuncture one of the chosen modalities (Flaherty & Takahashi, 2004). Although research has supported the efficacy of more commonly used treatments for UU in some women, there is a need to evaluate the range of complementary treatment options in this climate of growing public interest (National Center for Complementary and Alternative Medicine [NCCAM], 2005). The evidence base evaluating acupuncture as a treatment for women over 50 with UU and/or UUI follows.

**Method**

This integrated literature review began initially with the databases Medline (from 1966), CINAHL (from 1982), PubMed, and the Cochrane Systematic Review, which were searched through August 31, 2005 using combinations of the key words acupuncture, urge incontinence,
urinary incontinence, urgency, detrusor instability and overactivity, frequency, and nocturia. Reference lists of retrieved articles were reviewed, as was the online journal Medical Acupuncture. Because the initial focus of the review was acupuncture as a treatment option of older women, the search was then restricted to studies that included adult women as participants. Studies that included any women age 50 or older are included in this review because of the dearth of literature focused specifically on older women. Only published full-text articles in English are included in this review.

Results

Only five full-text articles that presented results of acupuncture treatment of adult women with UU or related symptoms were identified. Findings are summarized in Table 1. These studies all included women over 50, and one specifically examined women over age 65 who had previously failed conventional treatments (Bergstrom, Carlsson, Lindholm, & Widgren, 2000). Three studies compared treatment groups. Two of these studied an alternate or sham acupuncture point as a control (Chang, 1988; Emmons & Otto, 2005). One study randomized women to use of an anticholinergic medication (oxybutynin) with weekly followup versus weekly acupuncture treatments (Kelleher, Filshie, Burton, Khullar, & Cardozo, 1994). Statistical comparison between groups was impeded in these studies by low numbers of participants. None of the studies achieved sufficient power to rule out placebo effect as the modality of efficacy.

Protocols varied related to number of needles used, rotation versus non-rotation of needles, and number of visits. All five studies included stimulation of acupuncture needle to point Spleen 6 (5 cm above the tip of the medial malleolus on the posterior border of the tibia) in the treatment arm as originally suggested by Chang (1988). Immediate improvement was demonstrated in one study (Chang, 1988), and significant differences were seen after four to six treatments in three of the studies (Bergstrom et al., 2000; Emmons & Otto, 2005; Kelleher et al., 1994). No cumulative effect was noted and intermittent treatments were suggested as necessary to maintain symptom relief over time (Chang, Wu, & Huang, 1993).

Both subjective and objective improvements were reported. All studies reported significant improvement of subjective measures such as QOL and symptom distress. Concomitant bowel problems were also improved in one study (Bergstrom et al., 2000). Objective outcome measures varied, and included voiding diaries (Bergstrom et al., 2000; Emmons & Otto, 2005; Kelleher et al., 1994), pad weights (Bergstrom et al., 2000), and urodynamic testing (Chang, 1988; Chang et al., 1993, Emmons & Otto, 2005; Kelleher et al., 1994). Voiding diaries indicated significant improvement in nocturia, daytime voiding intervals, and voided volumes (Bergstrom et al., 2000; Emmons & Otto, 2005; Kelleher et al., 1994). Significant changes on urodynamic evaluation included increased bladder capacity (Chang, 1988; Emmons & Otto, 2005; Kelleher et al., 1994); however, this did not continue in long-term followup (Chang et al., 1993).

Safety and acceptability of acupuncture was assessed in each study. No serious adverse effects were reported from acupuncture treatments. No participants dropped out due to pain or discomfort. In the single long-term followup study (5 years), 4 of 26 women dropped out due to lack of efficacy (Chang et al., 1993). In the study that compared oxybutynin with acupuncture, 2 of 20 women reported inconsistent, slight discomfort with needle insertion, and three felt occasional light-headedness, while all of the subjects in the oxybutynin group (n=19) reported dry mouth, half reported headache, dizziness, gastrointestinal upset, and visual impairment, and three dropped out due to side effects (Kelleher et al., 1994).

Discussion

Despite the increased interest in complementary therapies in the United States, there is still a dearth of supporting research (Flaherty & Takahashi, 2004; NCCAM, 2005). This literature review suggests the scarcity of full-text, online data. However, it also suggests that women over 50 who are interested in trying acupuncture as a nonpharmacologic treatment for UU or UI can be reassured that acupuncture is likely to be safe, may improve QOL, and may decrease symptoms. If symptom relief occurs, it can be expected to do so within 4 to 6 weeks of treatment. Generalized efficacy is not well established.

Suggested areas for further research for all UU treatments include optimum treatment regimens, usefulness in special populations, and the efficacy of combinations of treatments (Fantl et al., 1996). The absence of significant long-term change on urodynamic testing in the only trial that assessed this (Chang et al., 1993), suggests that using less-invasive pad weighing may be an appropriate, less-burdensome outcome measure (Bergstrom et al., 2000).

Several issues increase the challenge of studying acupuncture. Although this review suggests that acupuncture was well-tolerated by those willing to par-
Table 1.
Research Reporting the Use of Acupuncture for Urinary Urgency and Related Symptoms in Women over 50

<table>
<thead>
<tr>
<th>Study</th>
<th>N</th>
<th>Population [Mean age in years (range)]</th>
<th>Design/Protocol</th>
<th>Followup</th>
<th>Results</th>
<th>Comments</th>
</tr>
</thead>
<tbody>
<tr>
<td>Bergstrom et al., 2000</td>
<td>15</td>
<td>[76.4 (66-82)] women had failed behavioral and anticholinergic treatments</td>
<td>Pre and posttest pilot study of 12 treatments over 6 weeks.</td>
<td>3 months</td>
<td>12/15 subjectively improved. Nocturia incidents: 1.6 to 1.0 ** QOL*: 41 to 55 **</td>
<td>10 women declined study. Symptoms started to recur 1-month post treatment. No adverse effects.</td>
</tr>
<tr>
<td>Chang, 1988</td>
<td>52</td>
<td>[35 (17-52)]</td>
<td>Controlled trial comparing treatment and sham points. Urodynamic assessment before and after single treatment.</td>
<td>30 minutes</td>
<td>Change in bladder capacity: Treatment: 222 cc to 258 cc * Control: 245 cc to 264 cc NSb Presence of detrusor contraction: Treatment: 8 to 6 * Control: 6 to 5 (NS)b</td>
<td>No adverse events. Followup short term.</td>
</tr>
<tr>
<td>Chang et al., 1993</td>
<td>26</td>
<td>[35 (17-52) years]</td>
<td>Longitudinal follow-up. Pre and post-treatment comparisons.</td>
<td>60 months. Objective testing at 12 and 36 months.</td>
<td>Average retreatments sought over 60 months = 4.8. No objective change between pretest and final post-test bladder testing. Percent (%) change treatment vs. control group: urge: 30 vs. 3 * capacity: 12 vs. 2 * distress: 57 vs. 32 *</td>
<td>Four dropped out due to no relief. One lost to followup. Positive effect was subjective, temporary.</td>
</tr>
<tr>
<td>Emmons &amp; Otto, 2005</td>
<td>85</td>
<td>51 (22-82)</td>
<td>RCTc of 4 weekly bladder treatments vs. relaxation treatment.</td>
<td>4 weeks</td>
<td>Percent (%) change treatment vs. control group: urge: 30 vs. 3 * capacity: 12 vs. 2 * distress: 57 vs. 32 *</td>
<td>Insufficient numbers to compare groups. No placebo comparison group. Less side effects reported with acupuncture.</td>
</tr>
<tr>
<td>Kelleher et al., 1994</td>
<td>39</td>
<td>[51.2 (21-76)]</td>
<td>RCTc of acupuncture vs. oxybutynin 5 mg twice daily for 6 weeks.</td>
<td>3 months</td>
<td>Change in symptom visual analog scores: (acupuncture vs. medication): Nocturia: 18 *** vs. 11 NSb Frequency: 20 *** vs. 27 *** Urgency: 30 ** vs. 40 *** Change in bladder capacity: 60 cc * vs. 10 cc NSb</td>
<td>Insufficient numbers to compare groups. No placebo comparison group. Less side effects reported with acupuncture.</td>
</tr>
</tbody>
</table>

*QOL = quality of life; bNS = not significant; cRCT = randomized controlled trial

* p<0.05; ** p< 0.01; *** p<0.001
participate, recruitment in populations unfamiliar with this modality may be difficult. For example, Bergstrom et al. (2000) reported that 40% of potential recruits in their trial declined participation. Furthermore, experimental control is hampered in acupuncture trials as practitioners and experienced participants cannot be blinded to treatment arms, and sham treatments may have unknown effects. It has been suggested that placebo effects or the psychological impact of belief in the treatment can best be controlled and compared through use of “credibility of treatment rating scales” in acupuncture trials (Vincent & Lewith, 1995, p. 201). In addition, some practitioners would argue that, although future research with larger study groups, randomization, and controls would help establish efficacy, controlled trials are implicitly inappropriate in acupuncture and other complementary therapies that stress whole body over symptom-specific treatment, and the relationship of the patient and therapist as essential elements of treatment (A.N. Morse, personal communication, August 31, 2005). None of the reviewed articles addressed this potential quandary.

Despite hurdles, U.S. researchers are encouraged to face the challenge of designing quality trials to test efficacy of complementary therapies (NCCAM, 2005). Future controlled studies may lead to further understanding and efficacy in populations with higher prevalence rates: older adults, ethnic and minority groups, or those with co-morbidities that may affect UU and UUI (for example, diabetes mellitus, Parkinson’s disease) (Graham & Mallett, 2001; Stewart et al., 2003). Future evaluation of efficacy should include comparative cost versus benefits analyses, which may change over time as more bladder-specific anticholinergic medications or other effective therapies are developed.

Conclusion

Health care providers should be knowledgeable regarding complementary therapies, and vigilant in watching for harm or evidence of urie rather ineffectiveness (Gammack & Morley, 2004). While the general efficacy of acupuncture is not yet well-established, it has promise as a safe modality for women over 50 with UU or UUI. If effective, temporary symptom relief can be expected with short-term treatment. Research related to the efficacy of acupuncture in the treatment of older women with UUI has been suggested as a research priority in the United States (Griebling, 2004).

References


Department of Health and Human Services.


