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Effect of Kinesiotaping on Activation of Abdominal Muscles in Female Patients with Stress Urinary Incontinence: Narrative Review

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Abstract

Background: No doubt that stress urinary incontinence is associated with social undeniable impacts, embarrassment, impaired emotional and psychological well-being, also limited self-perception. Almost SUI have not yet been fully understood.

Aim of Study: To evaluate the effect of kinesiotaping on activation of abdomino-pelvic cavity in female patients with stress urinary incontinence. However, pelvic floor musculatures are considered the main active support for the pelvic floor. In addition, other synergistic muscles, such as the diaphragm and transversus abdominis muscles also actively support pelvic floor. Numerous studies reported that mild-to-moderate physical activity decreases the odds and risks of urinary incontinence, because that might induce positive effects on SUI. As well, Kinesio Taping is rehabilitative technique used to facilitate the body's natural healing process while providing support and stability.

Conclusion: Adding kinesiotaping over abdominal cavity stimulates reflexive mechanism of action, it could be addressed as an effective therapeutic modality for management of stress urinary incontinence.

Key Words: *Abdominal Muscles – Kinesiotaping – Stress Urinary Incontinence.*

Introduction

INVOLUNTARY urine leakage during activities that increase intra-abdominal pressure, such as coughing, sneezing, or exercise, is known as stress urinary incontinence (SUI) **[1]**. SUI is considered one of the most common gynecologic challenges in the 21st century for women of all ages and races, and it frequently occurs simultaneously **[2,3].** Up to date, approximately estimated SUI prevalence is 10-39%among worldwide women, where approximately 10% of adult females experience urinary leakage at least once per week, as well as 25-45% experience occasional urinary leakage **[4].**

Fortunately, SUI is a technical term for an involuntary urinary leakage with exertion and/or change in intra-abdominal pressure associated with numerous activities such as coughing, sneezing, laughing, jumping, lifting, running or any form of vigorous physical exertion. Mechanical impairments, such as a shorter functional urethral length in women and dysfunction in pelvic floor muscles, also lead to leakage from the striated urethral sphincter. SUI often arises from weakened or impaired pelvic floor muscles and abdominal walls **[5,6]**. Repeated or continuous increases in abdominal pressure from heavy lifting, obesity, or chronic coughing can further strain the pelvic floor and increase the risk of damage. These factors are particularly significant for individuals with a body mass index (BMI) over thirty or for women involved in intense physical activities **[7].**

All continuously or repeatedly attributing situations raise abdominal pressure exert additional strain over pelvic floor thus maximize incidence of pelvic floor damage. Heavy lifting, obesity or coughing are frequently reported contributing factors for incontinence, particularly among whom body mass index over thirty kilogram per meter square, or women exert vigorous physical activities **[5].**

Clinical SUI diagnosis is confirmed via urodynamic evaluation of valsalva and abdominal leak point pressures, which do not reflect SUI severity or enhance the monitoring efficacy of therapeutic intervention **[6-8].**

No debt that SUI women have limited shearing strength of anterior vaginal wall based on intravagi-

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nal dynamometry, with peak resistance to passively stretched levator ani muscle, also paravaginal structures [8]. Furthermore, slower and much lower intravaginal pressure at rest according to intravaginal dynamometer, or perineometry even with maximal pelvic floor musculatures` effort exerted, among SUI women whom represented much slower contraction for levator ani muscle with limited capability to sustain such contraction [9].

Numerous conservative treatments for SUI have been approved, including pharmacological treatment, behavioral therapy, and physical therapy, which encompass various therapeutic methods such as pelvic floor muscle exercises, acupuncture, biofeedback, electrical stimulation, magnetic field therapy, and kinesiotaping [10-12].

Kinesiotaping is a rehabilitative technique that provides support and stability to muscles using elastic tape. When applied to specific abdominal areas, kinesiotaping stimulates the skin-organ and organ-skin mechanisms. The application of kinesiotaping helps maintain the normal physiological function of pelvic organs, relying on the close cooperation and interaction between the pelvis, pelvic floor muscles (PFM), and their synergists. However, no previous studies have examined the effect of kinesio taping on the abdominopelvic cavity in women with SUI [13-14].

Conventional management:

The European Association of Urology recommends physical therapy modalities to manage SUI [15]. Pelvic floor exercises help women activate their pelvic floor muscles to prevent urine leakage during activities that increase abdominal pressure, such as laughing or lifting. Pelvic floor exercises enhance urethral sphincter function and overall pelvic support. Additionally, strengthening the pelvic floor supports the abdominal wall muscles and stabilizes the lumbosacral spine, optimizing pelvic floor function [16,17].

Electrical stimulation can enhance the severity of SUI [2]. By stimulating the pudendal nerve, electrical stimulation improves urethral closure and promotes pelvic floor activation. This method also increases conscious awareness of the pelvic floor muscles, leading to better voluntary muscle contraction.

Recent rehabilitation management for women suffering from SUI involves biofeedback as a modality. Most biofeedback settings focus on the self-awareness of SUI women while conducting pelvic floor musculatures, including levator ani strengthening. Both intravaginal and surface small electrodes provide sufficient input data for exerted efforts that are maximized by visual and/or auditory modalities; those encourage SUI women to exert their maximal muscular exertion [17-20]. Additionally, training using vaginal cones has been recognized as an effective training method. This technique involves biofeedback through vaginal cones to support pelvic floor muscle training and as a resistive training [18,19].

Kinesiotaping: A New Trend

Kinesio taping (KT), developed in Japan in the 1970s by Kenzo Kase, uses elastic polymer strands wrapped in cotton fibers with an acrylic adhesive that activates with body heat. KT supports fascia and soft tissues, improves circulation, reduces pain and muscle spasms, and enhances proprioceptive feedback [21,22].

A systematic review indicates that KT's effectiveness varies from limited to moderate. It may improve blood flow and muscle activity by expanding interstitial spaces and stimulating cutaneous receptors and alpha motoneurons. KT also enhances stability, circulatory function, and lymphatic balance and can reduce pain signals by generating sensory impulses and influencing intracellular calcium fluxes in adjacent C-fibers [23,24].

Dynamic KT is increasingly recognized as a valuable therapeutic tool in both rehabilitation and sports, with growing evidence supporting its benefits. Radiological studies have shown that KT can mechanically alter underlying tissues, aid in muscle movement, and facilitate lymph fluid drainage [25-27].

Kinesiology: SUI Alternative Explanation

Recent guidelines highlight the importance of incorporating pelvic and related muscles into the therapeutic management of weakened pelvic floor muscles in women with SUI [28,29]. KT offers significant musculoskeletal stimulation, which helps recruit muscle fibers, leading to improved muscle function. This, in turn, can alleviate pain and disability by normalizing muscle tone, enhancing postural control, and boosting proprioception [30].

A recent study ensured that the six-week physical therapy treatment protocol of pelvic floor muscle training in combination with KT was more effective for management of women suffering from overactive bladder syndrome. Therefore, KT, plus pelvic floor musculatures training was recommended as a complementary management approach [31-33]. Experimental evidence ensured that a combination of KT and therapeutic exercise training in a postnatal physical therapy program would provide greater gains in terms of improving the strength of the rectus abdominis and oblique abdominal muscles in twenty-four women based on an abdominal endurance test [34].

Moreover, Karaaslan and his colleagues studied 34 participants' suffering from overactive bladder through examination of their bladder symptoms' se-

verity, pelvic floor musculatures' strength using a perineometer, and participants' quality of life using a King Health questionnaire. They were agreed with our findings by ensuring the efficacy of pelvic floor muscle strength based on pelvic muscle exercise training **[35].**

Conclusion:

Among SUI women, adding KT over abdominal muscles to pelvic floor muscle training could be addressed as an effective therapeutic modality for the management of SUI.

Acknowledgments:

The authors certify that they comply with ethical guidelines for authorship and provide the best for their SUI women.

Conflict of Interest:

The authors declare no conflicts of interest. None of the authors have any other financial or personal relationships that could inappropriately influence or bias the content of the current article.

References

1- PANG H., LV J., XU T., LI Z., GONG J., LIU Q., WANG Y., WANG J., XIA Z. and LI Z.: Incidence and risk factors of female urinary incontinence: A 4-year longitudinal study among 24 985 adult women in China. BJOG Int. Journal of Obstetrics and Gynaecology, 129 (1): 580-589, 2022.

2- CELENAY T.S., KAVALCI B., KARAKUS A. and ALKAN A.: Effects of kinesio tape application on pain, anxiety, and menstrual complaints in women with primary dysmenorrhea: A randomized sham-controlled trial. Complementary Therapies in Clinical Practice, 39 (9): 101148, 2020.

3- CASSIDY T., FORTIN A., KACZMER S., SHUMAKER J.T., SZETO J. and MADILL S.J.: Relationship between back pain and urinary incontinence in the Canadian population. Journal of Physical Therapy, 97 (4): 449-454, 2017.

4- ABRAMS P., ANDERSSON K.E., APOSTOIDIS A., BIRDER L., BLISS D., BRUBAKER L., et al.: 6th International consultation on incontinence. Recommendations of the international scientific committee: Evaluation and treatment of urinary incontinence, pelvic organ prolapse and faecal incontinence. Urology and Urodynamics, 37 (7): 2271-2272, 2018.

5- MITTAL R., RATH G., SAHAI R.N. and AGGARWAL M.: Understanding pelvic floor in women. Int Journal of Reprod Contraception, Obstetrics and Gynecology, 9 (10): 4329-4336, 2020.

6- TYAGI V.: Urinary incontinence. In: Layden EA, Thomson A, Owen P, Madhra M, Magowan B, eds. Clinical Obstetrics and Gynecology. 5th ed. Philadelphia, PA: Elsevier; Chapter: 11. Pages: 1562-1563, 2023.

7- BORDONI B., SUGUMAR K. and LESLIE S.W.: Anatomy, abdomen and pelvis, pelvic Floor. In StatPearls; StatPearls Publishing: Treasure Island, FL, USA, 2020; Available online: https://www.ncbi.nlm.nih.gov/books/NBK428220(accessed on 17 November 2021).

8- HALSKI T., PTASZKOWSKI K., SŁUPSKA L., DYMAREK R. and PAPROCKA-BOROWICZ M.: Relationship between lower limb position and pelvic floor muscle surface electromyography activity in menopausal women: A prospective observational study. Clinical Intervention. Aging Journal, 12 (2): 75-83, 2017.

9- EASLEY D., ABRAMOWITCH S. and MOALLI P.: Female pelvic floor biomechanics: Bridging the gap. Curr. Opin. Urol., 27: 262-267, 2017.

10- DAMEN-VAN BEEK Z. and WIERSMA T.: Practice guideline 'Urinary incontinence in women' from the Dutch College of General Practitioners. Nederlands Tijdschrift-voor Geneeskunde, 160 (1): 674-683, 2016.

11- Chinese Medical Association Obstetrics and Gynecology Branch Gynecology: Pelvic Floor Group Guidelines for the diagnosis and treatment of female stress urinary incontinence. Chinese Journal of Obstetrics and Gynecology, 52 (3): 289-293, 2017.

12- KRZYSTOSZEK K. and TRUSZCZYNSKA-BASZAK A.: Physical therapy in stress urinary incontinence among women- a review of the literature and a suggested treatment protocol. Journal of Medical Rehabilitation, 21 (4): 120-151, 2017.

13- JARON A., KONKOL B., GABRYSZ-TRYBEK E., BLADOWSKA J. and GRZYWACY A.: Kinesio taping a healing and supportive method in various fields of medicine, dentistry of medicine, dentistry, sport and physiotherapy. Baltics Journal of Health Physical Activity, 13 (2): 11-25, 2021.

14- KRAJCZY M., LUNIEWSKI J., BOGACZ K. and SZCZEGIELNIAK J.: Evaluation of applying Kinesio taping in children with urinary incontinence. Journal of Pediatrics` Urology, 550 (e1): 550-566, 2018.

15- NIPA S.I., SRIBOONREUNG T., PAUNGMALI A. and PHONGNARISORN C.: The Effects of Pelvic Floor Muscle Exercise Combined with Core Stability Exercise on Women with Stress Urinary Incontinence following the Treatment of Nonspecific Chronic Low Back Pain. Journal of Advanced Urology, 2022 (1): 2051374-2051382, 2022.

16- Lopez-Liria R., Varverde-Martinez MdLA, Padilla-Gongor D. and ROCAMORA-PEREZ P.: Effectiveness of physiotherapy treatment for urinary incontinence in women: A systematic review. Journal of Womens' Health (Larchmt), 28 (4): 490-501, 2019.

17- MAZUR-BIALY A., KOŁOMAŃSKA-BOGUCKA D., NOWAKOWSKI C. and TIM S.: Urinary Incontinence in Women: Modern Methods of Physiotherapy as a Support for Surgical Treatment or Independent Therapy. Journal of Clinical Medicine, 9 (3): 1211-1219, 2020.

18- DE ABREU D., RODRIGUES P., AMARAL CORRÊA L., LACOMBE A., ANDREOTTI D. and NOGUEIRA L.: The Relationship between Urinary Incontinence, Pelvic Floor Muscle Strength and Lower Abdominal Muscle Activation

among Women with Low Back Pain. European Journal of Physiotherapy, 21 (1): 2-7, 2018.

19- HERBISON G.P. and DEAN N.: Weighted vaginal cones for urinary incontinence. Cochrane Database System Revision, (7): CD002114, 2013.

20- HWANG U.J., LEE M.S., JUNG S.H., AHN S.H. and KWON O.Y.: Effect of pelvic floor electrical stimulation on diaphragm excursion and rib cage movement during tidal and forceful breathing and coughing in women with stress urinary incontinence: A randomized controlled trial. Journal of Medicine (Baltimore), 100 (1): e24158, 2021.

21- SELVA F., PARDO A. and AGUADO X.: A study of reproducibility of kinesiology tape applications: Review, reliability and validity. BMC Journal of Musculoskeletal Disorders, 20 (1): 53-61, 2019.

22- NAUGLE K.E., HACKETT J., AQEEL D. and NAUGLE K.M.: Effect of different Kinesio tape tensions on experimentally-induced thermal and muscle pain in healthy adults. Journal. PLoS One Journal, 16 (11): e0259433-e0259439, 2021.

23- MORRIS D., JONES D., RYAN H. and RYAN C.G.: The clinical effects of kinesio Tex taping: A systematic review. Journal of Physiotherapy Theory and Practices, 29 (4): 259-270, 2012.

24- PARREIRAPDO C., COSTA LDA C., HESPANHOL JUNIOR L.C., LOPES A.D. and COSTA L.O.: Current evidence does not support the use of Kinesio taping in clinical practice: A systematic review. Journal of Physiotherapy, 60 (2): 31-39, 2014.

25- JUNGINGER B., BAESSLER L. and SAPSFORD R.: Effect of abdominal and pelvic floor tasks on muscle activity, abdominal pressure and bladder neck. International Urogynecology Journal, 21 (1): 69-77, 2010.

26- BO K. and NYGAARD I.E.: Is Physical Activity Good or Bad for the Female Pelvic Floor? A Narrative Review. Sports Medicine Journal, 50 (3): 471-484, 2020.

27- CHOI J-H.: Effects of kinesio taping and hot packs on premenstrual syndrome in females. Journal of Physical Therapy Science, 29 (9): 1514-1517, 2017.

28- CELENAY S.T., KARAASLAN Y. and COBAN O.: A comparison of Kinesio taping and external electrical stimulation in addition to pelvic floor muscle exercise and sole pelvic floor muscle exercise in women with overactive bladder: A randomized controlled study. Disability and Rehabilitation Journal, 6 (1): 1-9, 2021.

29- CELENAY S.T., KORKUTB Z., OSKAYC K. and AYDIND A.: The effect of pelvic floor muscle training combined with Kinesio taping on bladder symptoms, pelvic floor muscle strength, and quality of life in women with overactive bladder syndrome: A randomized sham-controlled trial. Journal of Physiotherapy Theory and Practices, 38 (2): 266-275, 2022.

30- GURSEN C., INANOGLU D., KAYA S., AKBAYRAK T. and BALTACI G.: Effects of exercise and kinesio taping on abdominal recovery in women with cesarean section: A pilot randomized controlled trial. Maternal-Fetal Medicine Journal, 293 (2): 557-565, 2016.

31- KARAASLAN Y., CELENAY S.T. and KUCUKDURMAZ F.: Comparison of pelvic floor muscle training with connective tissue massage to pelvic floor muscle training alone in women with overactive bladder: A randomized controlled study. Journal of Manipulation, and Physiotherapy, 44 (4): 295-306, 2021.

32- GHADERI F., MOHAMMADI K., AMIR SASAN R., NIKO KHESLAT S. and OSKOUEI A.E.: Effects of Stabilization Exercises Focusing on Pelvic Floor Muscles on Low Back Pain and Urinary Incontinence in Women. Journal of Urology, 93 (3): 50-54, 2016.

33- AWAD E., AHMED H., YOUSEF A. and ABBAS R.: Efficacy of exercise on pelvic pain and posture associated with endometriosis: Within Subject Design. Journal of Physical Therapy Science, 29 (1): 2112–2115, 2017.

34- FOROZESHFARD M., BAKHTIARY A.H., AMINIANFAR A., SHEIKHIAN S. and AKBARZADEH Z.: Short term effects of kinesio taping on pain and functional disability in young females with menstrual low back pain: A randomised control trial study. Journal of Back Musculoskeletal Rehabilitation, 29 (4): 709-715, 2016.

35- UZUNKULAOĞLU A., GÜNEŞAYTEKIN M., AY S. and ERGIN S.: The effectiveness of Kinesio taping on pain and clinical features in chronic non-specific low back pain: A randomized controlled clinical trial. Turkish Journal of Physical Medicine Rehabilitation, 64 (2): 126-132, 2018.

تأثير شريط الكاينزيو على تحفيز عضلات البطن في مرض السلس البولى للسيدات: مقال سردى

الخلفية العلمية: بلا شك يُؤثر السلس البولى الإجهادى على العديد من السيدات، مما يُؤثر سلباً عليهن سواءً على صحتهن العاطفية والنفسية كما أن له تأثير سابى على ثقتهن بأنفسهن وجودة الحياة لديهن. كما لم يتم حتى الآن تفهم مختلف جوانب سلس البول الإجهادى بشكل متكامل، إلا أنه دوماً ما يكون مصحُوباً بضعف وخلل وظيفى بعضلات الحوض، وكذلك ضعف عضلات البطن وحتى الحجاب الحاجز.

الهدف من الدراسة: تحديد تأثير شريط الكاينيزيو كوسيلة علاجية لتنشيط عضلات البطن لدي الإناث ممن يعانين من السلس البولى الإجهادى. هذا وقد أكدت مختلف الدراسات بأن استمراريه النشاط البدنى سواء البسيط أو المتوسط الشدة يقلل احتمالات الشكوى من السلس البولي الإجهادى. وحديثاً، يُعد شريط الكاينزيو كإحدى الوسائل العلاجية المعتمدة لتنشيط ودعم العضلات والمفاصل، بدون التسبب بإعاقة المدى الحركى.

الإستنتاج: يجب الأعتماد على شريط الكاينزيو على عضلات البطن كأحد العلاجات البديلة الفعالة للتخفيف من أعراض السلس البولى الإجهادى وتحسين جودة الحياة لدى السيدات؛ كما يوصى باستخدام شريط الكاينيزيو كوسيلة علاجية فعالة لعلاج السلس البولى الإجهادى.