Behavioral Assessments and Treatments for Many Pelvic Floor Problems Are Effective and Simple to Perform

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Behavioral assessments and interventions for such common pelvic floor problems as stress and urge urinary incontinence, muscle-related constipation, fecal incontinence, overactive bladder syndrome (OAB), urinary retention, and tension-related pelvic pain are simple to provide and have high levels of effectiveness. Reimbursement is rapidly improving for these behavioral interventions.

Introduction

Pelvic floor disorders are common clinical problems that cause considerable disruptions in the lives of sufferers and can effectively be treated using behavioral interventions. The public and medical communities alike are rarely aware of the dimensions of the problem because urinary and fecal incontinence as well as other pelvic floor disorders are among those problems people do not discuss openly with their providers. Our studies of young women with urinary incontinence (UI) have shown that nearly none report it to physicians (Sherman, Davis, & Wong, 1997). For fecal incontinence, studies show that only 36% had consulted a doctor about the problem and that 10% avoided leaving the house because of it (Laycock & Haslam, 2002).

UI becomes common in middle age and reaches epidemic proportions by old age, with 30%–60% of the nursing home population having UI. For example, the prevalence of UI is about 38% of people >60 years living in the community and about 33% of female soldiers (Davis et al., 1998). Overall, about 5% of men and 14% of women report being incontinent at least once per month. About half of those with UI also have fecal incontinence (Laycock & Haslam, 2002). Costs are estimated to be about $16 billion/year.

A random survey of 6,959 Americans showed that overall 2.2% of the population has some fecal incontinence. Surprisingly, two thirds of these individuals were <65 years of age, and 63% were women. Let us consider the population >65 years. Of those living at home, 3.7% are fecally incontinent at least once per week and 6% need to wear pads because of fecal incontinence. Twenty-one percent of those living in nursing homes had fecal incontinence (Laycock & Haslam, 2002). There are few population-based studies on pelvic pain, so the picture is not as clear. One study of 5,263 women between the ages of 18 and 50 indicated a 15% rate of pelvic pain not related to the menstrual cycle (Laycock & Haslam, 2002).

Biofeedback Treatment of Pelvic Floor Disorders

Many of the pelvic floor disorders that plague humanity are caused by inappropriate motor recruitment patterns and/or hypertonus in the pelvic floor muscles and surrounding tissues. For example, stress and urge UI are usually caused by a combination of weak or inappropriately tense, unstable muscles and their possessors' inability to recognize these inappropriate levels and patterns of tension. Psychophysiological recordings via surface electromyography (EMG) can monitor and display elevated muscle tension levels along with faulty motor recruitment patterns. Thus, inappropriate motor activity is readily demonstrated to patients and health care providers alike.

Biofeedback is an ideal method for showing patients inappropriate motor patterns in real time, thus facilitating correction. After the patient has been properly educated regarding bowel or bladder function or pain mechanisms, the direct and obvious relationship between the muscle tension patterns seen on a biofeedback display and the presenting symptoms can be understood by patients without any leap of faith. Therefore, the assessments and treatments have a high degree of credibility.

The common types of voiding disorders treated with biofeedback-assisted behavioral interventions include overactive bladder syndrome (OAB) with or without urge UI, urinary retention due to bladder sphincter dyssynergia, stress UI, and mixed incontinence (stress and urge combined). Patients are categorized as having stress incontinence if they experience an involuntary loss of urine with increased intra-abdominal pressure such as coughing, sneezing, or laughing. Patients with stress incontinence demonstrate a neurologically normal bladder upon urodynamic testing, but weak pelvic floor muscles upon physical examination.

OAB is characterized by urgency with or without urge incontinence, and usually with frequency and nocturia. Urge incontinence is defined as involuntary leakage accompanied by or immediately preceded by urgency. Patients with urge incontinence demonstrate detrusor overactivity upon urodynamic testing. Detrusor overactivity is the inability to indirectly control the detrusor muscle, a smooth muscle of the bladder. The normal functions of the detrusor are to alert a person to bladder filling with slight spasms and to initiate and maintain urination with a strong contraction. Those patients with symptoms of both stress and urge incontinence are defined as having mixed UI. They demonstrate both detrusor overactivity upon urodynamic testing and pelvic floor muscle weakness upon physical examination. Urinary retention leading to overflow incontinence is involuntary leakage related to a noncontracting detrusor muscle (detrusor areflexia) or urethral obstruction and is typically not treated using standard behavioral interventions unless the obstruction is related to a nonrelaxing pelvic floor (bladder sphincter dyssynergia).

Specific patterns of abnormal muscle activity (pelvic floor dyssynergia, nonrelaxing puborectalis muscle, anismus) have also been clearly shown to cause muscle-related constipation. Severe constipation is a leading cause of fecal incontinence in both the young and elderly (overflow fecal incontinence; Tries & Eisman, 2003a). Fecal incontinence is also the result of weak pelvic floor musculature.

The literature indicates that behavioral interventions for bowel and bladder disorders have an overall high success rate with reasonable levels of maintenance over the years (Tries & Eisman, 2003a, 2003b, 2003c). Biofeedback-based interventions have been shown to rectify the underlying physiological problems causing the incontinence (Davis et al., 1998). Psychophysiologically based approaches have been shown to be efficacious interventions for stress and urge types of UI and muscle tension–related fecal incontinence. There is also considerable, if variable, evidence supporting their efficacy for the other disorders noted in this article.

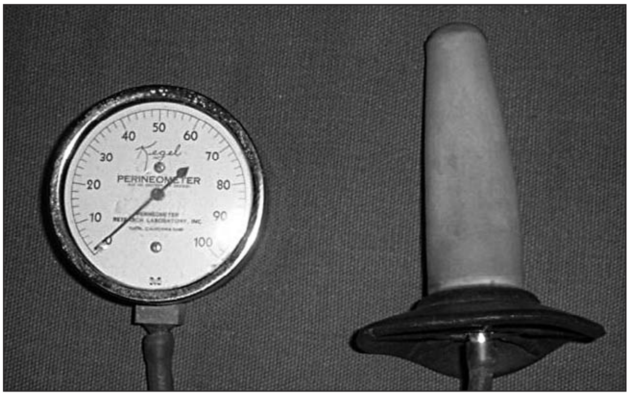

Figure 1. The Kegel perineometer with a vaginal sensor.

Historical Development of Biofeedback for Pelvic Floor Muscle Dysfunction

Arnold Kegel, MD, was one of the originators of biofeedback. He recognized that many women were incontinent because their pelvic floor muscles were weak and they had little control over them. By 1948 he had published his experience using a pneumatic (air pressure balloon) sensor inserted into the vaginal canal connected by a tube to the air pressure gauge of a sphygmomanometer (Figure 1). His patients could tell how effective and strong their squeezing was by watching how high the needle went on the gauge. He combined biofeedback in the office with exercises done at home using the pneumatic biofeedback device. Unfortunately, the biofeedback part of the treatment disappeared as health professionals began to recommend that women do "Kegels" without using the biofeedback component of Kegel's exercise program. As far as we know, Kegel's method of training did not include teaching patients to isolate pelvic floor muscle contractions.

In 1975, John D. Perry (2005) developed a self-inserted vaginal EMG probe for recording surface muscle tension from the vaginal canal, and by 1981 he had developed a commercial version. This device and the protocols he concurrently developed led to the monitoring and treatment methods currently in wide use. Current methods using two channels of surface EMG biofeedback often aim to teach patients how to produce isolated pelvic floor muscle contractions. This is done by simultaneously monitoring surface EMG (SEMG) activity from the pelvic floor (vaginal, rectal, or perianal placement) along with another SEMG channel placed on the abdominal obliques or rectus abdominals while the patient tries to contract only the pelvic floor muscles.

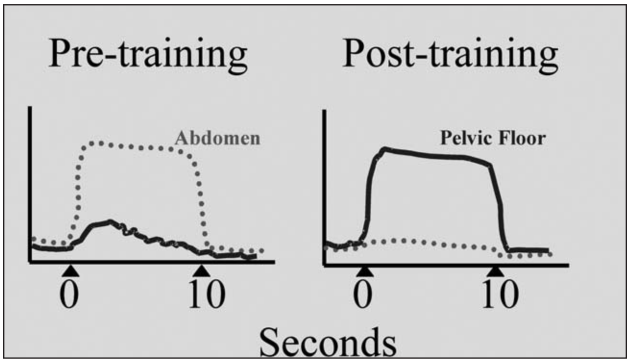

Figure 2. Change in pelvic and abdominal surface electromyography (SEMG) tensing patterns from pre- to posttraining. Lower abdominal muscle tension (recorded using SEMG sensors) is shown as a dashed line, whereas pelvic floor muscle tension (recorded from a vaginal sensor) is shown as a solid line.

Typical Assessment Protocol

The initial SEMG pelvic floor muscle assessment is crucial for subsequent treatment planning. Typically, sensors are mounted on both the pelvic floor (using a self-inserted vaginal sensor) and abdominal muscles (using SEMG sensors). Patients are asked to contract their pelvic floor muscles while keeping their abdominal muscles relaxed. During a standard SEMG pelvic floor muscle assessment the patient is asked to progress through a series of motor activities: prebaseline (rest), a series of phasic quick contractions (five to six), a series of tonic 10-second contractions (five to six), and postbaseline (rest). Additionally, tests for endurance and muscle coordination (synergy) are often performed at evaluation. Patients with pelvic floor muscle dysfunction often demonstrate poor motor control of their pelvic floor muscles as indicated by delayed and/or weak motor recruitment, abdominal substitution, muscle instability, and/or quick fatigue. Treatment is essentially aimed at teaching patients to correct the problems observed during the evaluation. Figure 2 illustrates a typical pattern of pelvic floor and abdominal tension levels seen before and after biofeedback training.

Treatment Protocol

Biofeedback-assisted training programs are tailored to the individual based on the initial SEMG pelvic floor muscle assessment. A typical protocol might consist of a 5- or 10-second contraction followed by 5 seconds of relaxation repeated five times within each trial, with a 30-second break between each of the five trials. Often a shorter contraction period (5 seconds) is used because of pelvic floor muscle weakness and fatigue. Patients are told to contract the pelvic floor muscle while trying to keep the abdominal, gluteal, and thigh muscles relaxed. The EMG signals of both the pelvic floor muscles and the abdominal muscles are displayed on the computer screen. Patients are instructed to keep the abdominal muscle signal at baseline by relaxing the abdominal muscles while raising the pelvic floor signal by contracting the pelvic floor muscles. They are asked to maintain the contraction for the entire 5 or 10 seconds and then to relax all muscles so that both of the lines return to baseline. The pelvic floor muscles need to react quickly, maintain consistent tension for 10 seconds, and then relax quickly.

Patients are also asked to practice Kegels while looking away from the computer screen to ensure that they are associating the sensations with correct tension patterns. This also ensures that they can recreate the correct patterns during practice sessions at home by being aware of the sensations experienced in the clinic when correct patterns are produced. The objective is to teach patients to calibrate their sensations to actual levels of tension as seen on the biofeedback display. Patients are also taught to perform "quick flicks" in which the pelvic floor muscles are contracted for 1 second and then returned to baseline. At our clinic we ask patients to repeat this tense-relax exercise five times during the first session. The number of trials of both exercises (phasic and tonic) is increased by five at each session until subjects are performing 25 trials of each at their final biofeedback session. Contract/relax exercise cycles are performed lying down, sitting, standing, and finally while performing activities such as stooping and lifting. Quick flick training is also used for management of OAB.

Daily home practice of Kegel exercises is an integral part of the treatment. They are used to help patients increase muscle bulk and strength so they can successfully apply their emerging control and awareness skills. Practice sessions usually begin at 10 minutes but may be shorter if muscle fatigue occurs. Practice consists of cycles of 10 seconds of tensing followed by 10 seconds of relaxing. These cycles are interspersed with quick-flick practice in which the pelvic floor is tensed for 1 second and then relaxed.

Conclusion

Behavioral interventions along with biofeedback-assisted pelvic floor muscle rehabilitation for elimination disorders and pelvic pain syndromes can be simple to apply. However, there is a steep learning curve for mastering relevant physiological information, normal and abnormal smooth and striated muscle functioning, bowel and bladder habits, the modality of SEMG and other effective applied psychophysiology interventions. Also, the clinician needs to have a certain degree of comfort with discussing sensitive and private aspects of a patient's daily activities. Getting the required knowledge base and reaching a level of ease requires specialized didactic training in behavioral interventions for pelvic floor disorders and mentoring with an experienced clinician who delivers these specialized services.

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