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Acupressure versus Oxybutinin in the Treatment of Enuresis

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We aimed to assess the efficacy of acupressure for treating nocturnal enuresis, compared with oxybutinin. Acupressure was administered to 12 patients by their parents, who had been taught the technique. Pressure was applied at acupuncture points Gv4, Gv15, Gv20, B23, B28, B32, H7, H9, St36, Sp4, Sp6, Sp12, Ren2, Ren3, Ren6, K3 and K5. Twelve control patients received 0.4 mg/kg oxybutinin. Parents were asked to record incidences of bed-wetting and patients and/or parents completed a questionnaire 15 days and 1, 3 and 6 months after the start of treatment. Complete and partial responses after 6 months of treatment were seen in 83.3% and 16.7%, respectively, of patients treated with acupressure, and in 58.3% and 33.3%, respectively, of children who received oxybutinin. In conclusion, nocturnal enuresis can be partially treated by oxybutinin but acupressure could be an alternative non-drug therapy. Acupressure has the advantages of being non-invasive, painless and cost-effective.

KEY WORDS: Acupressure; Oxybutinin; Nocturnal enuresis; Children

Introduction

Acupuncture and acupressure (shiatsu), used for over 5000 years in Eastern medicine, are becoming increasingly popular worldwide.[1] According to Eastern medicine there is an equilibrium between the bipolar forces of Yin and Yang, and diseases result from disruption of this equilibrium. Acupuncture and acupressure are believed to restore the equilibrium.

Acupressure involves using the fingers, thumbs, palms, heels of the hand and elbows to apply pressure and stimulate specific points along the meridians (or energy channels) of the body. In acupuncture, needles are inserted at these points. Acupressure is not as well known as acupuncture, but is rapidly gaining acceptance as a safe, cost-effective, non-invasive, non-pharmacological form of therapy.[1]

Oxybutinin is an anti-cholinergic drug used to treat enuresis, as it increases the capacity of the bladder and detrusor activity. Its side-effects are cycloplegia (inability to accommodate to near vision), tachycardia and decreased salivary secretions.

This study aimed to determine the efficacy and safety of acupressure as treatment for patients with nocturnal enuresis, especially those not wanting drug or acupuncture therapy.

Patients and methods

PATIENTS

Patients scored as American Society of Anesthesiologist class I/II with nocturnal

enuresis were studied. Children who had organic urinary tract disorders (i.e. urinary tract infection, vesico-ureteral reflux or posterior urethral valve), or who had taken drugs that would affect voiding function and the bladder, were excluded from the study. The study methods were explained to the patients and/or their parents, and written informed consent obtained. Ethical approval for the study was not sought.

Patients were divided into two groups to receive acupressure (group A) or oxybutinin (group O). Parents were asked not to get angry with their children before bedtime. The children were encouraged to pass urine every 2 h until bedtime, and to restrict their fluid intake in the 4 h before they went to bed. The children were told that nocturnal enuresis is a common problem and that acupressure would make them better.

TREATMENT

The classic acupuncture points (Gv4, Gv15, Gv20, B23, B28, B32, H7, H9, St36, Sp4, Sp6, Sp12, Ren2, Ren3, Ren6, K3 and K5) were slightly finger massaged for 5 seconds per day. Parents were taught to administer the treatment. Oxybutinin (0.4 mg/kg) was administered to the patients in group O, orally, once a day. All children were evaluated after 15 days, 1, 3 and 6 months by questionnaire. Parents were asked to record the number of times the patient wet the bed per week.

Patients who did not bed-wet after treatment had started were defined as complete responders; a reduction in the incidence of bed-wetting was defined as a partial response. No reduction and progression were accepted as negative responses.

STATISTICAL ANALYSIS

Statistical analysis of data among treatment groups was performed by SPSS for Windows® (version 10.0) statistical package (SPSS Inc., Chicago, IL, USA). Patient characteristics were analysed using the independent sample *t*-test. Complete response, partial response and negative response were analysed using 2×2 contingency χ^2 or 2×2 contingency Fisher's exact test. A P-value < 0.05 was considered statistically significant.

Results

Twenty-four children were enrolled in the study and randomized to two groups of 12 patients. Details of age and gender are given in Table 1. The mean age was 7.67 ± 2.34 years and 7.41 ± 2.67 years in groups A and O, respectively. Three patients (two girls and one boy) had received unsuccessful pharmacological treatment before the start of this study, so were allocated to group A.

The number of complete, partial and non-responders in each group at various time intervals after start of treatment are given in Table 2. At each time-point there was no significant difference between the number of complete responders in each group, but the percentage was higher in group A than in group O.

TABLE 1:
Demographic data for the 24 paediatric patients with enuresis enrolled in this study who were treated with acupressure (group A, $n = 12$) or oxybutinin (group O, $n = 12$)

Age	4	5	6	7	8	9	10	11	12	13
Group A (M/F)	0/0	2/0	1/2	1/1	0/1	0/1	1/0	0/1	0/1	0/0
Group O (M/F)	0/1	1/1	2/0	0/3	1/0	0/0	1/0	0/1	0/0	0/1

M, male; F, female.

TABLE 2:
Results of treating the 24 paediatric patients with enuresis with acupressure (group A) or oxybutinin (group O)

Response	Group	Time after start of treatment			
		15 days	1 month	3 months	6 months
Complete	A	3 (25.0%)	7 (58.3%)	9 (75.0%)	10 (83.3%)
	O	1 (8.3%)	3 (25.0%)	6 (50.0%)	7 (58.3%)
Partial	A	7 (58.3%)	4 (33.3%)	3 (25.0%)	2 (16.7%)
	O	5 (41.7%)	6 (50.0%)	4 (33.3%)	4 (33.3%)
None	A	2 (16.7%)	1 (8.3%)	0 (0.0%)	0 (0.0%)
	O	6 (50.0%)	3 (25.0%)	2 (16.7%)	1 (8.3%)

Discussion

Rare complications, such as nerve damage, pneumothorax and infectious disease transmission, have been reported for acupuncture,[2 - 5] but not acupressure. Increased β-endorphin levels in human cerebrospinal fluid have been found after acupuncture stimulation,[6] and are expected after acupressure as it uses the same mechanism of action. β-Endorphin was found to depress bladder contractions.[7,8] Backon found a link between noradrenergic activity and the Yin–Yang hypothesis, so suggested that thromboxane is the key element in noradrenergic overactivity. Inhibiting thromboxane and concomitantly activating opiate receptors can inhibit noradrenergic overactivity, therefore stimulating acupoints may treat enuresis and a wide range of other disorders.[9]

Several groups have studied the effects of acupuncture or similar non-drug treatment on enuresis. Bartocci and Lucentini[10] compared acupuncture with micro-massage. They treated 15 patients for 20 days and reported 70% complete recovery with acupuncture and 40% with micro-massage. The effects of a long series of electro-acupuncture sessions on 25 patients were complete recovery in 65% of patients at the 6-month follow-up.[11] A different study applied electro-acupuncture to 162 children with nocturnal enuresis once a day for 10 days, and their success rate was 98.2%.[12] Traditional acupuncture resulted in complete recovery in 43 out of 50 patients (86%) with persistent primary nocturnal enuresis within 6 months.[13] A study of 20 children with enuresis and detrusor instability found that acupuncture suppressed evidently uninhibited bladder contractions in 11 cases.[14]

Acupuncture has also been compared with drug therapy. Radmayr *et al.*[15] reported no significant differences between pharmacotherapy with desmopressin and laser acupuncture.

In general, our results agree with these studies, but there are some differences in recovery rates. Using different acupoints, methods of treatment application (acupuncture versus acupressure) and duration of treatment could cause such differences. Parents in both groups followed our practical advice guidelines. We think therefore that the parent's attitude to the condition was similar between the two groups and did not affect the results. To our knowledge, this is the first report that nocturnal enuresis can be treated by acupressure.

Hehir and Fitzpatrick aimed to determine the effect of oxybutinin on incontinence in spina bifida patients and reported that cure or significant improvement was achieved in 66.6% of patients.[16] Another study showed that combined treatment with a tricyclic antidepressant and an anticholinergic reduced monosynaptic nocturnal enuresis by 90.9% after 6 months of drug administration; combination therapy was more effective than monotherapy with either drug.[17] De Grazia and Cimador administered a combination of desmopressin and oxybutinin to children with enuresis and voiding disturbance and found that 93.2% had recovered after 6 months.[18] A positive response to treatment was also observed in 65.25% of patients with urodynamically demonstrated detrusor hyper-reactivity treated with oxybutinin and imipramine.[19] Finally, oxybutinin was found to treat vesico-ureteral reflux and detrusor instability in the majority of patients in a study by Batista Miranda *et al.*[20]

In our study, we used a low dose of oxybutinin, and we think that the effect would have been greater if oxybutinin had been used in combination with another drug rather than as monotherapy.

Conclusion

Enuresis can be treated with oxybutinin, but the results may not be satisfactory. Acupressure is a non-invasive, painless, cost-effective, and easy-to-apply therapy and should be considered as an alternative treatment for children with nocturnal enuresis. The success rate of acupressure was high in our patient group, but because the number of patients is small, these results should be confirmed by a larger randomized, controlled series.

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