

The Treatment of Urinary Incontinence and Frequent Urination: How Modern Scientific Research Can Inform Traditional Acupuncture Practice

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Abstract

Urinary Incontinence (UI) is a common and costly condition, which many people - especially women - suffer to varying degrees. Those most affected often seek medical treatment, whilst those with milder symptoms may simply choose to live with their condition. This latter group may present to practitioners of Oriental medicine with other concerns, and during treatment may report symptoms of UI. This paper outlines the prevalence of UI, its associated OM patterns of disharmony and the treatment strategies recommended in conventional medicine, as well as exploring modern medical research that can inform acupuncture treatment. Based on this research the author proposes acupuncture techniques that might be adapted and used by practitioners of OM.

Introduction

It is estimated that 10 million women in the UK suffer with urinary incontinence (UI) (Hunskarr et al., 2004), at a cost to the National Health Service of 594 million pounds per year (Irwin et al., 2009). Women are more likely to experience the condition if their mother or older sisters have been affected (Hannestad et al., 2004). Childbirth seems to be a causative factor of UI: there is a higher incidence of the condition in those who have had a vaginal delivery compared to caesarean section, with both groups having a higher incidence of UI compared to nulliparous women (Rortveit et al., 2003). Chronic cystitis and other inflammatory urinary diseases have also been found to be essential risk-factors of UI in women (Kulakov et al., 2005). In terms of men, a study by Boyle et al. (2003) found that out of 990 men between 40 and 79 years of age in the UK, 14.4 per cent reported mild to severe UI. Lynn et al. (2005) estimate the medical cost of male UI in the US at 18.8 billion dollars.

Nygaard et al. (2005) found that women perceive UI as a barrier to exercise, while Dallosso et al. (2003) found obesity to be a risk factor for bladder disorders, recommending that diet and lifestyle advice be part of any treatment program. Miller et al. (2003) found the same link with obesity and also found it to be a risk factor for an increasing severity of UI, as was the case for heavy smoking in young women and the use of hormone replacement therapy in older women. In a study by MacDiarmid (2005) half of the 1046 women surveyed stated that in order for them to conclude that treatment had been effective they would desire a greater than 70 per cent reduction in episodes of incontinence.

It is important to note that there is no common

Pattern	Signs and symptoms
Kidney yang deficiency	Frequent urination, nocturia, slight dribbling, incontinence in the elderly, pale urine, exhaustion, dizziness, tinnitus, weak and sore back and knees, feeling cold, a pale wet tongue, and a deep weak pulse.
Kidney yin deficiency	Incontinence of urine but in scanty amounts, dribbling after urination, dark urine, dry throat, dizziness, tinnitus, night-sweating, five-palm heat, insomnia, a red tongue without coating and a floating empty pulse.
Spleen qi deficiency / Spleen qi sinking	Slight incontinence, urgency, frequent desire to urinate and inability to contain it, loose stools, tiredness, poor appetite, a pale tongue and a weak pulse.
Combined deficiency of the Kidney and Spleen	See above.
Lung qi deficiency (Lung qi not controlling the water passages and failing to support the Bladder function of qi transformation)	Frequent urge to urinate with inability to contain it, slight incontinence (often when coughing or sneezing), dribbling, weak voice, tiredness, slight sweating, shortness of breath, a pale tongue and a weak pulse.

Table 1: TCM patterns associated with UI (from Maciocia, 1983)

definition of incontinence, and the reported range of severity of the condition is very broad. For researchers, incontinence may be viewed either as involving anything from leakage of a few drops of urine to a full stream of urine, and studies often include subjects with overactive bladder, where there is no actual wetting of underwear, but rather an increased urge and frequency of urination (Boyle et al., 2003).

The traditional Chinese medicine (TCM) view of incontinence

The following TCM patterns are commonly associated with UI can be seen in Table 1. Treatment of these patterns involves tonifying any deficiency of the appropriate organs. In women, as a consequence of childbirth, there is often weakness of the muscles of the pelvic floor manifesting as slight leakage of urine or a sudden urge to urinate. Such symptoms are seen in Chinese medical terms as deficiency of the Kidney and Spleen; in the experience of the author this is the pattern most commonly seen in clinic. Advancing age appears to be the most common factor for men with UI (Boyle et al., 2003; Lynn et al., 2005), suggesting that the decline in Kidney qi due to ageing is the primary pattern involved.

Anatomy

The bladder receives sympathetic innervation from the first and second lumbar vertebrae, and parasympathetic nerve supply via the second to the fourth sacral foramen. The wall of the bladder is made up of three different layers of smooth muscle, collectively known as the detrusor muscle. Emptying of the bladder happens when acetylcholine is released from the preganglionic nerves (from the second to the fourth sacral segment), which stimulates contraction of the detrusor muscle (Fisher and Frank, 2000; p.135). Stimulation of the sacral nerves involved in urination has been explored in research aimed at alleviating incontinence (see below).

Common treatments

Kegel exercises

Kegel exercises are frequently recommended to help improve urinary function. They involve exercising the pubococcygeal muscles in order to gain greater muscular control in order to exert a stronger closing force over the urethra (Duthie et al., 2007). Dorey et al. (2004) found that 75 per cent of male subjects with post-micturition dribble became asymptomatic after six months of such exercises. However, despite their ease of implementation, low cost, effectiveness (Di Benedetto, 2004) and being the least invasive intervention available, Kegel exercises tend to suffer from poor patient compliance (Price et al., 2010). This

may be due to the brevity of the verbal instructions that are often provided regarding the exercise routine, which gives rise to confusion and misunderstanding. Bump et al. (1991) found that in 25 per cent of cases patients were practicing a form of Kegel exercise that might actually promote incontinence. Another factor may be the amount of time and effort required by the patient to correctly carry out the exercise routine. Although a routine lasting 10 minutes is usually recommended, a closer look at Kegel's work reveals that he suggested the exercises should be performed 300 times per day, using six second contractions and six second rests. This works out at a total daily time of approximately one hour of exercise – far different from the 10 minutes frequently recommended (Perry & Hullet, 1988). Therefore not only does correct technique constitute a barrier to the effectiveness of Kegel exercises, but patient compliance is also severely tested by the hour required each day to perform the exercise routine.

How to perform Kegel exercises

Identifying the correct muscles:

Women: Women should insert a finger inside the vagina and try to squeeze the surrounding muscles. The feeling should be of the vagina tightening and the pelvic floor moving upward. The muscles should then be relaxed, with the feeling of the pelvic floor returning to the starting position.
Men: Men should try stopping the flow of urine during urination. They should not, however, use this urination method when actually conducting the exercises, as this may aggravate symptoms of UI.

Performing the exercises:

The patient should empty their bladder and sit or lie down. The pelvic floor muscles are then contracted and held for six seconds, after which they are relaxed for six seconds. The goal is to repeat this exercise for 20 minutes, three times a day. As with any exercise, it will take some time build up to this frequency and intensity of performance.

Nerve stimulation

Direct stimulation of the sacral nerves has been explored by researchers of UI. Some use transcutaneous electrical nerve stimulation (TENS) through pads applied to the surface of the skin, whilst others use electrodes inserted into the skin. As early as 1878, Saxtorph demonstrated the potential for sacral nerve stimulation (SNS) via direct stimulation of the first to the third sacral segments (Madersbacher, 1999).

Low-frequency, low amplitude stimulation through electrodes: Laycock & Green (1988) found improvement in symptoms of UI after six to 10 sessions of interferential therapy using low-frequency, low amplitude electrical stimulation of the nerve root at S3 (the third sacral foramen) via electrodes applied to the skin (one electrode was under the

seated buttocks and the other attached using a Velcro strap). Although they found it to be both a safe and effective treatment, they note that once treatment ceased the symptoms returned. Schmidt et al. (1999) developed this work further by using techniques for accessing the sacral nerves through the sacral foramina by embedding implants. Their trial was conducted over a period of six months and significant improvements were seen: 47 per cent of subjects were completely dry and 29 per cent had a 50 per cent reduction in symptoms. In contrast to the findings of Laycock and Green (1988), the improvements were maintained for 18 months by subsequent daily stimulation of electrodes applied to the surface of the skin. For acupuncture practitioners it is worth noting that the implants used here are inserted into the skin in much the same way as acupuncture needles (although they are left in place following treatment).

TENS: Moore et al. (1995) cite a variety of research papers that apply TENS via adhesive pads over S3. These trials used continuous TENS over a 24 hour period and gave mixed results. The authors conclude that the difference in results is perhaps due to TENS having a limited effect on those with severe symptoms. However, later research appears to show significant improvements in those with severe symptoms (Hasan et al., 1996; Skeil & Thorpe 2001). Research by Hasan et al. (1996) may be of particular interest to acupuncture practitioners, as they found that the insertion of an electrode into the S3 sacral foramen gave greater improvement than the use of externally-applied TENS pads. Such treatment seems to have much in common with electro-acupuncture applied to the point Zhongliao BL-33.

Acupuncture at Zhongliao BL-33

Shangliao BL-31, Ciliao BL-32 and Zhongliao BL-33 are located over the first, second and third sacral foramina respectively, so one might anticipate that they would have a history of use in the treatment of UI. Whilst Deadman et al. (1998) indicate these points for the treatment of difficult urination, there is little reference for their use in treating incontinence. O'Connor and Bensky (1981) include Zhongliao BL-33 in their recommended points for treating incontinence, although there is no explanation given as to the rationale for its inclusion. Research has addressed the use of acupuncture at Zhongliao BL-33 for UI (Kitakoji et al., 1995; Honjo et al., 2000), although the impetus for this seems to be prior Western research rather than traditional usage. Kitakoji et al. (1995) found that bilateral needling of Zhongliao BL-33 was effective at controlling an overactive bladder, and Honjo et al. (2000) noted improvements following the same procedure (this trial was conducted on those with chronic spinal cord injuries). A further trial by Honjo et al. (2002) also studied Zhongliao BL-33, the authors stating that a 'needle was inserted into each side

of the foramina sufficiently deep for its tip to be close to the sacral periosteum (50–60 mm)' (p673). Such needling may be deeper than is comfortable for many acupuncture practitioners. Therefore, given its anatomical location and correlation with Western medicine procedures and research, the use of Zhongliao BL-33 perhaps deserves greater prominence within the acupuncture community.

Other acupuncture points

Other researchers have investigated a variety of acupuncture points commonly used for urinary disorders. Table 2 provides a brief review of the main research into acupuncture in the treatment of incontinence. All of the trials listed found that acupuncture improved symptoms of UI, although it should be noted that most of the trials have methodological shortcomings.

Electrical stimulation of Fuliu KID-7 and Rangu KID-2

As previously stated, Zhongliao BL-33 and other sacral segmental points have been successfully used in Western medicine to treat UI. The accurate location of this point can be time-consuming and challenging for many TCM practitioners. In addition, the depth to which one is required to needle to obtain results may put some practitioners off using these points. Another option to consider is suggested by research into 'percutaneous tibial nerve stimulation' (PTNS). Stimulation of the tibial nerve has been found to improve bladder function and alleviate incontinence, with long-term relief experienced by subjects (Zinkgraf et al., 2009; Peters et al., 2009; van Balken et al., 2004). The tibial nerve has fibres that arise from the third sacral foramen of the spinal cord. Although many of the research papers are vague about the exact location of the needle/pad used, van Balken et al. (2006) describes the method as follows:

'PTNS is performed in patients placed in the supine position with the soles of the feet together and the knees abducted and flexed ['frog-position']. A 34 gauge stainless steel needle is inserted approximately 3 to 4 cm, about 3 fingerbreadths cephalad [superior] to the medial malleolus, between the posterior margin of the tibia and soleus muscle. A stick on electrode is placed on the same leg near the arch of the foot. The needle and electrode are connected to a low voltage (9 volts) stimulator (Urourge, Coralville, Iowa) with an adjustable pulse intensity of 0 to 10mA, a fixed pulse width of 200 microseconds and a frequency of 20Hz. The amplitude is slowly increased until the large toe starts to curl or toes start to fan. If the large toe does not curl or pain occurs near the insertion site, the stimulation device is switched off and the procedure is repeated. If the large toe curls or toes start to fan stimulation is applied at an intensity well tolerated by the patient. If necessary the amplitude can be increased during the session.'

Author	Acupuncture points used	Comments	Results
Philp et al. (1988)	Shenshu BL-23 Panguanshu BL-28 Mingmen DU-4 Guanyuan REN-4 Qihai REN-6 Sanyinjiao SP-6	No control group used. No explanation of why two different sets of points for different patients. Needles were manually stimulated on insertion and left for 30 minutes. Treatment was weekly for 10-12 weeks	77 per cent of those treated (mixed male/female) showed significant symptomatic improvement at 12 weeks.
Bergström et al. (2000)	Shangliao BL-31 Ciliao BL-32 Zhongliao BL-33 Shenshu BL-23 Sanyinjiao SP-6 Qixue K-13 Quchi L.I-11	No control group used. After obtaining deqi, needles were retained for 25 minutes and stimulated twice during treatment. Treatment was twice weekly for eight to 12 treatments.	53 per cent of women considered themselves 'much improved' at three month follow up.
Kelleher et al. (1994)	Sanyinjiao SP-6 Zusanli ST-36 Zhongji REN-3 Guanyuan REN-4 Shenshu BL-23 Panguanshu BL-28 Additionally, four sacral segmental points chosen 'for possible autonomic effects' (no details given for the location of these points).	All subjects had previously been treated with standard treatments of bladder/pelvic floor training exercises and drug therapy with no improvement.	Acupuncture found to be as effective as oxybutynin (an anticholinergic drug). At three month follow up, 40 per cent of women reported themselves to be symptom free, compared to 36.8 per cent of the oxybutynin group
Ellis et al. (1990)	Sanyinjiao SP-6 Zusanli ST-36	Needles manipulated to obtain deqi and left in situ for 20 minutes. Treatment was daily for two weeks. The control group received mock transcutaneous nerve stimulation in which the pulsing machine lights were on, but the electrodes not connected.	After two weeks of treatment, 45 per cent of those in the acupuncture group (mixed male/female) showed a reduction in urinary frequency, compared to 11 per cent of those in the control group.
Kubista et al. (1976)	Chengshan BL-57 Zusanli ST-36 Henggu KID-11 Qihai REN-6* (* instead of needling REN-6 itself, two points either side of REN-6 were used, with the needles 4-5mm apart and directed inferiorly)	All needles were inserted to a depth of 4-6cm and connected to an electro-acupuncture machine (with a rectangular current of 8Hz, an impulse width of 0.5msec and the current intensity continuously increased during treatment). No details given regarding connection made between pairs of electrodes.	After 30 minutes of treatment 85 per cent (17 out of 20) of women showed an increase in closing pressure of the urethra, compared to 10 per cent of women in the control group.
Emmons and Otto (2005)	Sanyinjiao SP-6 Weiyang BL-39 Panguanshu BL-28 Guanyuan REN-4	Needles manipulated to obtain deqi, then retained for 20 minutes. Four weekly treatments given.	Two to four weeks after acupuncture treatment the number of incontinent episodes reduced by 59 per cent, with significant reductions in urinary frequency and urgency, compared to 40 per cent in the control group.

This type of treatment may be of use to the traditional acupuncturist if the positions of the needles are interpreted as corresponding to Fuliu KID-7 and Rangu KID-2. Using electro-stimulation between the two needles should therefore duplicate the above procedure. Such treatment fits with Chinese medicine theory, as the Kidneys are the paired organ of the Bladder within the Water element. As Maclean

and Lyttleton (1998) state, 'If the qi or yang of the Kidney is weak, the control of the lower yin orifices may be compromised, leading to leakage of urine or incontinence' (p433). According to Deadman et al. (1998), 'Fuliu KID-7, the metal and hence "mother" point of the Kidney water channel, is one of the foremost points to strengthen the Kidney function of dominating body fluids and regulating urination

Table 2:
Research into
the use of
acupuncture
for UI

(p.347). One can see in this instance that the use of Fuliu KID-7 'fits' both with scientific research into UI as well as traditional Chinese acupuncture treatment. Rangu KID-2, a ying-spring point, has the primary role of draining deficient heat, but is also said to regulate the Kidneys and the lower jiao (Deadman et al., 1998).

One of the advantages of this point combination is that it gives the acupuncture practitioner an alternative to having the patient lie prone (which can put uncomfortable pressure on the bladder of the patient). It is also safe, simple to implement and effective. A good electro-acupuncture machine should be able to achieve the pulse width and intensity stipulated by van Balken et al. (2006), although in the experience of the author, even at a low intensity patients will feel a very strong sensation. Practitioners are therefore advised to begin with gentle stimulation and increase this gradually.

Case study

A 65 year-old male patient presented at the clinic of the author complaining of frequent and urgent urination. The patient had been successfully treated two years previously for frequent colds and digestive problems, and therefore came directly for treatment without receiving a Western medical diagnosis. He was waking two to three times a night to urinate, and needed to stop driving to urinate if travelling for more than an hour. The urine was pale, and he experienced occasional back-ache and mild tinnitus. His energy levels were poor and he experienced occasional bloating and indigestion. He had a history of lung damage (due to smoke inhalation whilst working as fireman) and was prone to catching colds, which would then develop into chest infections. At the time of presentation he had a cough with clear phlegm, and reported that he experienced more mucous if he consumed dairy produce. On this occasion, his pulse was slippery and soft, and his tongue was slightly pale with a thin white coat.

Diagnosis: Kidney yang deficiency and Spleen qi deficiency.

Treatment: Treatment principles were to tonify Kidney Yang and Spleen qi. The following points were needed:

- Zusanli ST-36 and Sanyinjiao SP-6 with reinforcing technique to nourish the Spleen and Stomach.
- Zhongji REN-3, Guanyuan REN-4, Qihai REN-6 and Fuliu KID-7 with reinforcing technique to tonify Kidney yang (and the abdomen warmed with a heat-lamp).
- Waiguan SJ-5 was also included to alleviate the tinnitus.

Moxa was not used in this case as the patient objected to the smoke. After two treatments there had been little improvement, so it was decided to introduce electro-acupuncture. For the third weekly treatment, in addition to the points listed above Fuliu KID-7 and Rangu KID-2 were also needed to elicit strong deqi. They were then connected to an electro-acupuncture machine, with

the intensity gradually increased to produce a strong sensation in the underside of the patient's foot (although it was felt to be too strong when it caused the toes to curl). After 10 minutes the patient reported that the sensation of stimulation had become less intense, so the intensity was further increased and left for 10 minutes more.

After two weekly treatments using this protocol, the patient reported that night-time urination had reduced to just once per night, and that a two hour trip in a car was now feasible. At this point the patient felt comfortable to reduce the frequency of his treatment to monthly sessions.

Conclusion

Some of the practices and techniques used in conventional medicine can inform new approaches for the practitioner of Oriental medicine. Needling Zhongliao BL-33 and using electro-stimulation of Fuliu KID-7 and Rangu KID-2 should be therefore be considered as potentially valuable point prescriptions to be used in the treatment of urinary incontinence, frequent urination and over-active bladder. ■

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Advance notice of forthcoming seminar weekend



Whitfield Reaves, the author of *The Acupuncture Handbook of Sports Injuries and Pain*, will be presenting a two-day workshop in the UK on October 8th & 9th 2011. Saturday 8th will be devoted to the shoulder and Sunday 9th to the hip. The workshop will include extensive clinical demonstrations and clinical practice for all participants.

To be informed of further details as they are confirmed, please email info@jcm.co.uk or keep an eye on our website seminars page: www.jcm.co.uk/seminars-events



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