

Traditional Chinese Medicine Clinical Research Progress and Regular Discussion of Acupuncture for Nocturia

Fang Wang^{1,a}, Qi Han^{1,b}, Caixia Li^{2,c}, Yongfeng Li^{2,d,*}

¹*School of Acupuncture and Massage, Shaanxi University of Chinese Medicine, Xianyang, Shaanxi, 712000, China*

²*Famous Old Chinese Medicine Studio, Second Affiliated Hospital of Shaanxi University of Traditional Chinese Medicine, Xianyang, Shaanxi, 712000, China*

^a1832316090@qq.com, ^b975693418@qq.com, ^c1002187071@qq.com, ^dlidaifu1213@163.com
**corresponding author*

Keywords: Nocturia, Etiology and Pathogenesis, Acupuncture Treatment

Abstract: Nocturia is a type of disease with increased frequency and volume of urination at night as the main clinical manifestation, whose pathogenesis is still unclear and is a more complex and difficult to treat symptom. More and more clinical studies have shown that acupuncture, as a safe and effective treatment method, has good clinical efficacy on this disease and deserves to be studied in depth. Therefore, searched the literature related to the treatment of nocturia with acupuncture in the past ten years, and summarized the etiology and mechanism of nocturia and acupuncture treatment modalities in order to have a general understanding of it and provide some reference for clinical treatment.

In 2018, the Chinese Expert Consensus on Clinical Diagnosis and Treatment of Nocturia recommended that patients need to get up two or more times at night to urinate due to interruption of sleep due to the urge to urinate as the judgment criterion for nocturia[1]. According to epidemiological surveys, nocturia is prevalent in the population, and the prevalence of nocturia in men and women has been increasing for a long time [2]. The prevalence of nocturia is positively correlated with age, with the middle-aged and old people being the majority [3-5]. The prevalence of nocturia is related to age, with the middle-aged and elderly population being the majority. Nocturia is a major health problem for modern people, with sleep health being the first to suffer.[6] In the long run, it will reduce patients' health and quality of life. In addition, it can adversely affect patients' existing diseases and even increase the risk of death.[7] In addition, it can have adverse effects on the patient's existing diseases and even increase the risk of death.

1. Etiology of Nocturia

1.1. Western Medical Understanding of Nocturia

Modern medicine believes that the causes and pathophysiological mechanisms of nocturia are complex and varied, and the causes can be divided into the urinary system and the non-urinary system[8-9]. The causes of nocturia can be divided into urinary and non-urinary systems. It has also

been found that a history of enuresis in children may increase the risk of nocturia in adulthood[10] The mechanisms of nocturia are complex. In terms of the mechanism of nocturia, there are two clearer statements: nocturia due to decreased bladder function capacity due to overactive bladder (OAB), and nocturia due to increased nocturnal urine output [11]. It has been proposed that the essence of nocturia is caused by an imbalance between the functional storage capacity of the bladder (FBC) and urine production [12]. Other scholars view nocturia as a circadian rhythm dysfunction and suggest that the direction of nocturia research may build on the possible mechanisms already in place and further delve into the pathophysiology [9]

At present, Western medical treatment of nocturia, in addition to lifestyle changes, commonly includes drugs and surgical interventions. However, single drug treatment for nocturia has some unavoidable side effects in addition to the desired effect, so the combination of multiple drugs has become a new treatment direction [13-14]. The combination of multiple drugs has become a new treatment direction. If the above lifestyle modifications and medications do not work well, patients with clear indications for surgery can also be treated with appropriate surgical interventions.

1.2. Understanding of Nocturia in Chinese Medicine

Nocturia belongs to the category of "frequent urination" in traditional Chinese medicine, and medical practitioners have accumulated rich experience in treating it over the ages. In the era of Huangdi Neijing, Suwen - The Essence of the Pulse said, "If the water spring does not stop, the bladder does not hide"; Sui Chao Yuanfang proposed in the Treatise on the Origin of Diseases that frequent urination is due to "deficiency of both the bladder and kidney, and the guest heat multiplies"; Zhang Jiebin of the Ming dynasty suggested that "the spleen and lung are deficient and cannot restrain the water channels" and "the liver and kidney are deficient in Yang and Yang. In the "Treatise on the Origin of the Diseases", it is suggested that frequent urination is due to "deficiency of both the bladder and kidney, and there is a passenger heat multiplying"; in the Ming Dynasty, Zhang Jiebin considered the cause of incontinence from two aspects: "deficiency of the spleen and lung qi, which cannot restrain the water channels" and "deficiency of the liver and kidney yang and yang, which does not hide the bladder"; in the Qing Dynasty, Huang Yuan-you believed that the main cause of frequent urination is deficiency of kidney yang. Modern medical practitioners have also continued to summarize and explore the etiology and pathogenesis based on their predecessors.[15] Gao Ying et al. considered nocturia from both the production and excretion of nocturia, and concluded that the occurrence of nocturia is related to the abnormal functions of the lung, spleen, liver, kidney, and bladder; Wang Chengjian[16] Wang Chengjian analyzed the pathogenesis of nocturia from both local and global perspectives, and concluded that the deficiency of kidney qi, the deficiency of coldness in the lower yuan, and the failure of bladder contraction are the main causes, while the overall water distribution, regulation, and warmth are related to all five organs. In summary, nocturia is located in the kidney and bladder, and the pathogenesis is based on the deficiency of the five organs, with the kidney, lung, and spleen being the three organs to blame.

2. Progress in Acupuncture Treatment

2.1. Acupuncture Treatment

Ma Xiangli[17] It was found that the occurrence of nocturia is related to the decline of kidney function, and according to the close connection between the Governor's Vessel and the brain, kidney and bladder, the parietal midline, which is located where the Governor's Vessel enters the brain, was used to treat patients with nocturia with Professor Jin Rui's urinary triple acupuncture (Zhongji, Guanyuan and Sanyinjiao) with good results. Duan Shengde[18] et al. treated 45 elderly

patients with nocturia using Dong's Qi points of Tianhuang and Kidney Guan, and found that the number of nocturia, nocturnal urine volume, and sleep quality of the patients were all significant when compared before treatment, and the efficacy was better with two courses of treatment. Tan Yuanqi [19] et al. observed the efficacy of the awakening acupuncture method on patients with nocturia caused by sleep disorders and found that the efficacy of the awakening acupuncture method was better than that of the conventional acupuncture method. Zhao Junfei [20] Observed the clinical efficacy of combining acupuncture with combined auricular acupuncture pressure and conventional acupuncture in the treatment of nocturia in the elderly, and found that both treatment methods were effective, but acupuncture with auricular acupuncture was more effective, which is shown in Figure 1 and 2.



Figure 1: Acupuncture Treatment

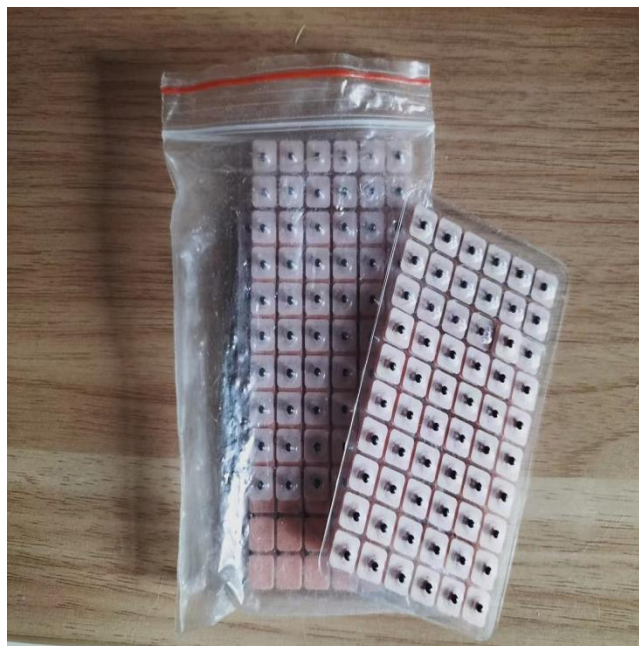


Figure 2: Ear acupuncture patch

2.2. Moxibustion Treatment

2.2.1. Moxibustion

Han Lihong[21] The observation group chose to apply moxibustion at the order of the above acupuncture points when the qi and blood flowed into the kidney meridian at You time, and the results showed that ziwu flowing gentle moxibustion could better improve the bladder qi function and reduce the frequency of nocturnal urination of patients. Deng Xihong[22] Selecting Qihai Guiyuan segment as the center and within a radius of about 3 cm and finding sensitive points to apply moxibustion within a radius of about 3 cm centered on the bilateral subluxation, significantly improved the patient's nocturnal urination. Zhang Weiwei[23] et al. randomly divided 240 patients with nocturia into thermal moxibustion group and traditional moxibustion group, and the total effective rate of thermal moxibustion group was significant after 3 courses.

2.2.2. Supervised Moxibustion

Moxibustion is shown in Figure 3, it can combine meridian, acupuncture point, medicine and moxibustion into one, which can tonify the kidney, help Yang and benefit the marrow, strengthen the essence and fill the essence. Qiongqiong Zhang [24]. A study setting up an observation group (dou moxibustion group) and a control group (medication group) found that dou moxibustion therapy was superior to medication in improving the Chinese medical symptoms in patients with nocturia of the kidney yang deficiency type. Cui Jianfeng[25] et al. found through a controlled clinical trial that shrinking spring governor's moxibustion powder pavement moxibustion was comparable to traditional moxa pillar acupuncture point moxibustion with daily moxibustion in terms of nocturnal urine volume, number of nocturnal urination, nocturnal polyuria index all, and time to 1st awakening.

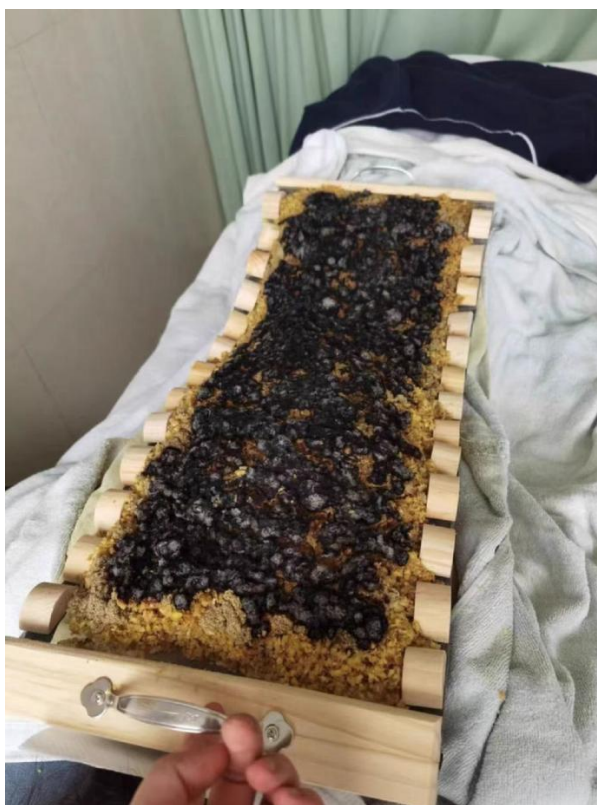


Figure 3: Supervised moxibustion (Chinese medicine)

2.2.3. Warm Acupuncture

As shown figure 4, warm acupuncture is combination of acupuncture and moxibustion. Gong Ruizhang[26] Adopting warm acupuncture to treat 120 elderly patients with frequent nocturnal enuresis, with an efficiency of 95.8%. Yu Liang[27] et al. treated a patient with frequent nocturnal urination and kidney yang deficiency using Guan Yuan warm acupuncture Qi acupuncture therapy, and after 10 treatments, the patient's nocturnal urination was basically controlled from 3 to 4 times/night to 1 ~ 2 times per night, which improved the patient's quality of life.

2.3. Combination of Acupuncture and Moxibustion

He Qing[28] The observation group was treated with acupuncture combined with salt moxibustion at Qihai, GuanYuan and Zhongji points on the basis of acupuncture treatment in the control group. Feng Houqiao[29] et al. used abdominal acupuncture with box moxibustion to treat 20 cases of nocturnal enuresis in elderly men. The main acupuncture points were selected from Zhonggui, Hypochondrium, Qihai and Guangyuan, and the secondary acupuncture points were taken from Qi and Dahe, and the total effective rate was as high as 95%. Zhou Jiajia[30] A control group (abdominal acupuncture group) and a treatment group (thermal moxibustion plus abdominal acupuncture group) were established to treat elderly patients with nocturia, and the number of nocturia in both groups was found to be reduced, and the total effective rate of the treatment group was higher than that of the control group. Wang Xinhua[31] et al. set up an acupuncture group with Dong's strange acupuncture point "Xia San Huang" combined with moxibustion Ba Xiao, and a general acupuncture group with the conventional idea of acupuncture for the treatment of elderly patients with nocturia, was found to improve nocturia symptoms in both groups at the end.



Figure 4: Acupuncture needles and moxa columns

3. Discussion on the Rules of Selecting Meridians and Acupuncture Points for Acupuncture Treatment of Nocturia

3.1. Exploration of Acupuncture Point Selection Rules for Nocturia from Acupuncture Point Main Treatment

The top 5 high-frequency acupoints selected for acupuncture treatment of nocturia in this paper are Qihai, Guangyuan, Zhongji, Sanyinjiao, and Yongquan. Qihai is located in the lower jiao and in the bladder region, so it can treat urinary system diseases such as enuresis and urination. Guan Yuan, which is the meeting of the foot San Yin and Ren Chakras, has the function of tonifying the kidneys and cultivating the Yuan, as stated in the "Thousand Gold Formula", "Guan Yuan and Yong Quan are the main points for urination and urination". It is also the meeting point of the Sanyin and Ren Vessels, and is described in Acupuncture and Moxibustion Dacheng as the main treatment for frequent urination. San Yin Jiao (San Yin Jiao) is the meeting point of the three yin channels: Foot Tai Yin, Turbulent Yin, and Shao Yin, and is used to regulate the liver, spleen, and kidneys. Yongquan, the well point of the foot Shaoyin Kidney meridian, is often used for acupressure and moxibustion in the literature collected here, and acupuncture is rare.

3.2. Exploration of Acupuncture Point Selection Rules for Nocturia Treatment from the Normalized Meridian

From the above literature, it can be seen that in addition to the head acupuncture of the microneedle system, ear acupuncture and other empirical points such as Dong's qi points and urinary triple acupuncture, the majority of acupuncture points are classified as the 14 main meridians, as shown in figure 5, and the commonly used meridians are the Ren channel, the Foot Taiyin Spleen channel, the Foot Shao Yin Kidney channel, and the Foot Sun Bladder channel, in addition to the Foot Yangming Stomach channel, which is also involved but used less frequently. In the Suwen - Bone and Space Theory, "The Ren Vessel starts under the Central Pole, goes up to the hairy interval, follows the abdomen, and goes up to the Guan Yuan". The tenth book of the Ling Shu - meridians states that "the spleen and foot Tai Yin pulse enters the abdomen, belongs to the spleen, contacts the stomach, goes up the septum, holds the pharynx, connects to the tongue and disperses under the tongue." "Bladder Foot Sun's pulse ... holds the spine against the middle of the waist, enters the brawn, contacts the kidney, and belongs to the bladder." "The pulse of the Kidney Foot Shao Yin, ... through the spine belongs to the Kidney and contacts the bladder." "Stomach foot Yangming's vein, its branch, the lower diaphragm, belongs to the stomach, ligating the spleen; its straight, from the lack of basin under the breast internal Lian, down holding the umbilicus, into the gas street; its branch, starting at the mouth of the stomach, down through the abdomen, down to the gas street and closed", the selection of the above meridians all reflect the principle of the meridians through, the main treatment of the reach.

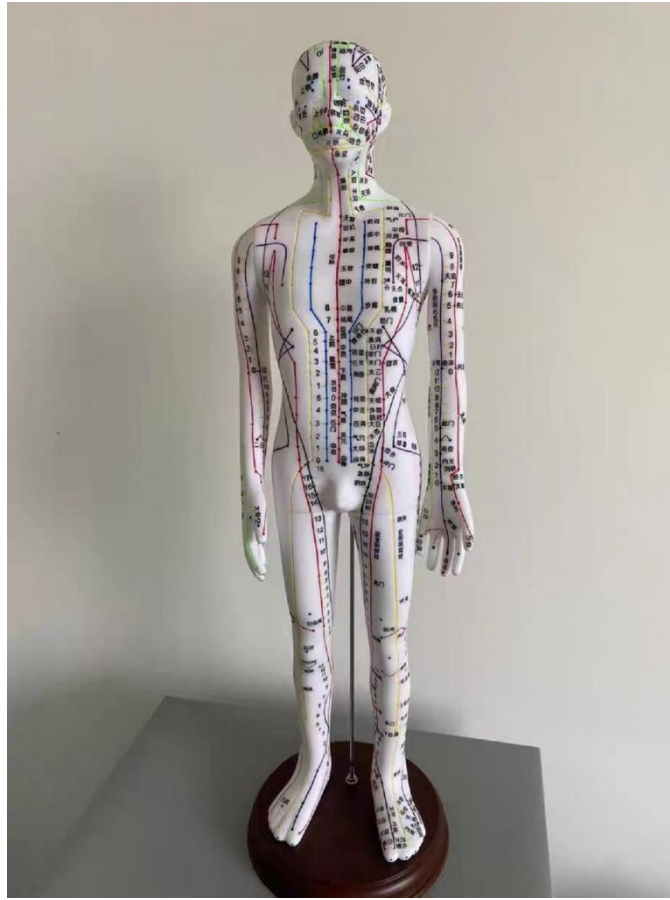


Figure 5: Meridians

3.3. Exploring the Pattern of Acupuncture Point Selection for the Treatment of Nocturia from Distribution Sites and Frequency of Specific Points

The abdomen and lower back are the most commonly used acupuncture points for nocturia, with the lower abdomen and the corresponding hip-sacral acupoints being the main ones. Nocturia is located in the kidney and bladder, and the dysfunction of both organs is the main factor in nocturia. Previous studies of the neurophysiological structure of acupuncture points have shown that the nerves affecting bladder function are: the pelvic visceral nerve, the inferior abdominal nerve, and the pubic [32]. Acupuncture points in the lower abdomen and hip-sacral region are associated with these nerves, suggesting that acupuncture of these points can affect the peripheral nerves associated with urination, which in turn can be reflected in changes in bladder function.

4. Summary

4.1. Distribution of Nocturia Patient Groups

From epidemiological studies, it can be found that although all three age groups, young and middle-aged, are at risk for nocturia, the vast majority of clinical studies focus on treating middle-aged and elderly patients with nocturia, which, in addition to the rising trend of aging of our population and the large elderly population, may be related to the low prevalence and consultation rate of young patients, and therefore needs to be popularized.

4.2. Acupuncture Treatment Modalities

According to the above clinical studies, moxibustion is more frequently used in the choice of treatment modality, which may be related to the characteristics of nocturia, which mostly occurs in patients with kidney Yang deficiency [33]. In the case of moxibustion, there is literature showing the efficacy of treatment methods based on the theory of ziwu-liu-injection. Although the duration of treatment varies, the majority of studies have found that a course of more than two treatments is more effective. Combination therapy for nocturia is better than single method treatment.

4.3. Shortcomings and Prospects of Acupuncture Treatment

Among the many clinical studies on the treatment of nocturia, acupuncture therapy has received widespread attention for its advantages of being economical, practical, safe and effective. However, there are also shortcomings, such as: 1. Few studies that simply study the treatment of nocturia with acupuncture and moxibustion; 2. Most studies of acupuncture and moxibustion characteristic therapies focus on clinical efficacy observation and lack exploration of its related mechanisms; 3. In terms of treatment means, treatment group design generally adds acupuncture treatment to other treatments, which is not able to highlight the advantages of acupuncture treatment, and most clinical observation studies are limited to TCM. The majority of the clinical observation studies were limited to Chinese medicine; 4. There was a lack of prognostic follow-up studies on nocturia after acupuncture treatment.

In the future, we should further develop ideas, improve the quality of research and clinical efficacy, and further explore the pathogenesis and treatment of the disease is the general trend of clinical research on nocturia.

References

- [1] Wang Jianye, Liao Limin, Xu Kexin, et al. Chinese expert consensus on clinical diagnosis and treatment of nocturia. *Chinese Journal of Urology*, 2018, 39(8): 561-564.
- [2] Re: Trends and Prevalence of Nocturia Among Us Adults, 2005-2016.. *The Journal of Urology*, 2020.
- [3] Poming C, Yaochi C, Po HKC, et al. Impacts of Nocturia on Quality of Life, Mental Health, Work Limitation, and Health Care Seeking in China, Taiwan and South Korea (Iuts Asia): Results From a Cross-sectional, Population-based Study.. *Journal of the Formosan Medical Association = Taiwan Yi Zhi*, 2021, 121(1).
- [4] Bosch JR, Weiss JP. The Prevalence and Causes of Nocturia. *The Journal of Urology*, 2013, 189(1).
- [5] Zhang Zhenwei. Survey on the prevalence and risk factors of nocturia in 14000 young people. *Xinxiang Medical College*, 2021.
- [6] Hang CEP, Fai WEY, Yan KJY, et al. The Mediating Role of Sleep Quality in the Association Between Nocturia and Health-related Quality of Life.. *Health and Quality of Life Outcomes*, 2019, 17(1).
- [7] Freedland S. Mp04-15 Nocturia Is Associated with Increased Risk of Death: Results From Reduce. *The Journal of Urology*, 2018, 199(4).
- [8] Birder LA, Kerrebroeck PEV. Pathophysiological Mechanisms of Nocturia and Nocturnal Polyuria: the Contribution of Cellular Function, the Urinary Bladder Urothelium, and Circadian Rhythm. *Urology*, 2019, 133(Supl.).
- [9] Mitsuru O, Takuro K, Koji H, et al. Hypertension, Cardiovascular Disease, and Nocturia: a Systematic Review of the Pathophysiological Mechanisms.. *Hypertension Research: Official Journal of the Japanese Society of Hypertension*, 2021, 44(7).
- [10] Negoro H, Fukunaga A, Kawaguchi T, et al. Medical History of Nocturnal Enuresis at School Age Is a Risk Factor for Nocturia in Adults: the Nagahama Study. *European Urology Supplements*, 2019, 18(1).
- [11] Li K, Li S, Tang S, et al. Advances in the pharmacological treatment of nocturia. *Continuing Medical Education*, 2019, 33(6): 140-142.
- [12] Olesen T, Paul J, Gramme P, et al. Assessment of the Most Impactful Combination of Factors Associated with Nocturia and to Define Nocturnal Polyuria By Multivariate Modelling. *Journal of Clinical Medicine*, 2020, 9(7).
- [13] Qian Docheng, Wu Denglong. Advances in research and treatment of nocturia. *Surgical Research and New Technology*, 2017, 6(3): 198-202.

- [14] Li K, Li S, Tang S, et al. Advances in the pharmacological treatment of nocturia. *Continuing Medical Education*, 2019, 33(6): 140-142.
- [15] Gao Y, Guo ZA. Chinese medicine etiology and treatment of nocturia. *Chinese Journal of Integrated Chinese and Western Medicine and Nephrology*, 2019, 20(12): 1119-1120.
- [16] Wang Jianhua, Wang Chengjian. Wang Chengjian's experience in the treatment of nocturnal polyuria with self-prepared Stop Urination San. *Modern Chinese medicine*, 2017, 37(2): 8-9.
- [17] Ma Xiangli. 45 cases of geriatric nocturia treated with parietal midline with urinary triple acupuncture. *Hunan Journal of Traditional Chinese Medicine*, 2017, 33(1): 74-76.
- [18] Duan S.D., Zhou Huanjiao, Wu Song. 45 cases of nocturia in the elderly treated with Dong's odd points. *Liaoning Journal of Traditional Chinese Medicine*, 2016, 43(2): 331-332.
- [19] Tan YQ, Liu RF, Xu Z, et al. Clinical efficacy of waking the brain and fixing acupuncture method for the treatment of nocturia of sleep disorders. *World Journal of Sleep Medicine*, 2019, 6(2): 171-172.
- [20] Zhao Junfei. Clinical study of acupuncture with auricular acupressure in the treatment of senile nocturia. *Changchun University of Traditional Chinese Medicine*, 2021.
- [21] Han LH, Liu L, Li YH, et al. Observation on the care of geriatric nocturia with kidney yang deficiency type by ziwu-liu-injection selective gentle moxibustion. *Yunnan Journal of Traditional Chinese Medicine*, 2019, 40(7): 86-87.
- [22] Lei L F, Deng X H. Efficacy of thermosensitive moxibustion in the treatment of nocturia in the elderly. *Chinese Journal of Gerontology*, 2017, 37(4): 963-964.
- [23] Zhang Weiwei, Zhou Jianhui, Deng Lili. A multicenter randomized controlled study of thermal moxibustion to reduce nocturnal urination and improve sleep quality in patients with nocturia. *Journal of Guangzhou University of Traditional Chinese Medicine*, 2021, 38(12): 2646-2651.
- [24] Zhang Qiong Q. Clinical efficacy of diaphoretic moxibustion in the treatment of nocturia in middle-aged and elderly people with kidney yang deficiency. *Shandong University of Traditional Chinese Medicine*, 2020.
- [25] Cui JF, Tan LH, Hao YQ, et al. Clinical study on the treatment of nocturnal enuresis in elderly men with additive shrinking spring dou moxibustion powder pavement moxibustion. *New Chinese Medicine*, 2019, 51(4): 231-233.
- [26] Gong RZ. Warm acupuncture for frequent nocturnal urination in elderly people in 120 cases. *Chinese Acupuncture*, 2013, 33(S1): 89-90.
- [27] Yu L, Fan S N, Wang J L. Treatment of nocturnal enuresis in the elderly with Guan Yuan warm acupuncture. *Inner Mongolia Traditional Chinese Medicine*, 2016, 35(12): 64-65.
- [28] He Q, Zhang QJ. 68 cases of nocturia treated with moxibustion with interspersed saprophytic cakes and salt. *Combined Chinese and Western Medicine Research*, 2019, 11(6): 308-310.
- [29] Feng Houqiao, Feng Lingmei. Clinical experience of abdominal acupuncture with box moxibustion in 20 cases of nocturnal urinary frequency in elderly men. *Clinical Research in Chinese Medicine*, 2012, 4(11): 31-32.
- [30] Zhou Jiajia. The efficacy of thermal moxibustion combined with abdominal acupuncture in the treatment of nocturia in the elderly. *Guangming TCM*, 2017, 32(9): 1321-1323.
- [31] WANG Xinhua, HUANG Fang, ZHAO Yan. The efficacy of acupuncture and moxibustion in the treatment of nocturia in the elderly. *The efficacy of acupuncture and moxibustion in the treatment of nocturia in the elderly*.
- [32] Zhang Andong. Study on the myogenic mechanism of acupuncture based on the pacing function of bladder ICCs to regulate the overactivity of the detrusor muscle. *Shanghai University of Traditional Chinese Medicine*, 2019.
- [33] Fu Yunsheng. Study on the rat model of nocturia in subhealthy kidney Yang deficiency. *Zunyi Medical University*, 2019.