Nonpharmacological treatment of lower urinary tract dysfunction using biofeedback and transcutaneous electrical stimulation: a pilot study

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OBJECTIVE

To report a series of children with lower urinary tract dysfunction (LUTD) whose urge syndrome was treated by electrical stimulation, and their voiding dysfunction by biofeedback; none of the children were using anticholinergic drugs during treatment.

PATIENTS AND METHODS

In all, 36 children who presented with symptoms of urinary urgency and/or daily incontinence completed the treatment and were prospectively evaluated. The mean (range) follow-up was 13.8 (4–24) months, and their mean age 7 (3–14) years, 17 children were aged <5 years. The children were divided into two groups: group 1, with urge syndrome treated with superficial parasacral electrical stimulation, and group 2, with voiding dysfunction, treated with biofeedback.

RESULTS

In group 1, the mean (range) number of electrical stimulation sessions was 13.1 (4–20). Of the 19 children treated, 12 had a complete clinical improvement, six a significant improvement, and one a mild improvement. In group 2, the mean (range) number of biofeedback sessions was 6 (4–14). Of the 17 children treated, there was complete improvement of symptoms in 10, significant improvement in two and mild improvement in five. Six children who had no resolution of symptoms after biofeedback had salvage therapy with electrical stimulation, after which four had complete improvement of symptoms, and two a 90% and 40% improvement, respectively. Taking the two groups together, after treatment, four children developed isolated episodes of urinary tract infection. Of 21 children with nocturnal enuresis, bed-wetting continued in 13 (62%) after treatment.

CONCLUSION

In this short-term follow-up, the nonpharmacological treatment of voiding dysfunction using biofeedback, and of urge syndrome by electrical stimulation, was effective for treating LUTD in children.

KEYWORDS

urinary tract infection, bladder, children, dysfunction, neurogenic bladder, vesico-ureteric reflux

INTRODUCTION

Lower urinary tract dysfunction (LUTD) is associated with psychological and behavioural alterations, and with UTI, VUR and renal scarring [1–3]. LUTD is classified as urge syndrome or urge urinary incontinence (UI) when there is only a disturbance in the bladder-filling phase, and as dysfunctional voiding when there is vesicoperineal dyscoordination (VPD) in the voiding phase. Classically, LUTD is managed with anticholinergic drugs, independent of whether it is related to bladder filling or voiding disturbance. However, according to Reinberg *et al.* [4], the symptoms of urgency and daily UI were resolved in <30% of children treated with oxybutynin or tolterodine, although most had their symptoms improved. In addition, the rate of side-effects is not low [5]; symptoms like dryness of mouth, constipation, flushing and hyperthermia, caused complete intolerance in ≈10% of children [6]. Furthermore, considering that the treatment requires daily, oral ingestion of the drug, adherence to prolonged usage may be difficult.

The treatment of voiding disturbance with drugs has been substituted by biofeedback training of the pelvic floor muscles. Nevertheless, the great majority of biofeedback series associate this pelvic floor training with anticholinergic drugs, which makes the results difficult to interpret.

Patients with urge syndrome were not included in the biofeedback studies, and continue to be treated with medication. Electrical stimulation is occasionally proposed for such patients, but most series used invasive means to administer electrical stimulation, which are unsuitable for children with no neurological abnormalities. Hoebeke *et al.* [7] reported the only study in children using transcutaneous (superficial) electrical stimulation over S3. At 1 year after treatment there was resolution of symptoms in 51% of the children. However, there are problems with this interesting study; electrical stimulation was applied at a low frequency (2 Hz), with long sessions (2 h), and over a long period (6 months), and the results are difficult to interpret because the children took anticholinergics during the treatment.

Considering the possibility of successful treatment across the spectrum of LUTD through biofeedback and electrical stimulation techniques with no medication,