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CASE REPORT

Acupuncture for the treatment of overactive bladder

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Abstract

This evidence-based case report documents the use of acupuncture on a subject with symptoms of overactive bladder, a common problem for patients presenting to the specialist continence physiotherapist. The first author (P.G.) has recently developed a special interest in the use of acupuncture as an alternative/adjunct to the traditional conservative management of urinary dysfunction. Her initial experience is that acupuncture results in subjective positive effects. This finding is consistent with the eight full-text articles obtained that support the use of acupuncture in this client group.

Keywords: acupuncture, frequency, overactive bladder, urge urinary incontinence, urgency.

Introduction

Overactive bladder is defined as urgency with or without urge incontinence, usually associated with frequency and nocturia (Abrams *et al.* 2002). In a European survey of 16 776 adults, Alhasso *et al.* (2006) reported that overactive bladder (OAB) had a prevalence of 16.6%. In discussions with numerous patients with mixed urinary incontinence, defined as the involuntary leakage of urine associated with urgency, and also with exertion, effort, sneezing or coughing (Abrams *et al.* 2002), anecdotal reports suggest that OAB may present secondary to symptoms of stress urinary incontinence. The development of OAB symptoms may occur as a coping mechanism. Patients become preoccupied with emptying their bladder in order to avoid episodes of stress leakage. A learned behaviour pattern occurs, resulting in an almost constant sensation of needing to void. However, it should be noted that OAB can occur in isolation. Its pathophysiology is yet to be fully explained.

Various conservative methods may be used to help manage the symptoms of OAB. These include pelvic floor muscle exercises, bladder retraining and electrical stimulation. Alternatively, medication is often prescribed to reduce the symptoms of OAB. In the present case, the subject had tried all of these methods of treatment, but was not satisfied with the outcome.

Acupuncture involves the insertion of fine needles into specific points of the body to influence the flow of energy (qi) within 'meridians' (invisible pathways) and organs. There are two concepts of acupuncture practice, the traditional Chinese medicine (TCM) approach and Western acupuncture. Lee *et al.* (2004, cited by Sung & Jiaqi 2006) described how TCM uses the theories of 'yin', 'yang' and 'qi'. Harmony occurs when yin and yang are balanced; this balance is determined by the presence of the flow of qi, blood and body fluids. Western acupuncture is more scientific, and is based upon anatomy, physiology and pathology in the belief that acupuncture points correspond to physiological and anatomical features (Vickers *et al.* 2002).

Case report

The subject was a 49-year-old post-menopausal woman who had a history of mixed urinary incontinence (stress urinary incontinence and urgency with urge leakage). Her urgency and associated increased frequency were the predominant problems; these are key symptoms of OAB. The patient has been undergoing treatment for 18 months, and had been treated conservatively with pelvic floor muscle exercises and

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Table 1. Acupuncture points and initial outcomes: (SP) Spleen; (B) bilateral; (KI) Kidney; (CV) Conception Vessel; (LI) Large Intestine; and (LV) Liver

Acupuncture point	Needle size (mm)	De qi	Adverse effects
SP9 (B)	25	Sharp/warm	None
SP6 (B)	25	Dull	None
KI3 (B)	25	Sharp	None
CV4	40	Dull	None
LI4 (B)	25	Sharp	None
LV3 (B)	25	Sharp	None

bladder retraining, incorporating advice on voiding habits and deferment techniques. Electrical stimulation was trialled earlier in this episode of treatment. Although this helped to improve the symptoms further, it failed to control them completely. The subject had also been on a prescribed course of anti-cholinergic medication (oxybutynin) for her symptoms of OAB, which had had good effects initially, but had recently become less effective. She is also occasionally 'troubled' by side effects of the medication. Urodynamic studies were been undertaken to confirm OAB, but the treatment approach would be the same even if this had been a confirmed diagnosis.

The patient suffered from fluctuating symptoms and, interestingly, was almost asymptomatic when on holiday. However, she was unable to gain the final element of control needed to resolve her symptoms fully. Therefore, the present authors discussed the use of acupuncture, which the subject consented to as an adjunct to her current conservative management. The use of anti-cholinergic medication was suspended for the duration of the acupuncture treatment to obtain an accurate assessment of the effects. In addition to her urinary symptoms, the subject also reported episodes of low-back pain (LBP). She was treated for this by a musculoskeletal physiotherapist at her local clinic. The back pain appeared to be mechanical in nature, and she performed a range of exercises to improve her 'core stability' and the range of movement in her lumbar spine. She still suffers from increased pain and stiffness in the lower back on rising, for which she has to take regular analgesia (paracetamol).

The use of acupuncture to treat OAB was explained to the patient. An information leaflet on the use of acupuncture in physiotherapy printed by the James Paget University Hospitals NHS Foundation Trust, Great Yarmouth, Norfolk, UK, was given to her. The possibilities of adverse effects were explained and contraindications/precautions were discussed. In accordance with Trust policy, a consent form was signed prior to the commencement of treatment. The points used and initial outcomes are shown in Table 1.

Once in place, the needles were stimulated until the subject experienced de qi, a characteristic feeling of numbness, soreness or slight pain that spreads around a correctly located acupuncture needle (Bergstrom *et al.* 2000). The needles were left in place for 20 min, as recommended by Bradnam (2007) in order to achieve central sympathetic effects, with manual stimulation applied by rotating the needles after 10 min. The patient reported feeling warm and became clammy after the insertion of Spleen (SP) 9 on her left side. She did not feel unwell and agreed to continue treatment with close monitoring. On extraction of the needle at this point, there was an initial 'grab' of the needle. The patient reported feeling increased sensitivity to the points on her left side. Interestingly, the predominant symptoms of her LBP originated from the left lumbar region.

On attending her next treatment session 5 days later, the subject reported improvements in her LBP, and found that she was requiring less of analgesia. She had not noticed any significant difference in her urinary symptoms. The same acupuncture points and treatment times were used. Once again, the sympathetic response of feeling warm and clammy occurred, but this was not bothersome to the patient. At the third treatment session, she reported good carry-over effects in that her LBP had remained fairly settled and that she continued to require less analgesia.

Over subsequent treatments, significant positive effects were noted in the symptoms of both LBP and OAB. On attending the sixth treatment session, the subject reported being asymptomatic with regard to her LBP and noticing improvements in her bladder symptoms in terms of reduced frequency. However, she was still experiencing an occasional strong urge to void.

Since the patient's LBP was asymptomatic, the use of the Large Intestine 4 and Liver 3 points were discontinued (these points had been used to specifically target LBP). The use of Bladder (BL) 28 was added. According to TCM, BL28 is thought to remove 'blockage' of qi and promote smooth urination. The relevance of its use from a Western acupuncture 'segmental' approach is described below. Bladder 28 requires the patient to be in a prone position, and therefore, the Conception Vessel (CV) 4 (lower abdomen) point was also discontinued. At her last review appointment (after a total of eight sessions of acupuncture), the subject reported no further episodes of OAB symptoms. The LBP remains asymptomatic and the patient has started a course of Pilates and 'aqua-cise'. A further review has been planned.

The outcome measured in the present case report is the subjective report of symptoms. Bladder diaries and quality-of-life questionnaires are used to measure outcome in the first author's (P.G.) clinical practice; however. neither were completed prior to the start of acupuncture treatment. This was because the acupuncture was offered during an episode of treatment and the case report was written retrospectively. An alternative outcome measure is urodynamic assessment. This costly and invasive procedure would confirm a diagnosis of OAB, but in order to assess the effect of treatment, it would need to be performed both prior to and on completion of acupuncture treatment. The present authors acknowledge that this would be helpful to objectively evaluate the effect of acupuncture in clinical trials.

Discussion

The bladder is under the control of the autonomic (sympathetic and parasympathetic) and central nervous systems. During bladder filling, the sympathetic predominates over the parasympathetic, causing an increase in urethral resistance and an inhibition of bladder contractions. The opposite happens during bladder emptying, causing a contraction of the bladder and a decrease of urethral resistance (Minni *et al.* 1990).

Behavioural therapy is often the key in resolving symptoms of urgency and increased frequency. Emmons & Otto (2005) acknowledged that behavioural therapy and physical therapy can be equally as effective as medication in controlling the symptoms of OAB initially, but argued that these results are short-lived. Pelvic floor muscle exercises are thought to help with the deferment process by utilizing the perineodetrusor inhibitory reflex. This reflex is activated by tension receptors in the striated muscle of the perineum and pelvic floor (Mahony *et al.* 1977). Therefore, performing a pelvic floor muscle contraction will have an inhibitory effect on involuntary bladder contractions. The stimulation of the bladder (detrusor) muscle that causes elimination occurs via the parasympathetic nervous system (via sacral nerves S2, S3 and S4). Muscarinic receptors mediate both normal and overactive bladder contractions. Mediation occurs by acetylcholine acting on these muscarinic receptors (Waldeck *et al.* 2002). Pharmacological treatment of OAB is designed to block the parasympathetic acetylcholine pathways, and abolish or reduce the intensity of bladder muscle contractions (Alhasso *et al.* 2006). The present authors suggest that it is reasonable to assume that the use of acupuncture, with its influence on the parasympathetic nervous system, would also have positive effects.

Sung & Jiaqi (2006) stated that acupuncture is likely to produce its effect through the nervous system, altering brain chemistry by changing the release of neurotransmitters and neuronhormones, thus affecting the parts of the central nervous system involved in the control of involuntary body functions. Acupuncture is commonly used in the management of urinary incontinence, where it is thought to control symptoms through inhibition of sensory afferent nerves of the bladder (Lee *et al.* 2004, cited by Sung & Jiaqi 2006). The autonomic nervous system innervates viscera, such as the cardiac muscle, visceral smooth muscle and glands (Cai 1992). The fibres of the sympathetic nervous system leave the central nervous system at the thoracic and lumbar regions, and the parasympathetic nervous system from the sacral portion of the spinal cord. The chemical transmitter in the parasympathetic nervous system between the postganglionic fibres and the effector cell is acetylcholine (Cai 1992).

The use of acupuncture to treat the symptoms of OAB can be approached in two ways. A segmental approach can be applied by needling points such as BL28 and BL30 (S2–S4), which will invoke a parasympathetic response at a spinal level. The alternative approach is to use acupuncture to influence all of the tissues supplied by the nerve at this level, which may have

Table 2. Acupuncture points and reasoning: (SP) Spleen; (KI) Kidney; (CV) Conception Vessel; (Ren) Ren Mai; (LI) Large Intestine; and (LV) Liver

Acupuncture point(s)	Reasoning
SP6	The spleen meridian is a yin meridian. Spleen 6 is indicated for disorders of the bladder and pelvis. It is also a cardinal gynaecological point. Spleen 6 is also known as the Sanyinjiao point, the crossing point of the three yin meridians, which helps to regulate qi in the liver, spleen and kidney, strengthening the kidney and bladder (Zhishun *et al.* 2002)
SP9	Again on the spleen yin meridian, this point is indicated for continence generally, and also dispels swelling and 'damp'. It was reasoned that using this point would boost the patient's qi, which is likely to be deficient in the postmenopausal woman
KI3	The kidney meridian is linked to the bladder and urinary output, with the coupled organ being the bladder. It is also thought to contribute to individual overall well-being, both physically and mentally. Kidney 3 was chosen specifically for its influence on the bladder in terms of treating urinary frequency and incontinence
CV4/Ren4	Indicated for frequency and urgency of micturition. Anatomically located in close proximity to the bladder. Used by Philp *et al.* (1988) in a study examining the effects of acupuncture in the treatment of bladder instability
LI4 and LV3	Used bilaterally as the 'four gates' to activate supraspinal analgesic effects (Bradnam 2007). The aim is to have a positive effect on the patient's low-back pain. Liver 3 is also thought to have an influence on the parasympathetic nervous system

Table 3. Alternative/additional points: (CV) Conception Vessel; (DU) Du Mai (Governing Vessel); (BL) Bladder; and (SP) Spleen

Acupuncture point(s)	Reference	Reasoning
CV6	Philp *et al.* (1988)	None given
DU4	Philp *et al.* (1988)	None given
BL39	Emmons & Otto (2005)	None given
BL23*/BL32/BL35	Philp *et al.* *Zhishun *et al.*	None given by Philp *et al.* (1988), but all three points used by Zhishun *et al.* (2002) to reinforce and regulate kidney qi
BL31/ BL32/BL33	Bergstrom *et al.* (2000) Honjo *et al.* (2000)	Used by Bergstrom *et al.* (2000) to achieve correspondence between acupuncture points and segmental innervation of the bladder. No justification is given by Honjo *et al.* (2000), but reference is made to the World Health Organization proposal for the standardization of acupuncture nomenclature
SP10	Minni *et al.* (1990)	None given
BL28	Emmons & Otto (2005) Philp *et al.* (1988)	None given, although the relevance of using this point has been described previously

a 'calming' influence on involuntary bladder contractions (Bradnam 2007).

The first author (P.G.) had limited access to the relevant literature at the start of the present episode of treatment. The acupuncture points used were based on teaching and information provided by an acknowledged expert. The reasoning for the use of these points is explained in Table 2. The points were chosen for their direct links with bladder function and their influence on qi. It is thought that the yin aspect of yin and yang is related to the parasympathetic nervous system, with yin being linked to the inner aspect of the body, feeding into the organs. Alternative/additional points have been suggested in the literature and are summarized in Table 3.

According to Chang (1988) and Zhishun *et al.* (2002), the therapeutic effects of acupuncture are

achieved through increases in maximum bladder capacity, suppression of the detrusor muscle activity, lowering of the maximum contraction pressure of the bladder and decreases in peak urinary flow rate. Minni *et al.* (1990) obtained positive clinical results in a group of children with enuresis in terms of considerable decreases in the number of uninhibited contractions of the bladder. Murray & Feneley (1982, cited by Minni *et al.* 1990) suggested that the therapeutic mechanism could be explained by a temporary parasympathetic action, followed by a durable sympathetic central action causing an increase in urethral resistance and inhibition of bladder contractions. This was supported by Honjo *et al.* (2002), who suggested that acupuncture suppresses bladder contraction via a mechanism of spinal segmental inhibition. Philp *et al.* (1988) found a symptomatic cure of OAB in 69% of their patients; however, few objective urodynamic changes were noted post-treatment. All the subjects who responded symptomatically reported lesser severity of urgency and better control during unstable contractions. The capacity of the bladder also improved, thus supporting the view that acupuncture exerts its effects at a sensory level. Not all patients considered themselves 'cured', but they reported that their symptoms of OAB were no longer a 'significant problem'; most were able to resume activities that they had previously been prevented from doing because of their urinary disability, thus improving their quality of life.

Not all patients will respond to acupuncture treatments. Two out of the five 'failures to treatment' documented by Philp *et al.* (1988) were known to be suffering from depression. Lewith & Kenyon (1984, cited by Philp *et al.* 1988) suggested that adverse psychological factors may well diminish the effectiveness of acupuncture. Nevertheless, it could be argued that acupuncture is often used to treat psychological disorders and that this may not always be the case.

There are flaws in many of the studies considered in the present case report. It is not possible to reproduce any of the studies, with the exception of that undertaken by Chang (1988). Other authors have clearly demonstrated which acupuncture points were used (as previously stated in Tables 2 and 3), but have failed to describe how the treatment was carried out in terms of positioning of the patient. For example, Emmons & Otto (2005) used acupuncture points SP6 (inner leg), BL39 (outer knee fold), BL28 (low back) and CV4 (lower abdomen). It would be interesting to know how the patient could have been comfortably positioned for 20 min of treatment if all points were needled at the same time.

There were considerable variations across the studies reported in the eight full-text articles reviewed for the present case report. For example, the sample sizes ranged from 15 to 80 individuals; the number of treatments ranged from a 'one off' session to twice weekly; the duration of treatment ranged from 4 weeks up to a maximum of 12 weeks; and treatment time varied from a minimum of 10 min to a maximum of 12 min.

Conclusion

Acupuncture offers satisfactory therapeutic effects in the short term and could represent a valuable alternative to more traditional treatment for OAB. Studies have shown that it is well tolerated with no side effects or complications in this client group, and that improvements are similar to those achieved by drug therapy, physiotherapy and behavioural therapy (Chang 1988; Honjo *et al.* 2000; Emmons & Otto 2005). All authors agree that further research is necessary to determine how to obtain the best clinical results from acupuncture for the treatment of OAB. In agreement with Vosloo (2007), the research questions which need to be specifically addressed are:

- Which acupuncture points should be used?
- How many treatments are required and how frequent should these be?
- If follow-up appointments are required, when are they needed to have maximum benefit?

Whilst it is useful to have some standardization in the approach to treatment, caution must be taken not to become 'prescriptive' in the use of acupuncture points, duration and frequency, for example. The use of acupuncture should be clinically reasoned in response to the each individual patient's needs.

Overall, the results from the research examined for the present case study show that acupuncture can provide positive therapeutic effects in the treatment of OAB. The subject has reported positive changes in her urinary symptoms, specifically a reduction in urinary frequency and strong sensations of urgency. It is expected that the patient will continue to improve based on these early results.

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