Chinese Medicine in the Treatment of Nocturia and Overactive Bladder

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Background

Overactive Bladder (OAB) refers to frequent urgency to void urine, even when the bladder is not full, and nocturia refers to urgency to void urine during the sleep period at night, with interruption of sleep. OAB can result in nocturia and is one of its leading causes, but not the sole cause. A common explanation for most cases of OAB is that there is dysfunction of the nerve stimulation of the bladder musculature, known as the detrusor muscle, such that it contracts regardless of bladder urine volume. The contraction of this smooth muscle, controlled primarily by the autonomic nervous system, puts pressure on the urethral sphincter, giving the signal that it is now necessary to release urine. In the normally active bladder, there are receptors detecting the stretching of the bladder as it fills with urine, which then indicate the same kind of urgency for voiding, but not until the bladder is substantially filled: voiding occurs with combined contraction of the detrusor and relaxation of the sphincter, which is under voluntary control up to a point.

Many medical writers are quick to point out that neither OAB nor nocturia is an ordinary part of aging, saying so with the hope that people bothered by urination urges will decide to seek treatment. Still, the fact is that OAB and nocturia tend to arise at an age when other health problems are developing, and the incidence of these problems in men and women past middle age is rather high and increases with age. Nocturia is the condition that is especially damaging to health, in that interrupted sleep can result in persistent fatigue and impaired function, while getting up to urinate at night can be a cause of falls that then result in bodily harm, including broken bones, with subsequent reduced physical activity that has additional health impacts.

There are several contributing causes to OAB and nocturia (with potential for involuntary leaking of urine), but hormonal irregularities and hormone declines affiliated with aging are among the major contributors. In women, menopause often brings on these urination disorders and application of vaginal estrogen cream is one of the management methods that is often effective. In men, benign prostatic hypertrophy (BPH) is a contributor, and treatments that reduce prostate swelling, including administration of testosterone when it is deficient, will usually reduce the severity of OAB and nocturia. Aside from medical treatments such as these, there are a number of management techniques that are offered to sufferers (a partial list is presented in the appendix). A drug that influences the rate of kidney production of urine, such as Desmopressin or Tolterodine, can also be of help.

Under normal or ideal conditions, the rate of urine entering the bladder is regulated primarily by an anti-diuretic hormone, arginine vasopressin (AVP), which displays a circadian rhythm that slows the rate of kidney elimination of urine at night, thereby slowing bladder filling to about four to eight hours. When this regulation is fully effective, there will be either no night time waking to void or one instance in the night. The circadian rhythm can become weak or even absent, and then night time bladder filling is basically the same as during the day, resulting in need for voiding at least once or twice. Another hormone, atrial natriuretic peptide (ANP), is pro-diuretic and its production is increased with certain types of cardiovascular distress, such as occurs with hypertension or sleep apnea. In this case, the anti-diuretic action of AVP can be overcome by ANP's pro-diuresis action, increasing bladder filling, especially notable at night when a filled bladder can disturb sleep. While the factors described here are not the only ones involved, they have a key role. Diabetes and obesity, which often accompany hypertension as part of metabolic syndrome, tend to increase urinary frequency. Excessive fluid consumption (which then requires increased fluid elimination), either due to thirst or intentional hyperhydration strategies, necessarily results in more frequent voiding of the bladder.

Higher bladder volume and good flexibility, with strong pelvic floor muscles, as well as the use of mental control mechanisms (deciding when to utilize toilet facilities), allow for some variability of day time voiding according to circumstances. Reduced bladder volume, reduced bladder wall flexibility, weaker pelvic floor muscles, and increased nerve responses that result in sense of urgency for voiding can contribute to reduced time before need to void as well as lower urine excretion stream rate, sometimes with retention of urine, making the next void time sooner. These factors along with hormonal changes in the regulation of kidney urine production can cause night time sleep disturbance.

Chinese Medicine for OAB and Nocturia

Acupuncture is the primary method of therapy for these conditions, and reports of acupuncture treatment for frequent urination and nocturia indicate rapid response, such as within a dozen sessions, so that acupuncture can be tried without having to undertake a prolonged program of therapy that might be time consuming and expensive. A determination of whether or not acupuncture will help an individual should be evident quickly. The acupuncture points used will vary among practitioners, but based on published reports there is a more or less standard set of points derived from the traditional medical system that are utilized for OAB and nocturia, to which other points may be added according to individual health conditions.

The basic treatment involves two points (bilaterally, so four needles) on the lower leg, namely at Taixi (KI-3) and at Sanyinjiao (SP-6), plus one or more points along the centerline of the abdomen (Conception Vessel) in the area of the bladder, usually Guanyuan (CV-4) sometimes combined with Zhongji (CV-3). CV-4 is just over the place where the bladder comes closest to the abdominal wall; CV-3 is close to the base of the bladder where the urethra emerges from it. The same points (with some others added) are utilized in treating disorders of menstruation, ovulation, and fertility; the main link between these applications is the close physical proximity of the urinary bladder and the female reproductive organs (the uterus is just behind and extending just above the urinary bladder). It is possible that this combination of points yields some hormonal regulation that could influence both bladder problems and reproductive system problems. The combination of KI-3, SP-6, and CV-4 is also found in many treatments for emotional lability.

KI-3 is broadly used for deficiency syndromes affecting kidney and bladder; recently, this point has been promoted for use in improving brain function, the origin of this idea is the ancient TCM concept of the brain being an extension of the kidney. SP-6 is one of the most commonly used acupuncture points for deficiency syndromes, and is often selected as a pairing with KI-3 for urinary frequency.

Bladder Meridian points, especially those near the physical bladder organ, have been suggested to affect bladder function, including sensory phenomena that may induce urge to void. Two points are frequently mentioned: Huiyang (BL-35) and Zhonglushu (BL-29), though other points in the same region, such as Ciliao (BL-32) and Zhongliao (BL-33) may be selected as alternative to those or in addition to them. Electro-acupuncture, a method of stimulating the points without requiring prolonged manual manipulation of needles, is often the suggested approach to using the Bladder Meridian points for the urinary disorders.

One reason acupuncture may be especially effective is that some of its effects are manifest through the nervous system, and there is the potential to adjust the neurogenic cause of OAB and nocturia. A medical therapy for OAB is sacral nerve stimulation therapy, where a small device is inserted into the sacral region to provide electrical impulses. These impulses have the basic function of overwhelming the neurologic stimulation of the bladder muscle, so that it reacts to the stretch receptors in the bladder, rather than to extraneous signals. This method is different than electro-acupuncture, where the stimulus is intended for a pulsing at the acupuncture needle for a few minutes, and instead provides a low level interference with signals to the bladder.

Chinese Herbs

Chinese medical texts that make some reference to bladder disorders almost universally focus on relieving obstructed urination and urination with bleeding or pain (commonly referenced as "lin" syndrome). By contrast, frequent urination and urges to urinate either go without discussion or are mentioned in passing as a possible secondary symptom of another disorder. Herb formulas indicated for frequent urination are also used for obstructed urination, implying a general bladder normalizing effect rather than something more specific.

Rehmannia Eight Formula and Modification

Frequent urination is described in the ***Jin Gui Yao Lue*** (ca 200 A.D.) in chapter 13, a short chapter devoted to urination problems. The focal point of this chapter is excessive drinking (polydipsia) due to prolonged experience of thirst that is not relieved much by drinking fluids. A concept behind this experience of persistent thirst is that the fluids are not able to moisten the body due to a process that allows them to bypass dry areas. According to this text, a person who consumes water frequently and excretes an equal amount as urine frequently (polyuria) is to be given Rehmannia Eight Formula (Ba Wei Di Huang Wan; aka Jin Gui Shen Qi Wan). This is the first formula recommended in that chapter and is today one of the most widely used of formulas derived from this book. In the modern western circumstance, where people are encouraged to hydrate, that is, to consume water frequently even in the absence of overt thirst, the volume of urinary excretion is about equal and this formula is deemed appropriate to regulate urination. Rehmannia Eight Formula has remained in use for polyuria, especially for nocturia. The rest of chapter 13 of the ***Jin Gui*** deals with other conditions, mainly having to do with extreme thirst and *limited* urinary excretion (oliguria). Rehmannia Eight Formula is likewise recommended. Elsewhere in the ***Jin Gui*** text, the same formula is suggested for limited urinary excretion; its application to frequent urination is a rare instance.

An ancient model of urinary regulation depicts the kidney system as having a function of dividing water, sending some to the bladder for elimination and "steaming" some to moisturize the rest of the body. This "steamed water" rises and then circulates back down by action of the lungs, and the division of water for urine elimination and for cycling upward continues. The kidney has yin and yang essences, and when the kidney is in a weakened state the regulation of water is adversely affected; when the yang, its warming aspect, has become relatively cold there is less steaming and more draining to the bladder. The bladder fills more quickly and induces the urge to void. So, to treat this condition, the kidney is to be strengthened, returned to its normal functioning, by herbs that benefit both yin and yang, but the yang herbs are to be especially warming so as to overcome the manifestation of frequent urination, and for this Fu Zi (aconite) and Gui Zhi or Rou Gui (cinnamon twig or bark, respectively) may be utilized. Fu Zi and Gui are included in the Rehmannia Eight Formula. A modification of this formula is prescribed in Japan for overactive bladder; it is made from Rehmannia Eight Formula by adding two herbs, Niu Xi (achyranthes) and Che Qian Zi (plantago seed). Most often, these two herbs are utilized in a kidney tonifying regimen when there is accumulation of fluid in the legs, which is considered another symptom that can arise from the water failing to "steam upward." Modern medicine descriptions of OAB and nocturia also mention leg swelling and the potential benefit to managing that condition (such as wearing compression stockings or raising the legs for a while before sleep) as part of an approach to limiting the detrimental impact of OAB and nocturia.

It was noted above that the three acupuncture points used for bladder disorders, such as nocturia, were also used for emotional lability. An herbal formula with both these applications is Sang Piao Xiao San (Mantis Formula) from the ***Ban Cao Yan Yi*** (1116 A.D.) The key ingredient, Sang Piao Xiao, is the mantis egg case (ootheca), a cocoon-like encapsulation for numerous mantis eggs, about 30 to 100 of them, which starts as a foamy excretion and hardens. The mantis produces only a few of these in its life time, but these insects are raised in prodigious quantity both for the medicinal material and as a natural pest control. The egg case has long been established as a treatment for frequent urination and is included, for example, in the ***Bei Ji Qian***

Jin Yao Fang (652 A.D.). This text has a chapter, like that of the ***Jin Gui***, devoted to inhibited urination and thirst. But, the chapter begins with a recommended herb formula for postpartum urinary *frequency* (concurrent with thirst), a condition that can arise as a result of stretched out pelvic organs and muscles. The formula is not well known so worth relaying here: 9 grams each of Ren Shen (ginseng) and Sheng Jiang (fresh ginger), plus 6 grams each of Gua Lou Gen (trichosanthes root), Huang Lian (coptis), Gan Cao (licorice), and Mai Men Dong (ophiopogon), plus15 pieces of Da Zao (jujube) and 20 pieces of Sang Piao Xiao (mantis egg-case). Of the ingredients listed, only Sang Piao Xiao is specific for frequent urination. The formula Sang Piao Xiao San has entirely different ingredients except for two: Ren Shen and Sang Piao Xiao.

The tension between treatment of inhibited urination and frequent urinary urges is evident in the description of Sang Piao Xiao in the ***Shen Nong Ben Cao Jing*** (ca 100 A.D.). Here, it is indicated for "freeing the five types of stranguria (urine tinged with blood) and disinhibits urine and the waterways." The five types of bloody urine refer to the five "lin" conditions and the disinhibiting effect is to overcome difficulty in passing urine. Yet, this same material is used for frequent urination.

Some Chinese scholar-physicians have turned to astringent herbs as a primary focus of therapy. The astringents are utilized to inhibit discharge, and among the astringing herbs, some have an action more specific to one or another type of discharge. Among the applications for the astringent herbs are: discharge of blood (such as coughing up blood, blood in the urine or feces, excessive menstrual bleeding); excessive perspiration; urinary frequency or incontinence; diarrhea; spermatorrhea; and leukorrhea. Of the astringents for fluids other than blood, the most common type of ingredient is a seed or small fruit. Among the seeds are Tu Si Zi (cuscuta), Sha Yuan Zi (astragalus seed), Che Qian Zi (plantago seed), Lian Zi (lotus seed), and Qian Shi (euryale); among the fruits are Shan Zhu Yu (cornus), Jin Ying Zi (rose), Wu Wei Zi (schizandra), and Fu Pen Zi (rubus). Such ingredients may be added to a formulation based on Rehmannia Eight Formula or similar tonic for the kidneys that includes a yang warming effect. An example developed at ITM is called Cuscuta 15, and is predominantly astringent. In relation to urination disorders, the astringent herbs are especially used when there is urinary incontinence from any cause and for nocturia. The application of astringency is based on the theory that the body has releasing and restraining activities that in good health are well balanced and allow just the right amount of discharge and at the proper times. For perspiration, as an example, during intense physical labor and with a fever, perspiration is expected, but spontaneous sweating and especially night time sweating is deemed to be from an imbalance, such as weakness of qi that fails to keep the sweat pores sufficiently closed or deficiency of yin, allowing yang to warm and open the surface. For urination, the release of urine is an essential function but urinary incontinence or frequent voiding, especially at night, is considered an imbalance in which the control of the urinary sphincter is weak as a result of deficiency of the kidney system, which is supposed to regulate the bladder muscle and sphincter responses.

Appendix 1. Personal Management of Nocturia

The first step in the management of nocturia is to set reasonable goals for treatment. While eliminating all nocturnal voiding episodes would be ideal, for most patients a goal of a 50% reduction or no more than 1 to 2 voids per night is a reasonably achievable goal. Complete cessation of nocturia may not be possible.

Evening fluid intake control is often recommended but typically has a minimal impact, this includes: limiting fluid intake in the late afternoon and evening (especially between dinner and bedtime) and, more importantly, restricting the quantity of alcohol and caffeine-containing beverages, which can disturb sleep and reduce the chance of deep sleep. To aid sleep, it is recommended that regular physical activity in the afternoon, such as a long walk, be undertaken. Behavioral therapy is the primary recommended method for urine control and applies to OAB as well as nocturia. One published summary covers the bases:

> Behavioral therapy, which includes pelvic floor muscle training, urge-suppression techniques, delayed voiding, fluid management, sleep hygiene, Kegel exercises, and peripheral edema management, has been shown to be reasonably efficacious both when used alone or together with pharmacological therapy in controlling nocturia. Behavioral therapy in men, alone or combined with alpha-blocker therapy, has consistently shown large and statistically significant reductions in nocturia episodes and favorable effects on sleep and quality of life. Based on these findings, behavioral therapy may provide a meaningful treatment option for men with nocturia. The standard, recommended, pelvic muscle training protocol is 3 repetitions of a series of eight to twelve slow pelvic contractions or compressions that are held for a duration of 6 to 8 seconds each. This is typically done 3 or 4 times a week and usually continues for at least 3 months.

The term "sleep hygiene" may be misunderstood because of the more common use of "hygiene" to indicate cleanliness. There is a related meaning here: while good cleanliness practices help avoid experiencing infections, sleep hygiene involves practices that help avoid sleep disturbance. Strategies include minimizing light intrusion (including lights that are often active on electronic equipment), reducing or overcoming noise intrusion (potentially using white noise or other background sounds to even out intermittent external sounds that can cause waking), having comfortable bedding, keeping room temperature moderate and blankets suited to the temperature range that is good for sleep, avoidance of using "screens" at bedtime, (e.g., television, computers, smart phones), avoid eating and drinking late, minimize spending time in bed for a prolonged period beyond what is needed for sleep, and maintaining to the extent possible a consistent sleep schedule. Natural therapies, such as taking melatonin, a hormone that regulates the sleep cycle, and ingesting extra calcium and magnesium, may improve sleep and thereby reduce waking with only a partially filled bladder.

Two training methods mentioned above involve:

1) pelvic floor muscle training, Kegel exercises
2) urge-suppression techniques and delayed voiding

These methods are done during the day repeatedly to alleviate OAB but also to avoid urination problems at night. Kegel exercises are one of the pelvic floor muscle training techniques of the squeeze and release type. This muscle training involves tightening muscles, and then releasing (relaxing), either after a few seconds of holding tightly (Kegel) or very quickly releasing after each muscle constriction. While these exercises sound easy, in fact one of the main problems with these pelvic floor strengthening techniques is that they are somewhat uncomfortable (not painful), they are unusual, and they don't provide obvious progress as one can see in arm exercises or abdominal exercises (such as sit-ups or crunches) where muscle definition develops. Pelvic floor exercises of this kind are done privately rather than in a group setting where encouragement is gained by the efforts of others. Therefore, there is a tendency to discontinue the practices prior to their having a sufficient effect, though persistence will have its reward. To keep these muscles strong, the exercise has to be repeated over time and not done for just one series.

The other main type of pelvic floor muscle training is to hold postures (such as done in yoga practice) or do repetitions of muscle building exercises that affect the surrounding area, such as squats. While these techniques are less specific for urinary control, they do assist in strengthening all the pelvic muscles. These exercises may be part of a broader set of postures and movements; practicing them can be encouraged through participating in group training, and they may display other benefits as well.

Urge suppression is aimed at relaxation and distraction from the voiding urge sensation coupled with a few rapid squeeze and release actions. If the urge to urinate is reduced by doing so, then one can delay voiding for a while, and with regular practice of this technique, the frequency of voiding can be lessened and when

this becomes the norm over time, the problem of overactive bladder is substantially alleviated. By doing these practices during the day, night time urges become less frequent as well.

Especially for older individuals, risk of falling associated with getting up to urinate at night can be reduced by making sure the pathway from bed to toilet is without obstacles or slippery surfaces and adequate night time light is turned on to help avoid glancing contact with doorways or hall passages.

In the event that the behavioral aspects plus any involvement with Chinese medicine (acupuncture and/or herbs) fails to attain adequate control, medications may be necessary, especially for nocturia. The range of available pharmacological interventions is now quite large and it would be up to the prescribing physician to discuss with the patient which drugs to try initially and then making any changes in drug choice afterward.

Resources

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