

Original Article

Acupuncture Efficacy in the Treatment of Persistent Primary Nocturnal Enuresis

Mohamed Abd EL Hakam El Koumi*¹, Saber AL Sayed Ahmed², Ahmed Mohamed Salama³

1. Departments of Pediatrics, Faculty of Medicine, Zagazig University, Egypt.

2. Departments of Pediatrics, Scientific research institute, Egypt.

3. Department of Anesthesia and Acupuncture, Faculty of Medicine, Zagazig University, Egypt.

Abstract

Introduction: This study aimed to assess the therapeutic efficacy of traditional Chinese acupuncture in the treatment of persistent primary nocturnal enuresis (PNE).

Methods: Fifty children and adolescents suffering from persistent PNE were recruited from the Pediatrics and Urology Outpatient Clinic of Zagazig University Hospital during the year 2010. They included 31 boys and 19 girls, with a mean age of 11.6± years (range 9–17 years). The children and their parents underwent thorough counseling followed by two courses of treatment, each course administered over 10 consecutive days. Patients were instructed to continue regular follow-up, every three months, after starting the therapy. The response rate (cure, improvement, or failure) was monitored by recording dry nights and the number of spontaneous arousals to void per week on a calendar. Children who showed partial or no response after six months of observation received another two courses of acupuncture therapy, and were followed up for a further six months period.

Results: After the initial two courses of treatment, the cure rate at six months was 76% with an additional 18% achieving partial improvement. Twelve children needed another two courses of treatment. After one year of follow-up, 92% of patients showed complete cure and 8% showed failure of acupuncture therapy.

Conclusion: Acupuncture treatment in patients with PNE appears effective in increasing the percentage of dry nights, with stable results even after the end of treatment courses. Further controlled studies are needed to confirm these results and to elucidate the therapeutic mechanism of acupuncture.

Keywords: Acupuncture Therapy; Nocturnal Enuresis; Traditional Medicine

The authors declared no conflict of interest

Introduction

Primary nocturnal enuresis (PNE) is currently defined as involuntary voiding of urine during sleep at least twice per week in children over 5 years [1]. This diagnosis requires exclusion of congenital or acquired defects of the central nervous system and the absence of diuretic substances [2]. Epidemiological studies in western countries have reported the prevalence of PNE to be 13–19% in boys and 9–16% in girls above five years of age. At the age of 16 years, 1–2% of boys and girls continue to be affected by PNE [3]. Mild or moderate enuresis (less than 3 wet nights per week) is common and often resolves spontaneously. Severe enuresis (wetting every night) is uncommon and resolution rates are poor particularly after 10 years of age. PNE represents the least pathological end of the spectrum of ‘the wetting child’. However, it is often a source of considerable heartache to the child and his/her parents and can be challenging and disheartening to the professionals approached for help [4]. Current medical treatment for the child with PNE centers on the three main pathological causes of the condition: lack of arginine–vasopressin activity; bladder over activity; and the inability to wake to void [5]. The most commonly used medical treatments are pharmacological therapies including desmopressin, tricyclics, or oxybutynin and behavioral therapies [6]. Alternative treatments such as biofeedback, acupuncture, and hypnotherapy also exist [3]. Although the use of acupuncture and Chinese herbal medicine for adults has grown widely in the USA, Oriental medicine is used less frequently in the treatment of children, and relatively few

* Corresponding author; E. mail: mohamed_197228@hotmail.com

Table-1: Frequency of bedwetting in the studied 50 children with primary nocturnal enuresis

Frequency of bedwetting	Number	Percentage
3 times /week	3	6%
4-6 times /week	14	28%
Every night	33	66%

Table-2: Pharmacologic therapies received by the studied 50 children for primary nocturnal enuresis

Drug(s)	Number	Percentage
Tricyclic antidepressant	6	12%
Desmopressin	5	10%
Oxybutynin	5	10%
Tricyclic antidepressant and oxybutynin	23	46%
Triple therapy	11	22%

Table 3: Initial response, after two courses of acupuncture therapy among 50 children suffering from persistent primary nocturnal enuresis

Response	Number	Percentage
Cure	38	76.0
Improvement (partial cure)	9	18.0
Failure	3	6.0

practitioners actually specialize in pediatrics [7]. The word “acupuncture” is originally derived from Latin and refers to piercing with a sharp instrument. The practice uses the concept of 12 primary meridians or energy channels along which are distributed 360 acupuncture points. Each point is located in an area of low electrical resistance, and sites used to treat bladder dysfunction appear to coincide with innervation by spinal sacral segments S2 through S4. Stimulation of these acupuncture points by manual pressure, penetration of the skin, heating, the application of laser, electrotherapy, or moxibustion is thought to induce homeostatic changes [8]. Most practitioners agree that optimal results will be obtained if a patient experiences the spread of treatment sensation (including numbness, heaviness, distension, and soreness) beyond the acupuncture site, a condition known as “de Qi” [9].

A recent Cochrane Systematic Review assessed different procedures employed in clinical trials to treat enuresis, but was confronted by the lack of large controlled trials in this area [10]. However, one small trial found that acupuncture had better results than sham control acupuncture (RR for failure or relapse after stopping treatment 0.67, 95% CI 0.48 to 0.94) [10]. The aim of the current study was to evaluate the efficacy of acupuncture treatment in curing children suffering from PNE who did not respond to behavioral and pharmacological therapy.

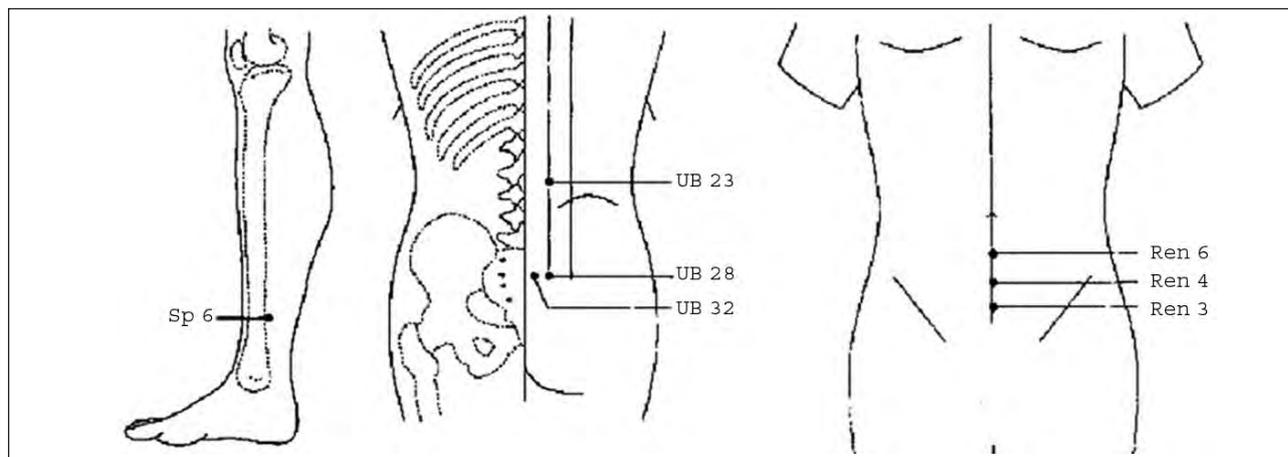
Methods

The study included 50 children and adolescents suffering from primary nocturnal enuresis (PNE) who attended the Pediatrics and Urology Outpatient Clinic of Zagazig University Hospitals, during the year 2010. They included 31 boys and 19 girls with a mean age of 11±6 years (range 9–17 years) who had nocturnal enuresis of ≥2 nights per week during two weeks of observation (Table-1). All patients had documented persistent PNE that did not respond to pharmacological treatments and behavioral therapy (Table-2). Patients with history of urinary tract infections, bladder dysfunction, psychiatric disorders, neurourological disorders, or other medical problems were referred to specialized clinics for further management and were excluded from the study.

The children and their parents were counseled about the therapy and its administration, the calendar system and the treatment goals. They were also instructed to continue follow-up at every three months after starting the therapy. Traditional Chinese acupuncture points (acupoints) are shown in Figure-1 [11]. Acupuncture treatment required disposable acupuncture needles to be inserted into acupoints (UB67, UB28, UB23, Ren3, and Ren4); moxibustion applied to these points was also accepted. The treatment was applied over 30 minutes for 10 consecutive days in a month, and each patient received two courses of treatment [12].

The progress of therapy was monitored objectively using a calendar completed each morning by the parents and the child. Calendars were evaluated during each three-monthly visit. The parameter used to evaluate therapeutic response was the average number of dry nights per week over a period of six months. Treatment outcome was evaluated over a six months period as follows [13]; cure: enuresis disappeared, or the sick child could wake up voluntarily at night to micturate, on all nights; improvement: the sick child could wake up voluntarily at night to micturate and the average number of dry nights were more than before with enuresis occurring in less than 20% of nights; failure: the child’s condition did not change.

Figure-1: Local acupuncture points used for the treatment of nocturnal enuresis (Ren: renal; Sp: spleen; UB: urinary bladder)



Results

Within six months, 38 children (76%) were completely dry and/or could wake up voluntarily at night to void. In nine children (18%) the condition improved with the treatment. They could wake up at night to micturate (i.e. developed nocturia) and bed-wetting occurred only occasionally (<20% of nights). In three children (6%) the condition showed no change (Table-3).

The twelve patients who had partial cure or failure of therapy received another course of acupuncture and were kept under follow-up for another six months. Eight children (66.7%) achieved complete cure while four children (33.3%) did not respond.

After one year of follow-up, the final response to acupuncture therapy of persistent PNE accounted for complete cure without relapse in 46 children (92%) and failure of treatment in four children (8%). No side effects were reported during the treatment.

Discussion

PNE can be caused by nocturnal polyuria, inability to wake up, and a constitutionally small bladder [4]. PNE persisting into adult life can be a very distressing symptom with significant implications for self-esteem and for developing relationships. In addition, adults presenting with lower urinary tract symptoms who had a history of enuresis beyond the age of 6–7 years, appear to have a higher incidence of overactive bladder, particularly in men. PNE must be treated actively as it can result in low self-esteem, secondary psychological problems, and low school performance of affected children [2, 14]. In

this study, traditional Chinese acupuncture was applied to treat persistent PNE in older children and adolescents (≥ 9 years). Realizing the small spontaneous remission rate of 15% per year it was felt that these children needed help to deal with the psychosocial issues relating to bedwetting. The treatment was directed toward alleviating the symptoms of PNE because the exact pathophysiological mechanisms involved are unclear. In this study, all patients had documented persistent PNE that did not respond to pharmacological treatments or behavioral therapy. Research dating back to 1958 has identified spinal and peripheral nerves and their terminals dispersed within 5 mm of known acupuncture meridians. Nerves from such acupuncture points feed into the same area of the spine as certain viscera that have long been linked with such points [15]. More recently, high concentrations of neuroendocrine transmitters and hormones have been identified at acupuncture points. Furthermore, needling or mechanical stimulation of these points induces release and spread of neurotransmitter substances [9]. An autonomic response occurs during acupuncture, as evidenced by significant reduction in average heart rate during treatment [16]. Such a theoretical framework provides some evidence in support of the potential efficacy of acupuncture for PNE [9]. In this study, the initial response after two courses of acupuncture therapy for patients suffering from persistent PNE was a complete cure without relapse in 76% of patients. Non respondents and those who showed only partial response to initial therapy received another course of acupuncture therapy, with complete cure achieved in 66.7% (eight of 12 patients). Thus, final response of PNE

to acupuncture therapy was a complete cure in 92% of patients and no side effects were reported. Similar results were obtained by other studies [12, 13, 17-19]. Given the good overall success rate in the treatment of enuresis with traditional Chinese acupuncture and its safety, this treatment seems attractive for treating patients with PNE especially in the preadolescent and adolescent periods. The cure rates achieved in this study are much better than the spontaneous resolution rate of 15% per year.

There are several important limitations to our study which include the small sample size and the lack of a control group. Moreover, counseling and calendar systems may be considered as form of behavioral therapy which, as such, could have contributed to the study outcome.

Conclusion

Acupuncture treatment for children suffering from persistent nocturnal enuresis appeared to be effective both in terms of the percentage of dry nights at the end of treatment and the stability of results. Larger and controlled trials are needed to confirm these results and to elucidate the therapeutic mechanism of acupuncture.

Acknowledgement

We would like to thank the team of pain and acupuncture clinic and voiding dysfunction clinic, Zagazig University, Egypt, for their contribution.

References

1. Culbert TP, Banez GA. Wetting the bed: integrative approaches to nocturnal enuresis. *Explore (NY)*. 2008 May-Jun;4(3):215-20.
2. Egemen A, Akil I, Canda E, Ozyurt BC, Eser E. An evaluation of quality of life of mothers of children with enuresis nocturna. *Pediatr Nephrol*. 2008 Jan;23(1):93-8.
3. van Poecke AJ, Cunliffe C. Chiropractic treatment for primary nocturnal enuresis: a case series of 33 consecutive patients. *J Manipulative Physiol Ther*. 2009 Oct;32(8):675-81.
4. Weaver A, Dobson P. Nocturnal enuresis in children. *J Fam Health Care*. 2007;17(5):159-61.
5. Butler RJ. Childhood nocturnal enuresis: developing a conceptual framework. *Clin Psychol Rev*. 2004 Dec;24(8):909-31.
6. Dogan HS, Akpınar B, Gurocak S, Akata D, Bakkaloglu M, Tekgul S. Non-invasive evaluation of voiding function in asymptomatic primary school children. *Pediatr Nephrol*. 2008 Jul;23(7):1115-22.

7. Jindal V, Ge A, Mansky PJ. Safety and efficacy of acupuncture in children: a review of the evidence. *J Pediatr Hematol Oncol*. 2008 Jun;30(6):431-42.
8. Berman BM. Clinical applications of acupuncture: an overview of the evidence. *J Altern Complement Med*. 2001;7 Suppl 1:S111-8.
9. Libonate J, Evans S, Tsao JC. Efficacy of acupuncture for health conditions in children: a review. *ScientificWorldJournal*. 2008 Jul 13;8:670-82.
10. Huang T, Shu X, Huang YS, Cheuk DK. Complementary and miscellaneous interventions for nocturnal enuresis in children. *Cochrane Database Syst Rev*. 2011 Dec 7;(12):CD005230.
11. Bower WF, Diao M. Acupuncture as a treatment for nocturnal enuresis. *Auton Neurosci*. 2010 Oct 28;157(1-2):63-7.
12. Serel TA, Perk H, Koyuncuoğlu HR, Koşar A, Celik K, Deniz N. Acupuncture therapy in the management of persistent primary nocturnal enuresis--preliminary results. *Scand J Urol Nephrol*. 2001 Feb;35(1):40-3.
13. Honjo H, Kawauchi A, Ukimura O, Soh J, Mizutani Y, Miki T. Treatment of monosymptomatic nocturnal enuresis by acupuncture: A preliminary study. *Int J Urol*. 2002 Dec;9(12):672-6.
14. Hjalmas K, Arnold T, Bower W, Caione P, Chiozza LM, von Gontard A, Han SW, Husman DA, Kawauchi A, Läckgren G, Lottmann H, Mark S, Rittig S, Robson L, Walle JV, Yeung CK. Nocturnal enuresis: an international evidence based management strategy. *J Urol*. 2004 Jun;171(6 Pt 2):2545-61.
15. Cai W. Acupuncture and the nervous system. *Am J Chin Med*. 1992;20(3-4):331-7.
16. Wu MT, Hsieh JC, Xiong J, Yang CF, Pan HB, Chen YC, Tsai G, Rosen BR, Kwong KK. Central nervous pathway for acupuncture stimulation: localization of processing with functional MR imaging of the brain--preliminary experience. *Radiology*. 1999 Jul;212(1):133-41.
17. Bower WF, Diao M, Tang JL, Yeung CK. Acupuncture for nocturnal enuresis in children: a systematic review and exploration of rationale. *NeuroUrol Urodyn*. 2005;24(3):267-72.
18. Serel TA, Perk H, Koyuncuoğlu HR, Koşar A, Celik K, Deniz N. Acupuncture therapy in the management of persistent primary nocturnal enuresis--preliminary results. *Scand J Urol Nephrol*. 2001 Feb;35(1):40-3.
19. Yuksek MS, Erdem AF, Atalay C, Demirel A. Acupressure versus oxybutinin in the treatment of enuresis. *J Int Med Res*. 2003 Nov-Dec;31(6):552-6.