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Conservative chiropractic management of urinary incontinence using applied kinesiology: a retrospective case-series report

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Abstract

Objective: The purpose of this case series is to describe the chiropractic management of 21 patients with daily stress and occasional total urinary incontinence (UI).

Clinical Features: Twenty-one case files of patients 13 to 90 years of age with UI from a chiropractic clinic were reviewed. The patients had a 4-month to 49-year history of UI and associated muscle dysfunction and low back and/or pelvic pain. Eighteen wore an incontinence pad throughout the day and night at the time of their appointments because of unpredictable UI.

Intervention and Outcome: Patients were evaluated for muscle impairments in the lumbar spine, pelvis, and pelvic floor and low back and/or hip pain. Positive manual muscle test results of the pelvis, lumbar spine muscles, and pelvic floor muscles were the most common findings. Lumbosacral dysfunction was found in 13 of the cases with pain provocation tests (applied kinesiology sensorimotor challenge); in 8 cases, this sensorimotor challenge was absent. Chiropractic manipulative therapy and soft tissue treatment addressed the soft tissue and articular dysfunctions. Chiropractic manipulative therapy involved high-velocity, low-amplitude manipulation; Cox flexion distraction manipulation; and/or use of a percussion instrument for the treatment of myofascial trigger points. Urinary incontinence symptoms resolved in 10 patients, considerably improved in 7 cases, and slightly improved in 4 cases. Periodic follow-up examinations for the past 6 years, and no less than 2 years, indicate that for each participant in this case-series report, the improvements of UI remained stable.

Conclusion: The patients reported in this retrospective case series showed improvement in UI symptoms that persisted over time.

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Introduction

Urinary incontinence (UI) occurs when there is leakage of urine involuntarily, most commonly in older patients.[1] Fantl et al[2] state that incontinence affects 4 of 10 women and 1 of 10 men during their lifetime, and about 17% of children younger than 15 years. A large postpartum study of the prevalence of UI found that 45% of women experienced UI at 7 years postpartum. Thirty-one percent who were initially continent in the postpartum period became incontinent in the future.[3]

Continence depends primarily on the adequate function of 2 muscular systems—the urethral muscular support system and the sphincteric muscular network of the pelvic floor muscles (PFM).[4] These systems include the levator ani muscle, detrusor muscle, and pelvic floor muscles (coccygeus, obturator externus, obturator internus, gemellus inferior, gemellus superior, and levator ani), as well as the pudendal nerve that emerges from the sacral plexus. The striated muscles of the pelvic floor play an integral role in the closure of the lumen of the urethra and the maintenance of continence.[5] In women with stress UI, ineffective contraction or control of the pelvic floor muscles permits descent of the bladder neck with inadequate closure of the urethra, resulting in the leakage of urine.[6]

The comorbidities of lumbopelvic pain, incontinence, and breathing pattern disorders are slowly being elucidated.[7,8] Musculoskeletal impairments, and specifically muscular imbalances between agonist and antagonist muscles in the pelvis, create articular strain and soft tissue stresses that can lead to pain and UI.[9]

Current observations suggest that patients with stress incontinence may have imbalances in several lumbopelvic muscles that inhibit the PFM and lead to incontinence.[10] Recent data also indicate that breathing difficulties and incontinence are associated with increased chances for the development of low back pain,[11] demonstrating that the interactions between the lumbar and pelvic muscles and joints may be an important consideration in cases of UI.

A recent study assessed strength changes in the PFM using a perineometer (a pressure electromyograph that registers contractions of the PFM) after the application of chiropractic manipulative therapy (CMT). This investigation showed that phasic perineal contraction and basal perineal tonus, force, and pressure increased after CMT.[12] The duration of these force changes will have to be assessed in subsequent studies of this type.

It was Arnold Kegel[13] who first advocated pelvic floor muscle strengthening and retraining for stress incontinence, indicating his recognition of the importance of muscle inhibitions in cases of UI. Kegel's program of strengthening the inhibited muscles of the pelvic floor has shown some promise.[14-17] The potential usefulness of the applied kinesiology manual muscle test (AK MMT) approach in this model would be the identification of the inhibited muscles involved and the therapeutic approaches used to immediately address these inhibitions with CMT. A number of other reports have been made on the use of CMT for elderly patients with UI.[18] Stude et al[19] reported a case study of a 14-year-old female adolescent treated with CMT who recovered completely from traumatically induced UI. The applied kinesiology (AK) approach to a postappendectomy-induced case of UI has been described as well.[20] Chiropractic manipulative therapy has been shown to be effective in other reports on bladder control problems.[21-23]

Lumbar and sacral nerve root compression as the result of lumbar and sacral articular dysfunction and degeneration has been identified as a potential cause of *pelvic pain and organic dysfunction*, a term coined by Browning.[24,25] It is hypothesized that there may be a relationship between lumbar and pelvic muscles and UI.

The purpose of this case series is to report on the findings of chiropractic management of patients with UI. The patients included in this report presented for chiropractic treatment of either UI directly or another condition, with their UI being disclosed during the initial history taking at the beginning of treatment. Each patient signed informed, written consent forms to be examined and treated and to be included in this case-series report.

Clinical features

Assessment procedures

The testing of the voluntary skeletal muscles is based upon the procedures and principles of Kendall and Kendall, who described that a given muscle, when tested from a contracted position against increasing applied pressure from the examiner, could either maintain its position and be rated as "facilitated" or "strong," or break away and thus be graded as "inhibited" or "weak."[26] A recent review found the reliability of manual muscle testing (MMT) to be "good."[27] Clinical guidelines for the effective and reproducible use of MMT as used in this report have been previously described.[28]

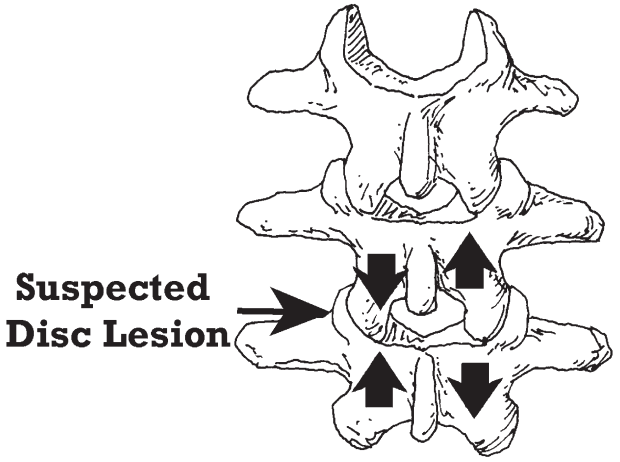

Fig 1. The AK lumbar disk challenge. The vertebrae above and below the possible intervertebral disc involvement are challenged by separating or compressing the spinous or transverse processes, then testing a strong indicator muscle for inhibition following the challenge. (Image used with the kind permission of David S. Walther, DC.)

The MMT in these patients' examination results that were normal was equivalent to 5 on the 5-point strength scale.[29] Muscles graded 4 or less were considered weakened, warranting interventions. Once a muscular dysfunction was identified by the MMT, postural, palpation, orthopedic, or other tests, it was necessary to define what type of dysfunction existed. The effect of this dysfunction upon attaching or remote muscles was suggested in these cases by procedures known in AK as "challenge" or "therapy localization." "Challenge" occurs when an external stimulus is applied and a change in muscle strength occurs as a result of the stimulus. Through this approach, therapies that are found to produce no improvements in muscle strength are rejected, whereas those eliciting a positive muscle response are pursued—thereby guiding treatments administered to the patient.[30-32] "Therapy localization" occurs when placing the patient's hand over an area of suspected involvement produces similar changes.[33,34]

Interventions

The first consultation, examination, and treatment for each of these patients lasted for 1 hour. Follow-up treatment sessions were required covering 1 to 13 treatments to reach maximum improvement for their UI, covering a period spanning 1 day to 6 weeks.

In 13 cases (1-6, 8-13, and 19), the result of the AK sensorimotor diagnostic challenge for lumbar disk involvement was positive. When the vertebra above the disk lesion was touched by therapy localization with one hand and the vertebra below with the other hand, therapy localization was positive in these cases. This means that it either strengthened the PFM or other involved muscles or weakened them if they tested initially strong.[33,35] This method of localizing disk involvement was added to the routine diagnosis of disk lesions and helped confirm the level of involvement.

An additional applied kinesiology diagnostic approach to disk involvement was the 2-handed "AK challenge" of the vertebrae above and below the disk lesion.[33,35] The spinous or transverse processes were used as levers, and a separating or compressing force was applied between the 2 vertebrae (Fig 1). The muscles usually tested with this challenge were the hamstrings if they were initially strong in the particular case under examination. In all 21 patients, this particular sensorimotor challenge was performed; however, the challenge procedure—which guided the use of subsequent Cox flexion distraction decompression treatment—only influenced the function of the involved muscle inhibitions in 13 of the cases. The CMT used for the category III and lumbar disk challenges that were present was the flexion distraction decompression adjustment method. After the Cox flexion distraction decompression treatment of these 13 cases, the positive indicator of a disk lesion using the AK method became negative; and the UI improved in all cases (Fig 2).

Depending on the findings during AK examination, the CMT involved high-velocity, low-amplitude adjustments; Cox flexion distraction manipulation[36]; and/or use of a percussion instrument for the treatment of myofascial trigger points (MTrPs). Treatment of the MTrPs found in the patient's PFM was made with a percussor instrument (manufactured by IMPAC, Inc., Salem, OR).

Fig 2. AK challenge to the lumbosacral spine produced weakness in a previously strong indicator muscle (the category III challenge procedure). Flexion distraction decompressive treatment corrected the AK sensorimotor challenge to the lumbosacral spine.

Table 1 Summary of patient characteristics, symptoms, and treatment results

UI case	1	2	3	4	5	6	7	8	9	10	11	12	13	14	15	16	17	18	19	20	21
Age (y)	63	26	54	90	64	49	60	55	60	87	67	62	74	64	79	62	64	79	88	74	13
Low back pain	X		X	X	X		X	X	X	X	X	X	X	X	X		X		X	X	X
Leg pain							X			X	X	X	X				X		X	X	
Other symptom	Rectal pain	ADHD	Pain with coitus	Shoulder pain	Knee pain			Neck pain		Foot pain		Rectal pain	Excessive flatus			Anxiety, pain w/ intercourse		Neck pain	Postpolio	Depression	
Surgical history	Hyster														Hyster		Bladder, hyster	Hyster	Lamin		Appendectomy
Pelvic pain	X	X	X	X		X	X	X	X	X	X	X	X	X	X	X		X	X	X	X
Length of UI symptoms	2.5 y	3 mo	5 y	13 y	9 mo	4 mo	1 y	10 y	13 y	5 y	18 mo	1.5 y	4 y	5 y	18 mo	7 y	15 y	49 y	37 y	40 y	10 mo
No. of treatments: length of time to reach maximum improvement	6: 2 wk	2: 1 wk	7: 2 wk	3: 2 wk	2: 1 wk	4: 2 wk	3: 2 wk	7: 3 wk	8: 4 wk	9: 4 wk	3: 1 wk	5: 2 wk	9: 4 wk	4: 2 wk	7: 4 wk	4: 2 wk	10: 5 wk	12: 12 wk	7: 3 wk	15: 13 wk	2: 1 wk
UI after treatment	R	R	R	R	R	R	R	IC	IC	IS	IC	R	IC	R	IC	IC	IS	IS	IC	IC	R

All 21 patients are female. *X*, Presence of symptom; *ADHD*, attention-deficit/hyperactivity disorder; *Hyster*, hysterectomy; *Lamin*, laminectomy; *IS*, improved slightly (patient reported that UI was still frequent, although both the quantity or urine voided and the frequency of the UI had decreased); *IC*, improved considerably (patient reported that there was no need for continuing use of an incontinence pad and that UI was now very infrequent); *R*, resolution of UI symptoms (patient reported that there was no need for continuing use of an incontinence pad and that UI was no longer present).

Table 2 MMT findings present in the 21 patients with UI

Finding	No. of cases
Inhibition of left, right, or bilateral gluteus maximus	17
Inhibition of left, right, or bilateral hamstring	16
Inhibition of pelvic floor muscles	14
Inhibition of diaphragm	11
Inhibition of left, right, or bilateral psoas	11
Inhibition of left, right, or bilateral rectus abdominus	10
Inhibition of left, right, or bilateral gluteus medius	9
Inhibition of left, right, or bilateral piriformis	7
Inhibition of left, right, or bilateral rectus femoris	6

Outcomes

Table 1 presents the varied low back and pelvic symptomatology in 21 patients with UI in whom evidence of pelvic floor muscular imbalances had been identified. Symptomatology as reported by the patients is presented before and following maximum improvement after treatment. One to 13 treatment sessions (spanning 1 day to 6 weeks) were required to bring the patients involved in this case series to maximum improvement.

Table 1 also summarizes the number of treatments and the length of time required for this group of patients to achieve maximum improvement. The maximum symptomatic improvement coincided with the maximum improvements in the muscular inhibitions originally found on MMT.

Each of the patients in this retrospective case-series report remains under chiropractic care at our clinic. The improvements (or lack of improvements) in UI have been maintained in each of these cases for 2 to 6 years, at which time the retrospective chart review was performed. The MMT findings for the cases are presented in Table 2.

In 8 cases (7, 14-18, and 20-21), there was no disk involvement indicated; and yet UI was present—suggesting that lower sacral nerve root dysfunction was not the only etiological cause of UI and PFM inhibitions. In these cases, the treatment of the muscle inhibitions present involved 3 approaches: (*a*) CMT for the pelvis, (*b*) remote treatment to articulations that innervate the tissues involved (the upper cervical spine and the gluteus maximus muscle for example), and (*c*) percussion to involved MTrPs in the PFM.

Breathing pattern disorders involving the diaphragm muscle were involved in 10 cases (1-4, 8, 11, 13, 16, 19, and 21).

In 13 cases (1-5, 7-8, 10-14, and 17), scars from pregnancy, cesarian deliveries, and one appendectomy were present. Diastasis rectus abdominus was present in 3 of the 13 cases with scars from pregnancy. Gentle pincer palpation of the particular scar and stretching the underlying muscle produced weakening of the same muscle on MMT. AK mechanical treatment to the scar (using a percussion device) abolished the pincer palpation finding to the scars and the MMT weakness in the underlying muscle.[33,34,37]

In 11 cases (1-2, 3, 7, 9-13, and 15-16), there was a positive finding of pincer palpation to the PFM. Treatment of the MTrPs found in the patient's PFM was made with a percussor instrument. After 2 minutes

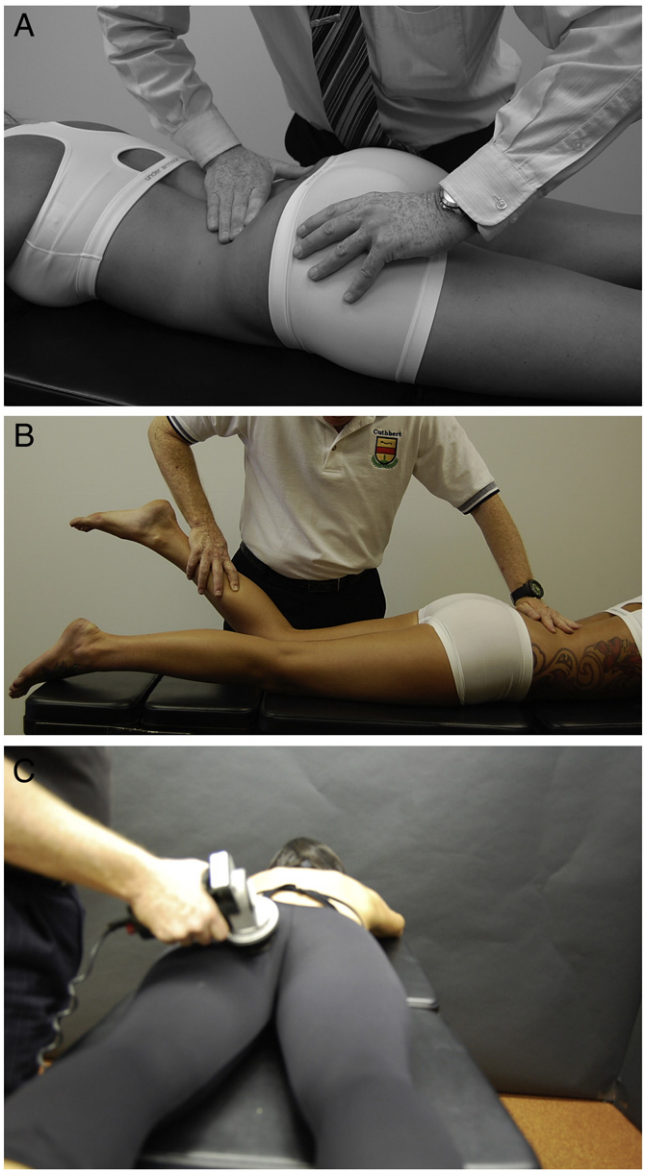

Fig 3. Pincer palpation of the PFM (A) produced weakening of the previously strong hamstrings. Percussion (B) on the PFM (C) corrected this finding and reduced palpation tenderness and referred pain from the MTrPs present in the PFM.

of percussion upon the MTrPs found in the PFM, the result of the AK "pincer palpation" test became negative; and pressure on the MTrPs that previously produced either referred pain or muscle inhibitions in previously strong indicator muscles no longer occurred[37] (Fig 3).

In 6 cases (1, 13, 15, 17-19, and 21), there had been previous spinal (1), abdominal (1), or pelvic organ (4) surgeries; in 1 of these cases (1), there was a resolution of the UI condition; in 3 cases (13, 15, 19), there was considerable improvement; and in 2 of these cases, (17-18), there was only slight improvement.

The diagnoses of muscular inhibitions related to articular and soft tissue disorders of the pelvis and lumbar spine and their treatment using CMT were effective in attaining the resolution (n = 10), considerable improvement (n = 7), or slight improvement (n = 4) of daily stress and occasional total UI in these cases. These burdens remained corrected as seen by yearly follow-up examinations for the past 2 to 6 years. Improvement in patients with long-standing UI occurred in 10 cases (8-10, 13-14, and 16-20); 2 of these patients (cases 18 and 20) had UI present for 49 and 40 years, respectively. Periodic follow-up examinations for the past 6 years, and no less than 2 years, indicate that for each participant in this case-series report, the improvements of UI remained stable.

Discussion

This review of 21 cases of UI has suggested that there may be a relationship between MMT of the pelvic and lumbar spinal muscles (particularly the PFM), as this seemed to be consistent in each of the selected cases.

The following is a discussion of some of the theories that may explain this relationship. The PFM run from the pubic symphysis to the ischial spines bilaterally. These muscles and fascia continue superiorly, with the myofascia surrounding the pelvic organs and ligaments of the pelvic joints. The PFM are also continuous with the abdominal muscles and play a role in urological function.[38,39] The PFM are linked to the hips and obturator internus muscles; and thus, it is likely that the functional PFM extend from greater trochanter to greater trochanter.[40,41] If the PFM are hypotonic (as they were in 14 cases of this report), the bladder and other pelvic organs may tend toward prolapse and descend toward their orifices.

Scars from pregnancy, cesarian deliveries, and one appendectomy may possibly disturb the respiratory mechanics of the oblique abdominal and diaphragm muscles, resulting in physical discomfort and incontinence. As well, presence of incontinence may cause emotional stress. The use of incontinence pads may also increase anxiety,[42] producing breathing pattern disorders that may further disturb diaphragm muscle function. Breathing pattern disorders are vulnerable to emotional distress, muscle imbalances, and pain.[43]

The patients in this study showed breathing pattern disorders that may have been associated with weakness in the rectus abdominus (cases 10-14 and 17) or diaphragm muscles (cases 1-4, 8, and 11) during MMT examination (except for cases 5 and 7 who had abdominal scars but no MMT weakness in these 2 muscles). These factors may have combined to affect the diaphragm muscle's function, which has been connected to the function of the pelvic floor, bladder, and urethra.[4-6]

Soft tissue treatment of these scars was done using a percussor instrument. It is thought that the immediate effect of percussion modifies the physical nature of the myofascial matrix.[44] Percussion may also press fluid from the nuclear bag of the muscle spindle cells (part of the MTrPs pathophysiology), reducing the tension in the capsule of the spindles.[45]

There is also a theory that the PFM group should co-contract with the rectus abdominus muscle.[46] The examination findings in this report showed that where the rectus abdominus (10 cases) or PFM (14 cases) were inhibited, one member of this force couple may have disturbed the other when dysfunctional.

Travell and Simons[47] state that "weakness is generally characteristic of muscles with active MTrPs." This weakness may also be present in cases of incontinence in the urethral and sphincteric muscular support systems (including the levator ani, detrusor, and pelvic floor muscles) of the lower pelvis.[3,4,39] A positive response to pincer palpation of the PFM was present in 11 of the cases (1-2, 3, 7, 9-13, and 15-16), indicating the possibility that MTrPs played some role in the PFM inhibitions found. Pelvic floor muscle imbalances have been noted by some researchers to be frequently associated with sacroiliac dysfunction.[48]

Kobesova et al[49] suggest that scars may develop adhesive properties that disturb tissue tension, alter proprioceptive input, and create functional changes similar to active MTrPs. Moncayo and Moncayo[50] have recently demonstrated the usefulness of the AK treatment of scars upon muscular function.

Scars from previous surgeries may form connective tissue MTrPs.[51] The theory of active MTrPs in the abdominal muscles beneath the scars was investigated using the AK methods of pincer palpation and the

muscle stretch reaction.[33,34,37] Both of these tests identified the presence of active MTrPs in the patients of this report. Travell and Simons[47] describe the method of diagnosis and treatment of MTrPs (called *pincer palpation and percussion*) used in this report.

The aforementioned observations of Kobesova et al,[49] Moncayo and Moncayo,[50] and Travell and Simons[51] may relate to the findings of Arnold Kegel, who first advocated pelvic floor muscle strengthening and retraining for stress incontinence.[47] It should be observed that in cases like these where muscle inhibition of the PFM played some role in the UI, Sherrington's[52] law of reciprocal innervation ("when one muscle contracts, it's direct antagonist relaxes to an equal extent") suggests that some of the PFM—antagonists to the inhibited PFM—may already be hypertonic. Therefore, toning exercises for the PFM may be counterproductive.

The AK MMT is theorized to have identified the inhibited PFM or the inhibited muscles related to the PFM anatomically or functionally. The AK sensorimotor challenge then rapidly diagnosed the manipulable articulation or soft tissue producing this inhibition. During the examination, this sensorimotor challenge produced an immediate strengthening of the PFM or muscle(s) related to the pelvic floor. Treatment to the articulation or soft tissue (guided by the AK sensorimotor challenge) led to the immediate—and in 10 cases long-lasting—strengthening of the PFM or muscle related to the pelvic floor anatomically or functionally. From these considerations, there may be reason to suspect that the patterns of muscle weakness associated with UI and disclosed by MMT methods may be of clinical utility in guiding CMT.

Limitations

Caution must be used in the interpretation of the results of this study, in that as a retrospective case series it was never designed to show cause and effect. This study points out common features from individual patients that lend themselves to generating hypotheses for testing, applying future research designs.

With this investigation having been limited to women, any generalization of our results is limited to that sex. With the study being retrospective in nature, there exists selection bias. As well, it is possible that the patients' symptoms may have resolved during the normal course of the disorder and, therefore, the resolution may not necessarily be attributable to the treatment. This present study did not use standard outcome measures. Validated UI outcome measures and pain scales rather than the general descriptions provided here need to be included in future research. The same is true for measuring the actual quantities of urine passed involuntarily. Finally, prospective experimental studies involving UI, CMT, and AK should be conducted to evaluate if a given intervention is intended to be shown as a clinically effective treatment.

Conclusion

This report discussed a chiropractic treatment approach and the resolution, considerable improvement, or slight improvement of UI in 21 cases. Further research with defined inclusion criteria and validated outcome measures is needed to evaluate the effectiveness of CMT and AK procedures in managing UI.

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Dr Cuthbert is on the Board of Directors of the International College of Applied Kinesiology. Dr Rosner receives a consulting fee and support for travel to meetings and is the Research Director of the International College of Applied Kinesiology–USA.

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