Intravaginal Biofeedback in Treating Vulvar Vestibulities Syndrome

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ABSTRACT

Objective: *this study conducted to determine the effectiveness of intravaginal biofeedback in reducing pelvic floor over activity and Hyperirritability in relieving dyspareunia as well as improving vulvar vestibulitis syndrome.* ***Patients and methods:*** *twenty-one females, all were newly married (less than 1 year), they all complained of Dyspareunia due to vulvar vestibulitis syndrome. Their ages ranged from 22-29 years with a mean of 25.95±1.94. They were collected at the Outpatient Clinic, Department of Gynecology, Faculty of Medicine Ain Shams University over a period of 2 years starting from December, 2001 till November, 2003. Each patient was given a short-term treatment consist of three treatment sessions per week for two successive months using a intravaginal biofeedback perinometer unit and were evaluated before starting the first session of treatment, after the end of twelfth sessions and at the end of twenty four session of treatment session for all participant in term of measuring the Modified Oswestry Sex life score, Pelvic floor contraction & hyperirritability by digital examination of the Pelvic floor muscle (Subjective Measurement) and by electronic perinometer (objective measurement).* ***Results:*** *Comparing the pre and post treatment (after 12th & 24th session of treatment) the mean values of all measurements parameters revealed significant improvement.* ***Conclusion:*** *According to the results of the present study it could be concluded that A biofeedback-assisted exercise program of the pelvic floor muscles significantly reduces and, in some cases, eliminates symptoms of vulvar vestibulitis syndrome.*

Key words: *Vulvar vestibulitis syndrome, Biofeedback and Pelvic floor muscles.*

INTRODUCTION

Chronic or recurrent pain involving the female reproductive system is a neglected, poorly understood, and costly women's health problem[27]. Dyspareunia, or painful intercourse, a recurrent acute pain that can be located anywhere from the vaginal introitus to the uterus and adnexae, affects 10 - 15% of women in North America; perhaps the most common type of premenopausal dyspareunia is vulvar vestibulitis syndrome[17].

Vulvar vestibulitis syndrome (VVS) is a heterogeneous, multisystemic and multifactorial disease and is one of the leading causes of dyspareunia in women of fertile age[1,3,5,16]. VVS has been described as a clinical disease characterized by three symptoms and signs: (a) severe pain on vestibular touch or attempted vaginal entry; (b) tenderness when pressure is localized within the vestibule; and (c) physical findings confined to vestibular erythema of various degrees[8]. This distressing syndrome has no clear etiological determinants, although it has been associated with repeated yeast infections and other urogenital inflammatory conditions[3,14].

Medical therapies have been advocated for the management of this distressing problem. These include antihistamines, tricyclic antidepressants, compresses, topical

anesthetics and lubricants[21]. Topical remedies do not cure the condition, but soaks of Burow's, Aveeno-oilated or aqueous lidocaine solution have been reported to produce temporary and partial relief of symptoms in some patients[14]. Steroids have been tried for their anti-inflammatory effect[1]. Laser surgery is not recommended due to prolonged and painful healing time. Local injections of alpha interferon (r-alpha IFN) in selected patients have not proven entirely successful, but immunotherapy may be beneficial in some cases[28]. Dietary restrictions and reduction of irritants in the urine or in topical agents are reported as being successful in some cases[24].

Cutaneous Vulvar Clinic physicians at Columbia University College of Physicians and Surgeons first approached me in 1991. They had noticed that during intravaginal digital palpation, the levator muscles of women suffering from vulvodynia manifest considerable chronic "tension and spasticity". These specialists requested the use of biofeedback which is self regulation training technique derived from well established principles of human learning to correct this muscle abnormality and results were good[10,19].

The rational for studying pelvic floor muscles in-patients with vulvar vestibulitis is the fact that these patients usually demonstrate hyperirritability of the pelvic floor muscles [4,11&23]. Travell and simons[25] reported that this hyperirritability could be activated by localized tissue disturbances. Some success has been reported with physical therapy, internal massage, and biofeedback as well.

More recently, Glazer, et al. (2002)[13] has recommended the use of surface electromyographic biofeedback of pelvic floor musculature in order to reduce the instability and hypertonicity of their pelvic floor muscles as an approach to the management of the vulvar pain.

The aim of this clinical trail was to determine the effectiveness of intravaginal biofeedback in the reducing pelvic floor over activity and Hyperirritability in relieving dyspareunia as well as improving vulvar vestibulitis syndrome.

MATERIALS AND METHODS

Patient and Methods

The present study included 21 females, all were newly married (less than 1 year), they all complained of Dyspareunia. Their ages ranged from 22-29 years with a mean of 25.95±1.94. They were collected at the Outpatient Clinic, Department of Gynecology, Faculty of Medicine, Ain Shams University, over a period of 2 years starting from December, 2001 till November, 2003.

All patients included in this study evaluated before starting the treatment through independent gynaecologic examinations carried out according to the following standardized protocol: 1- A urine sample was obtained: 2- A brief interview about past medical history, medication and obstetric gynecologic history including painful intercourse; 3- Vaginal cultures were taken for Candida, Gradnerella, and Trichomonas as well as a Papanicolaua smear if the women had not been tested in the past year; 4- A cotton swab palpation of the labia majora and labia minora (right, left and midline) and six vestibular sites (in a clockwise fasion:12 O'clock then 12-3, 3-6, 6-9 and 9-12O'clock); 5- The degree of vestibular erythema was evaluated on a scale of 0(none) to 3(severe) and noted on a standard bimanual palpation of the following areas was carried out: vagina (anterior vaginal wall, pubococcygeal muscle, uterosacral ligament, insetion of speculum, insertion of finger) uterus (cervix and corpus with and without motion). Women rated the

pain at each site on scale of 0 (no pain) to 10 (worst pain)[16]. Gynecologist was instructed to use Friedrich's criteria as best they could to diagnose vulvar vestibulitis syndrome[7,8].

Table (1): Basic data of examined patients.

	Age	Weight	Height	Body Mass Index
Min	22.00	63.00	160.00	23.42
Max	29.00	75.00	170.00	29.30
Mean	25.95	69.67	166.24	25.22
SD	1.94	3.44	3.45	1.29

Materials

1) Weight-height scale was used for measuring the patient's body weight and height to calculate the body mass index.
2) Preniometer (Peritron 9300): The Peritron 9300 designed by Cardio Design Pty ltd. Australia. It is supplied with vaginal sensor. Technical specification: Numerical readout 0-300 cm H_2o, Resolution 1cm H_2o, Accuracy ±1cm H_2o for 95% of readings, Display liquid crystal 3.5 digits, 12.7mm high with indicator for battery low charge, Output option 0-3.5 VDC into 3.5 K ohms min. proportional to sensor pressure with connecting tube with end fittings has a (T) with one way valve for optional air inflation and vaginal sensor 28 mm diameter; 30 mm active surface, consist of an air-tight seamless silicone rubber sheath over a skeleton that allows the central section to be pressed in radically in response to a muscular contraction. Condoms were used for covering the vaginal probe to avoid cross infections and jell was used for lubrication of the vaginal probe into the vagina.

In practice, the airs displaced from the detachable vaginal sensor travels to a pressure transducer in the monitor unite via a connecting tube. The signal from the transducer is interpreted by microprocessor and displayed either numerically in centimeters water pressure or as a multi-range bar graph for biofeedback. Peak and average readings for the contraction and its duration can be recorded. It was used for objective assessment of the hyper tonicity and strength of pelvic floor muscles contractions as well as inhibition of pelvic floor over activity and teaching muscle re-education before starting the treatment, after the 12^{th} and 24^{th} sessions of treatment.

Methods

Standard diagnostic procedures before inclusion

A- Assessment procedures (was tested before starting the first session of treatment, after the end of twelfth sessions and at the end of twenty four session of treatment session for all participant)

- All were subjected to Modified Oswestry Sex life score[6] to assess the pain induced by sexual intercourse (0-6): my sex life is normal and causes no extra pain; my sex life is normal but causes some extra pain; my sex life is nearly normal but is very painful; my sex life is severely restricted by pain; my sex life is nearly absent because of pain and pain prevents any sex life at all.
- Digital examination by the palpation of the Pelvic floor muscle through intravaginal digital examination (Subjective Measurement): a-using a five levels ordinal scale for Pelvic floor muscle contraction score (0-5): unable to isolate, or no feel tightening; light contraction but unable to

retain examiner's finger; light contraction but unable to sustain tightening for 1 second; moderate contraction also, able to sustain tightening for 3 seconds and strong contraction also, able to sustain tightening for 5 seconds. b-using another five levels ordinal scale for Pelvic floor muscle Hyperirritability score (0-5): no pressure or pain associated with examination; comfortable pressure associated with examination; uncomfortable pressure associated with examination, moderate pain associated with examination, intensifies with Kegel maneuver and severe pain associated with examination, patient is unable to perform Kegel maneuver due to pain.

- Pelvic floor contraction & hyperirritability (objective measurement) by Perinometer (Peritron 9300) evaluating the maximum contraction (highest and average readings) and hypertonicity reading without voluntary contraction (lowest and average readings), the peak, average readings and the duration in seconds can be recalled by holding in the button for more than two seconds.

Treatment procedures

Before starting the treatment sessions patients were asked to evacuate their bladders and this followed by 5 min .They received EMG Biofeedback training to their pelvic floor muscles, through trans-vaginal electrode for twenty minutes, three times weekly for 8 weeks in addition to an exercise program of pelvic floor as a home routine.

Biofeedback Unit preparation

Each patient was trained on localization and isolation of pelvic floor muscles contraction, to achieve the awareness of the muscle contraction; Patient in crock lying position, a pillow or two under her head for comfort, knees and feet 30 cm apart; Covering the vaginal sensor by condom and handle the sensor by the tail of the connector of the connecting tube; Turns on Peritron in numerical mode with the readout display in cm H_2o column pressure by pressing one click of the button to ensure a zero based reading for contraction.

The protocol of training

The women was asked to continue contraction and relaxation of the pelvic floor muscle against the vaginal electrode (sensory feedback) trying to reach a higher reading than the number already visible to her on the screen (visible feedback) aim to increase the muscle strength hence, after that trying to reach a lowest reading than the number already visible to her on the screen (visible feedback) aim to decrease the Hyperirritability of the pelvic floor muscles[2].

- (5- Second) just holding the vaginal electrode without contraction (stretching).
- (Fast twitch fiber) Tighten and relax the pelvic floor muscle against the vaginal electrode as quickly as possible 10-20 times in a row. Relax for a count of 10, and then repeat.
- (5- Second) just holding the vaginal electrode without contraction (stretching).
- (Slow twitch fiber) Tighten the pelvic floor muscle against the vaginal electrode as hard as you can for a count of 10-20. Relax for a count of 10, and then repeat.
- Ten seconds of rest.
- (Fast & slow twitch fiber) Tighten the pelvic floor muscle against the vaginal electrode "halfway" (half as hard as you did for the slow contraction) and hold it for 60 seconds. Relax for a count of 20, and then repeat.

- (5- Second) just holding the vaginal electrode without contraction (stretching) (Quoted from Glazer, et al 1999) [12]. Withdraw the sensor, switch off by clicking the button three times or wait for auto-off after four minutes.

The exercises program lasted for twenty minutes three times a week for eight consecutive weeks. Patients were instructed to do strong muscle contractions of the pelvic muscles (Pubovaginalis, Puborectalis, both fibers together) at home as follows: 60 repetitions of 10 seconds of rest followed by 10 seconds of muscle contraction twice daily with several hours between the 2 practice sessions.

Statistical analysis

The collected data were fed into computer for statistical analysis using SPSS software and the statistical significance at a confidence of 95% (α-level of 0.05).

RESULTS

In this study the Modified Oswestry Sex life score was investigates, before starting the treatment the majority (45.20%) of the subject had pain prevents any sex life at all, after one month of treatment the majority (32.30%)of cases had pain is severely restricted their sex life and after the end of the 24th session of treatment the majority (45.20%) of the subject had no extra pain and their sex life is normal. Comparing the pre treatment results to post treatment (after 12th & 24th session of treatment) by using the chi square test, the differences were found to be statistically highly significant improve in sex life score (P< 0.001), table (2).

Table (2): shows the mean Percentage of Modified Oswestry Sex life score, before starting ttt, one month after ttt & at the end of ttt.

Statistics	Modified Oswestry Sex life score						Z value	P value
	6	5	4	3	2	1		
Before ttt	45.20%	38.70%	16.10%	0.00%	0.00%	0.00%	-4.45	0.001*
After 12th session	3.20%	25.80%	32.30%	25.80%	12.90%	0.00%		
Before ttt	45.20%	38.70%	16.10%	0.00%	0.00%	0.00%	-4.91	0.001*
After 24th session	0.00%	0.00%	0.00%	25.80%	29.00%	45.20%		
After 12th session	3.20%	25.80%	32.30%	25.80%	12.90%	0.00%	-4.97	0.001*
After 24th session	0.00%	0.00%	0.00%	25.80%	29.00%	45.20%		

Z-value: Chi-square P- value: Probability value

1: My sex life is normal & causes no extra pain
2: My sex life is normal but causes some extra pain
3: My sex life is nearly normal but is very painful
4: My sex life is severely restricted by pain
5: My sex life is nearly absent because of pain
6: Pain prevents any sex life at all

Comparing the pre and post treatment mean values of sexual intercourse per month as shown in table (3) and Fig (1), revealed highly significant (P< 0.001) increase where, the mean value pretreatment was 2.09±0.94 times per month, after 12th session of treatment 5.29±1.77 times per month and 11.32±4.53 times per month after the end of 24th session of treatment.

Table (3): Shows the mean values of sexual intercourse per month before starting ttt, after 12th session and at the end of 24th session.

Statistics	Before ttt	After 12th session	Before ttt	After 24th Session	After 12th session	After 24th Session
No.	21	21	21	21	21	21
X	2.09	5.29	2.09	11.32	5.29	11.32
SD	0.94	1.77	0.94	4.53	1.77	4.53
MD	-3.19		-9.23		.6.03	
t-value	-9.25		-11.32		-7.58	
p-value	0.001*		0.001*		0.001*	

t- value: Unpaired t value P- value: Probability value

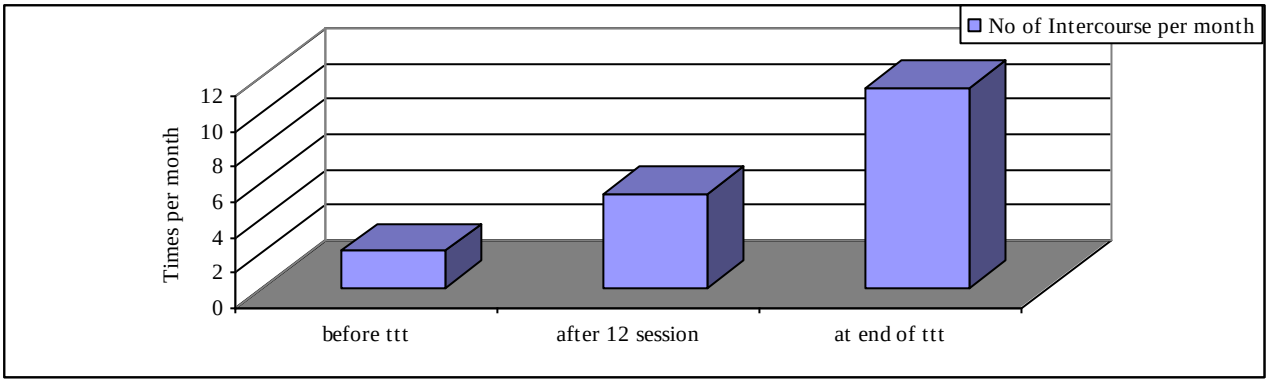

Fig. (1): Illustrate the frequency of sexual intercourse per month before starting ttt, after 12th session and at the end of 24th session.

Digital examination using a five levels ordinal scale for Pelvic floor muscle contraction score (subjective measurement) were presented in table (4). Pre treatment the majority (48.80%) of the subject were unable to isolate nor feel tightening, after one month of treatment the majority (54.80%) of cases perform light contraction but unable to retain examiner's finger for 1 second. and after the end of the 24th session of treatment the majority (48.40%) of the subject perform Moderate contraction also, able to sustain tightening for 3 seconds. Comparing the pre treatment results to post treatment (after 12th &24th session of treatment) by using the chi square test, the differences were found to be statistically highly significant improve in subjective pelvic floor muscle contraction score (P< 0.001).

Table (4): Shows the mean values of Pelvic Floor Contraction Score, before treatment, after12th session and at the end of ttt. (subjective)

Statistics	Pelvic Floor Contraction Score(subjective)					Z value	P value
	1	2	3	4	5		
Before ttt	48.80%	45.20%	6.50%	0.00%	0.00%	-4.7	0.001*
After 12th session	0.00%	19.40%	54.80%	25.80%	0.00%		
Before ttt	48.80%	45.20%	6.50%	0.00%	0.00%	-4.93	0.001*
After24th session	0.00%	0.00%	16.10%	48.40%	35.50%		
After 12th session	0.00%	19.40%	54.80%	25.80%	0.00%	-4.59	0.001*
After 24th session	0.00%	0.00%	16.10%	48.40%	35.50%		

Z-value: Chi-square P- value: Probability value

As shown in table (5), digital examinations using a five levels ordinal scale for Pelvic floor muscle hyperirritability score (subjective measurement). The initial results Pre treatment showed that the majority (71.00%) of the cases had sever pain associated with examination, after one month of treatment the majority (45.20%) of subjects had uncomfortable pressure associated with examination. and after the end of the 24th session of treatment the majority (48.40%) of the subjects had no pressure or pain associated with examination. Comparing the pre treatment results to post treatment (after 12th & 24th session of treatment) by using the chi square test, the differences were found to be statistically highly significant improve in subjective pelvic floor muscle contraction score ($P< 0.001$).

Table (5): Shows the mean values of Pelvic Floor Hyperirritability Score before treatment, after12th session and at the end of ttt. (subjective)

Statistics	Pelvic Floor Contraction Score(subjective)					Z value	P value
	1	2	3	4	5		
Before ttt	71.00%	29.00%	0%	0.00%	0.00%	-5.11	0.001*
After 12th session	0.00%	16.10%	45.20%	38.70%	0.00%		
Before ttt	71.00%	29.00%	0%	0.00%	0.00%	-4.94	0.001*
After24th session	0.00%	0.00%	22.60%	29.00%	48.40%		
After 12th session	0.00%	16.10%	45.20%	38.70%	0.00%	-4.72	0.001*
After 24th session	0.00%	0.00%	22.60%	29.00%	48.40%		

Z-value: Chi-square P- value: Probability value

1: No pressure or pain associated with examination
2: Comfortable pressure associated with examination
3: Uncomfortable pressure associated with examination
4: Moderate pain associated with examination
5: Sever pain associated with examination.

Inspection of table (6) and Fig. (2), revealed highly significant ($P< 0.001$) increase in the mean values of the Pelvic floor contraction (objective measurement) by Preniometer evaluating the maximum contraction (highest and average readings) when comparing pre and post treatment results Where, the mean value pre treatment was 32.81±10.59 CmH_2O, after one month of treatment 56.48± 12.97 CmH_2O and 101.58±26.73 CmH_2O after the end of treatment sessions.

Table (6): Shows the mean values of pelvic floor contraction by electronic periniometer (CmH2O) before ttt, after one month of ttt and at the end of ttt.

Statistics	Before ttt	After 12th session	Before ttt	After 24th Session	After 12th session	After 24th Session
No.	21	21	21	21	21	21
X	32.81	56.48	32.81	101.58	56.48	101.58
SD	10.59	12.97	10.59	26.73	12.97	26.73
MD	-23.67		-68.77		-45.1	
t-value	-12.52		-12.81		-10.24	
p-value	0.001*		0.001*		0.001*	

t- value: Unpaired t value P- value: Probability value

Comparing the pre and post treatment mean values of the pelvic floor hyperirritability by Preniometer (evaluating the hyperirritability without voluntary contraction lowest and average readings) objective measurement as shown in table (7) and Fig. (2), was statistically highly significant (P< 0.001) decrease Where, the mean value pre treatment was 55.29± 5.72 CmH_2O, after the 12th session of treatment 32.32±6.14 CmH_2O and 17.55±8.2 CmH_2O after the end of 24th sessions treatment sessions.

Table (7): Shows the mean values of pelvic floor hyperirritability by periniometer (CmH2O) before ttt, after 12th session of ttt and at the end of ttt.

Statistics	Before ttt	After 12th session	Before ttt	After 24th Session	After 12th session	After 24th Session
No.	21	21	21	21	21	21
X	55.29	32.32	55.29	17.55	32.32	17.55
SD	5.72	6.14	5.72	8.2	6.14	8.2
MD	22.97		37.74		14.77	
t-value	19.65		26.56		16.77	
p-value	0.001*		0.001*		0.001*	

t- value: Unpaired t value P- value: Probability value

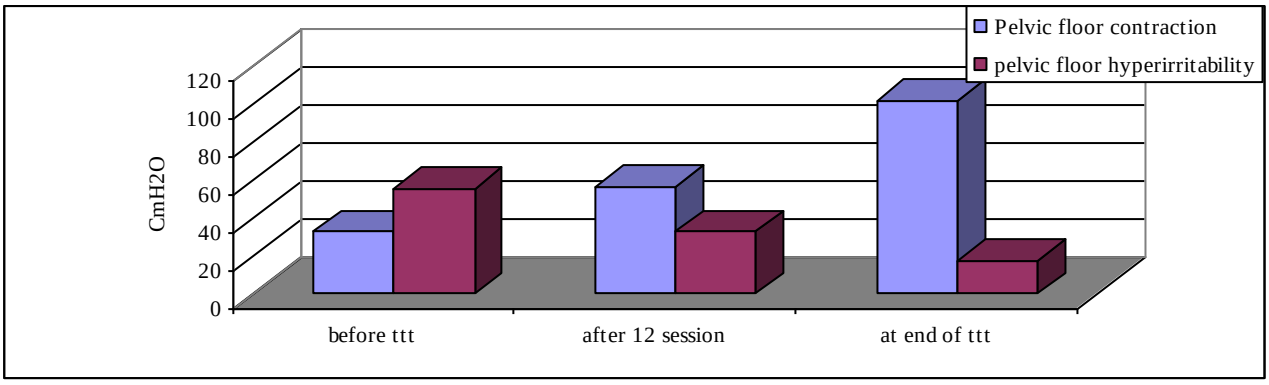

Fig. (2): Illustrate the (objective measurement) of Pelvic floor contraction and hyperirritability before starting ttt, after 12th session and at the end of 24th session.

DISCUSSION

Pelvic floor dysfunction (PFD) has traditionally been described as resulting from laxity or poor tonus of the pelvic floor musculature and/or ligaments. Damage of this nature usually results from aging, straining, or trauma and causes urinary or fecal incontinence and organ prolapse. More attention is focused now on identifying and understanding so-called "high-tone" PFD, a product of hyperclonic or spastic musculature, leading to symptoms such as urinary urgency-frequency, constipation, vulvar pain, dyspareunia, and orgasmic dysfunction[15,18,21].

Pelvic EMG activity in typical vulvar vestibulitis composed of elevated and unstable resting baseline, poor recruitment, spasm on sustained contraction and fatigue, poor recovery and post contraction baseline remains elevated with high amplitude and instability, Eighty eight percent (88%) of patients with a clinical diagnosis of vestibulitis satisfy at least three or more of these abnormal electromyographic criteria[22].

The results of this study suggest significant benefit of using the intravaginal biofeedback of the pelvic floor musculature in the management of women with moderate to severe vulvar vestibulitis may be attributed to strengthening the levator ani muscle there is not only improved contraction strength, more relaxed but also increased muscle stability, less fatigue and a corresponding fall in resting tension. This appears to be associated with and indicative of a less active pudendal nerve which leads to a reduction of pain and an increase in intercourse[11,13].

The results of this piece of work were supported by those of Travell and Simmons[26] who reported that such muscle disturbances are reflected in discoordination of the electromyography (EMG) and are prone to develop in muscles that lie within the pain reference zone of the disturbed tissue and in turn reflex back through a dorsal root spinal cord mechanism to perpetuate tissue disturbances via its effect on local tissue (sympathetic mediated activity, including vascular changes and histamine release). One factor that perpetuates the vulvar skin disturbance is destabilization of pelvic floor muscles and thus the restablization of the muscles should allow this condition to resolve.

The results of intravaginal biofeedback came in agreement with Glazer et al. (1995)[10] who demonstrated a slightly more than 50% cure rate with an average self-reported improvement of 83%, and 80% of sexually abstinent patients resuming regular intercourse. The research showed that only changes in the standard deviation of the resting SEMG signal predicted pain change. This finding confirmed the anecdotal experience that the treatment is essentially an SEMG stabilizing program to decrease the hyperirritability of the pelvic floor muscles. This paper also concluded "The response to this therapy suggests that whatever the initial insult or etiologic factor, vulvar vestibulitis syndrome may be a result of autonomically mediated pain. In 2000 a study was published that concluded that 3–5 years after successful treatment, 100% of those studied remained completely asymptomatic with no reports of either vulvar dysesthesia or introital dyspareunia[9].

Result of intravaginal biofeedback confirm the findings of McKay et al., (2001) [20] who studied the effectiveness of pelvic floor SEMG biofeedback in the management of patients with moderate to severe vulvar vestibulitis syndrome and reported that 84.7% of treated patients reported either negligible or mild pain at the end of the study and 70% resumed sexual activity; this compares favorably to the results of perineoplasty surgery for the treatment of vulvar vestibulitis.

The good results of this study agreed with Bergeron et al. (2001)[4] who reported a randomized controlled comparison of vestibulectomy, electromyographic biofeedback, and group sex therapy/pain management in the treatment of dyspareunia resulting from vulvar vestibulitis. And concluded that both medical and psychological treatments are effective in relieving dyspareunia and recommended a multimodal approach to treatment.

In conclusion, pelvic floor muscle instability is a critical factor in pain associated with vulvar vestibulitis syndrome. A biofeedback-assisted exercise program that stabilizes the pelvic floor muscles significantly reduces and, in some cases, eliminates symptoms of vulvar vestibulitis syndrome.

REFERENCE

1- Baggish, M.S. and Miklos, J.R.: Vulvar pain syndrome: a review. Obstet Gynecol Surv., 50(8): 618-627, 1995.

2- Beji, N.K., Yalcin, O. and Erkan, H.A.: The effect of pelvic floor training on sexual function of treated patients. Int Urogynecol J Pelvic Floor Dysfunct., 14(4): 234-238, 2003.

3- Bergeron, S., Bouchard, C., Fortier, M., Binik, Y.M. and Khalife, S.: The surgical treatment of vulvar vestibulitis syndrome: a follow-up study. J Sex Marital Ther., 23: 317-325, 1997.

4- Bergeron, S., Binik, Y.M., Khalife, S., Pagidas, K., Glazer, H.I., Meana, M. and Amsel, R.: A randomized comparison of group cognitive--behavioral therapy, surface electromyographic biofeedback, and vestibulectomy in the treatment of dyspareunia resulting from vulvar vestibulitis. Pain, 91(3): 297-306, 2001.

5- Danielsson, I., Eisemann, M., Sjoberg, I. and Wikman, M.: Vulvar vestibulitis: a multi-factorial condition. BJOG, 108: 456–461, 2001.

6- Fairbank, J.C.T. and Pynsent, P.B.: The Oswestry Disability Index. Spine, 25(22): 2940-2953, 2000.

7- Friedrich, E.G. Jr: The vulvar vestibule. J Reprod Med., 28: 773-777, 1983.

8- Friedrich, E.G. Jr.: Vulvar vestibulitis syndrome. J Reprod Med., 32(2): 110-114, 1987.

9- Glazer, H.I.: Dysesthetic vulvodynia. Long-term follow-up after treatment with surface electromyography-assisted pelvic floor muscle rehabilitation. J Reprod Med., 45(10): 798-802, 2000.

10- Glazer, H.I., Rodke, G., Swencionis, C., Hertz, R. and Young, A.W.: Treatment of vulvar vestibulitis syndrome with electromyographic biofeedback of pelvic floor musculature. J Reprod Med., 40(4): 283-290, 1995.

11- Glazer, H.I., Jantos, M., Hartmann, E.H. and Swencionis, C.: Electromyographic comparisons of the pelvic floor in women with dysesthetic vulvodynia and asymptomatic women. J Reprod Med., 43(11): 959-962, 1998.

12- Glazer, H.I., Romanzi, L. and Polaneczky, M.: Pelvic Floor Muscle Surface Electromyography: Reliability and Clinical Predictive Validity, J. Reprod. Med., 44: 9: 779-782, 1999.

13- Glazer, H.I., Marinoff, S.C. and Sleight, I.J.: Web-enabled Glazer surface electromyographic protocol for the remote, real-time assessment and rehabilitation of pelvic floor dysfunction in vulvar vestibulitis syndrome. A case report. J Reprod Med., 47(9): 728-730, 2002.

14- Goetsch, M.F.: Vulvar vestibulitis: prevalence and historic features in a general gynecologic practice population. Am J Obstet Gynecol., 164: 1609-1614; discussion 1614-1616, 1991.

15- Graziottin, A.: Clinical approach to dyspareunia. Journal of Sex and Marital Therapy, 27: 480-501, 2001.

16- Graziottin, A., Nicolosi, A.E. and Caliari, I.: Vulvar vestibulitis and dyspareunia: The "pain map" and the medical diagnosis. Poster presented at the International meeting of the Female Sexual Function Forum, Boston, 70-77, 2001.

17- Laumann, E.O., Gagnon, J.H., Michael, R.T. and Michaels, S.: The social organization of sexuality, University of Chicago Press, Chicago, IL, 254-260, 1994.

18- Mann, M.S., Kaufman, R.H., Brown, J.R. and Adam, E.R.: Vulvar vestibulitis: Significant clinical variables and treatment outcome. Obstet Gynecol, 79(1): 122-125, 1992.

19- McKay, M.: Vulvitis and vulvovaginitis: cutaneous considerations. Am J Obstet Gynecol., 165: 1176-1182, 1991.

20- McKay, M., Kaufman, R.H., Doctor, U., Berkova, Z., Glazer, H. and Redko, V.: Treating vulvar vestibulitis with electromyographic biofeedback of pelvic floor musculature. J Reprod Med., 46(4): 337-342, 2001.

21- Peckham, B.M., Maki, D.G. and Patterson, I.J.: Focal vulvitis: A characteristic syndrome and cause of dyspareunia: Features, natural history

and management. Am J Obstet Gynecol., 154: 855-864, 1986.
22- Perry, J.D.: Handbook of EMG Perineometry. Sixth edition. Fort Lauderdale, Florida, Biotechnologies, 55-70, 1987.
23- Perry, J.D., Hullett, M.S. and Bollinger, J.R.: EMG biofeedback treatment of incontinence and other disorders of the pelvic musculature. Presented at the Meeting, Biofeedback Society of America, Colorado Springs, Colorado, 88-90, 1988.
24- Solomons, C., Melmed, H. and Heitler, S.: Calcium citrate for vulvar vestibulitis: A case report. J Reprod Med., 36: 879-882, 1991.
25- Travell, J. and Simons, D.: Myofascial Pain and Dysfunction: The Trigger Point Manual, Volume 2, The Lower Extremities. Williams and Wilkins. Baltimore, 145-165, 1992.
26- Travell, J. and Simons, D.: The Trigger Point Manual. First Volume. Baltimore, William and Wilkins, 145-155, 1993.
27- Walling, M.K. and Reiter, R.C.: Chronic pelvic pain. In M.W. O'Hara, R.C. Reiter, S.R. Johnson, A. Milburn and J. Engeldinger (Eds.), Psychological Aspects of Women's Reproductive Health, Springer Publication Company, New York, NY, 65-80, 1995.
28- Weijmar-Schultz, W.C., Gianotten, W.L., Van der Meijden, W.I., Van der Wiel, H.B., Blindeman, L. and Chadha, S.: Behavioral approach with or without surgical intervention to the vulvar vestibulitis syndrome: a prospective randomized and non-randomized study. J Psychosom Obstet Gynaecol., 17: 143-148, 1996.

الملخص العربي

التغذية الحيوية الرجعية المهبلية في معالجة متلازمة التهابات المدخل الفرجي

الهدف من هذه الدراسة : أجريت هذه الدراسة لتحديد تأثير فعالية التغذية الحيوية الرجعية المهبلية في تقليل النشاط الزائد لعضلات الحوض الرافعة و العسر في الجماع لدي السيدات اللائى تعانين من متلازمة التهابات المدخل الفرجي . **المرضى والطرق:** أجريت هذه الدراسة على واحد وعشرون سيدة متطوعة، كلهن متزوجات حديثا (أقل من سنة واحدة)، تعانين من العسر في الجماع بسبب متلازمة التهابات المدخل الفرجي و قد تم اختيارهن عشوائيا من العيادة الخارجية لأقسام النساء و التوليد مستشفي أمراض النساء و التوليد كلية طب جامعه عين شمس على مدى سنتان بدء من ديسمبر 2001 حتى نوفمبر2003 وكانت أعمارهن تتراوح ما بين 22-29 عاما ، وتم علاجهن باستخدام التغذية الحيوية الرجعية المهبلية وكانت مدة العلاج شهرين متعاقبين بمعدل ثلاث أيام أسبوعياً. تم تقييمهن قبل بدء الجلسة الأولى ، بعد نهاية الجلسة الثانية عشرة وفي نهاية الجلسة الرابعة والعشرين عن طريق قياس استخدام المقياس المدرج المرئي في تقيم الحياة الجنسية و استخدام جهاز قياس الضغط المهبلى(مقياس موضوعي) والفحص الاصبعى (مقياس شخصي) لقياس كل من قوة انقباض والنشاط الزائد لعضلات الحوض الرافعة . **النتائج :** أثبتت النتائج أن هناك فروق ذات دلالة إحصائية ايجابية عند مقارنتها بالنتائج الأولية قبل إجراء البحث . **الخلاصة :** طبقا لنتائج الدراسة الحالية يمكن أن تستنتج بأنّ التغذية الحيوية الرجعية المهبلية ذا تأثير فعال و كبير في تقليل النشاط الزائد لعضلات الحوض الرافعة و العسر في الجماع، وفي بعض الحالات، يزيل أعراض متلازمة التهابات المدخل الفرجي.