

SPECIAL ISSUE

Biofeedback for Pelvic Muscle Dysfunction

Debbie Callif, OT, BCB-PMD

Continence & Pelvic Wellness Clinic, Mequon, WI

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Biofeedback for pelvic floor muscle dysfunction provides a practical and effective intervention for elimination disorders. Dysfunction in the pelvic floor muscles can affect bladder and bowel function and can cause pelvic pain. According to the National Association of Continence, there are 25 million Americans affected by bladder or bowel incontinence. Surface electromyographic (sEMG) sensors monitor the electrical activity of the pelvic floor muscles. Additional muscle co-contractions of the obturator internus, hip adductors, and transverse abdominis can facilitate improvements in symptoms affected by pelvic floor dysfunction. Pelvic floor therapy incorporates urge reduction techniques and functional control strategies. Dietary and lifestyle recommendations are also provided. The Biofeedback Certification International Alliance (BCIA) is the primary certifying body in the fields of biofeedback and neurofeedback. BCIA has a Blueprint of Knowledge specific for certification in pelvic muscle dysfunction biofeedback (PMDB). The Blueprint outlines the fundamental science, history, and theory of sEMG biofeedback as used for elimination disorders and chronic pelvic pain. You can find more information on PMDB at www.bcia.org.

Introduction

Biofeedback for pelvic muscle dysfunction provides a practical and effective intervention for elimination disorders. This is one of the best documented biofeedback interventions, with an extensive body of research showing positive outcomes (Yucha & Montgomery, 2008). According to the National Association for Continence (n.d.), there are 25 million Americans affected by bladder or bowel incontinence. It has been reported that more than half of all women and 25% of all men deal with various forms of incontinence (Gorina, Firoozi, & Griebeling, 2014). Only 45% of women will seek help despite high success rates with treatment. Another source reported that the cost of urinary incontinence care in 2000 was \$19.5 billion (Hu et al., 2004). The more you search for these statistics, the more you will see that the numbers vary depending on the source you read; however, one thing is common: Inconti-

nence is on the rise. There are many causes, including childbirth, lifestyle, other medical conditions, and even injuries.

Another related disorder treated by some using biofeedback is pelvic pain. Statistics on pelvic pain are much harder to find.

What Are the Pelvic Floor Muscles?

The pelvic floor is a group of muscles that is often called the “floor of the pelvis,” as they are situated at the bottom of the pelvis. The pelvic floor muscle is called the levator ani. The levator ani muscle is made up of three components: pubococcygeus, puborectalis, and iliococcygeus. When there is dysfunction in these muscles, it can affect bladder and bowel function and cause pelvic pain.

Medical Conditions Based on Pelvic Floor Dysfunction

Conditions affected by pelvic floor muscle dysfunction include urinary incontinence, urinary frequency and urgency, and interstitial cystitis/painful bladder syndrome. Bowel dysfunction can include incontinence, frequency, urgency, constipation, and irritable bowel syndrome. Pelvic pain may encompass genital pain, vulvodynia, and prostatitis to name a few. Men, women, and children can be helped by pelvic floor biofeedback.

What Is Pelvic Floor Biofeedback?

Pelvic floor biofeedback uses surface electromyographic (sEMG) sensors either inserted vaginally or rectally or placed around the anus to monitor the electrical activity of the pelvic floor muscles. The biofeedback protocol frequently used includes evaluating resting levels, phasic muscle fibers, tonic muscle fibers,¹ and the endurance of the pelvic floor muscles. The phasic component of the assessment includes quick contractions with six repetitions.

¹ Thirty percent of the muscle fibers in the pelvic floor are fast-twitch fibers, which means that these muscles are powerful but will fatigue relatively soon. Seventy percent of the fibers in the levator ani muscle are tonic fibers and, in contrast, are slow twitch, so that they fatigue more slowly and are functionally supportive of endurance.

During the tonic portion of the evaluation, the patient performs 10-second contractions immediately followed by 10-second rest periods. These are repeated six times. The endurance phase is 60 seconds in duration.

In the past, biofeedback therapists often trained patients to keep the abdominal muscle quiet during pelvic floor muscle training; this is no longer the case. New research shows that training patients to co-contract the transverse abdominis muscle and the pelvic floor muscles has a therapeutic effect for stress urinary incontinence (Tajiri, Huo, & Maruyama, 2014).

Initially, patients are assessed in different positions: sitting, standing, and lying down. Pelvic floor muscle rehabilitation includes up-training, down-training, and endurance. Up-training means that a specific muscle or muscles are trained toward increased contractual activity. Down-training means that a specific muscle or muscles are trained toward decreased contractual activity. Endurance involves training a muscle to sustain a contraction longer. Often restoring better pelvic floor function requires up-training one muscle group or groups while simultaneously down-training a second muscle group or groups.

Therapy may also incorporate the coordination of pelvic floor muscles with the respiratory diaphragm. Dysfunctional breathing patterns can contribute to pelvic floor muscle dysfunction. In healthy individuals, as the breathing diaphragm descends, the pelvic floor muscles lower slightly. The pelvic floor muscles also work in conjunction with the obturator internus, hip adductors, and transverse abdominis (Fitzgerald & Kotarinos, 2003). These muscles need to work in conjunction with each other for bowel and bladder control and reduced pelvic pain. For example, the pelvic floor muscles attach to the obturator internus muscle via a tendon. This tendon is continuous with the obturator internus fascia. Activation of the obturator internus muscles helps to facilitate increased strength in the pelvic floor muscles and improved symptoms. As a patient progresses, functional mobility will be incorporated. This may include teaching a patient who becomes incontinent of urine while getting out of bed to activate the pelvic floor muscles prior to this activity. This will help to stop the flow of urine before the patient even begins to roll over in bed.

Pelvic floor therapy incorporates urge reduction and functional control strategies. Dietary and lifestyle recommendations are also provided. In the case of urinary frequency and urgency, it is important to assess whether your patient is consuming bladder irritants such as caffeine and “bubbles” in soda. Several experts also have reported that biofeedback is helpful in teaching physiological

quieting techniques (Glombiewski, Bernardy, & Häuser, 2013; Lemaire, Wallace, Lewin, Grood, & Schaefer, 2011).

It is difficult to know the length of the pelvic floor muscles without manually evaluating them. Muscles in a shortened position need to be functionally lengthened prior to them being strengthened. It is important to refer a patient to a provider who is knowledgeable in proper assessment of the pelvic floor muscles, if you are not qualified to do so. You can find a qualified pelvic floor occupational or physical therapist at www.pelvicpain.org.

Skills, Competencies, and Certification for Pelvic Floor Practitioners

The Biofeedback Certification International Alliance (BCIA) is the primary certifying body in the fields of biofeedback and neurofeedback. Urinary and fecal incontinence and chronic pelvic pain syndromes are typically medical diagnoses. That is why the BCIA has elected to certify only licensed health care professionals from the fields of medicine, physical and occupational therapy, and nursing. Licensed assistants in physical and occupational therapy may also be certified as technicians. All BCIA certificants are required to (a) work within their legal scope of practice, (b) abide by all licensing laws that regulate the treatment of diagnosed disorders, and (c) remain within their area of expertise and competence.

BCIA Certification and Why It Must Be the Gold Standard

BCIA has a Blueprint of Knowledge specific for certification in pelvic muscle dysfunction biofeedback (PMDB), which outlines the fundamental science, history, and theory of sEMG biofeedback as used for elimination disorders and chronic pelvic pain. No state license requires training in biofeedback, and no university programs in those health care fields list biofeedback as part of the standard curricula. That is what makes BCIA certification even more important.

What Market Potential or Consumer Demand Is There for New Practitioners Getting Training and Coming Into This Field?

There is a strong demand for new practitioners getting training in pelvic muscle floor disorders. As stated earlier, the National Association for Continence reported that more than 25 million people in North America experience incontinence. The U.S. Department of Health and Human Services (n.d.) has reported that as of 2013, 44.7 million Americans were 65 years or older; this is the age at which

the rates of incontinence increase dramatically. Americans are living longer now, and members of the Baby Boomer generation generally want to remain more active and more independent. As a whole, patients are looking for new answers, nondrug treatments that will provide good results and not Band-Aids to mask the symptom. Millions of dollars are spent each year advertising for adult diapers or other stay-dry products. Because of the efficacy of this pelvic floor biofeedback modality, more seniors are becoming aware of biofeedback and other nondrug options.

Evidence also shows there are more people experiencing incontinence due to sports and issues related to trauma. A Veterans Affairs (VA)-based study reported findings that posttraumatic stress disorder is associated with urinary urgency or mixed urinary incontinence in female veterans (Bradley et al., 2012). A second VA-based study found higher than normal rates of urinary incontinence in male veterans as well, although only in those younger than 56 years (Vaughn et al., 2014). There is more attention now being paid to younger patients with these problems.

You can find more information on PMDB at www.bcia.org.

References

- Bradley, C. S., Nygard, I. E., Mengeling, M. A., Tomer, J. C., Stockdale, C. K., Booth, B. M., & Sadler, A. G. (2012). Urinary incontinence, depression, and post-traumatic stress disorder in women veterans. *American Journal of Obstetrics and Gynecology*, 206, 502.e1–502.e8. doi:10.1016/j.ajog.2012.04.016
- Fitzgerald, M. P., & Kotarinos, R. K. (2003). Rehabilitation of the short pelvic floor. I: Background and patient evaluation. *International Urogynecology Journal*, 14, 261–268.
- Glombiewski, J. A., Bernardy, K., & Häuser, W. (2013). Efficacy of EMG- and EEG-biofeedback in fibromyalgia syndrome: A meta-analysis and a systematic review of randomized controlled trials. *Evidence-based Complementary and Alternative Medicine*, 2013, 962741. doi:10.1155/2013/962741
- Gorina, Y., Firoozi, F., & Griebing, T. (2014). Prevalence of incontinence among older Americans. *Vital and Health Statistics*, 3(36). DHHS Publication No. 2014-1420. Centers for Disease Control, National Center for Health Statistics. Hyattsville, MD: US Department of Health and Human Services. Retrieved from http://www.cdc.gov/nchs/data/series/sr_03/sr03_036.pdf
- Hu, T. W., Wagner, T. H., Bentkover, J. D., Leblanc, K., Zhou, S. Z., & Hunt, T. (2004). Costs of urinary incontinence and overactive bladder in the United States: A comparative study. *Urology*, 63, 461–465.
- Lemaire, J. B., Wallace, J. E., Lewin, A. E., Grood, J., & Schaefer, J. P. (2011). The effect of a biofeedback-based stress management tool on physician stress: A randomized controlled clinical trial. *Open Medicine*, 5, e154–e165. PMID: PMC3345375
- National Association for Continence. (n.d.) Conditions. Retrieved September 14, 2015, from <http://www.nafc.org/conditions/>
- Tajiri, K., Huo, M., & Maruyama, H. (2014). Effects of co-contraction of both transverse abdominal muscle and pelvic floor muscle exercises for stress urinary incontinence: A randomized controlled trial. *Journal of Physical Therapy Science*, 26, 1161–1163. doi:10.1589/jpts.26.1161
- U.S. Department of Health and Human Services. (n.d.). Administration on aging: Aging statistics. Retrieved September 14, 2015, from http://www.aoa.acl.gov/Aging_Statistics/index.aspx
- Vaughn, C. P., Johnson, T. M., Goode, P. S., Redden, D. T., Burgio, K. L., & Markland, A. D. (2014). Military exposure and urinary incontinence among American men. *Journal of Urology*, 191, 125–129. doi:10.1016/j.juro.2013.07.016
- Yucha, C., & Montgomery, D. (2008). *Evidence-based practice in biofeedback and neurofeedback*. Wheat Ridge, CO: Association for Applied Psychophysiology and Biofeedback.



Debbie Callif

Correspondence: Debbie Callif, OT, BCB-PMD, Continence & Pelvic Wellness Clinic, 1516 W. Mequon Road Suite 102, Mequon, WI 53092, email: debbie@callif.org.