

Clinical Observation on Distribution Characteristics and Rules of Force-Sensitive Acupoints in Patients with Benign Prostatic Hyperplasia

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Abstract: Based on the theory of acupoint sensitization, the aim of this study is to explore the distribution of acupoints in patients with benign prostatic hyperplasia (BPH), and to explore its distribution characteristics and rules, in order to provide a new idea and theoretical basis for the selection of acupoints in the clinical treatment of BPH. Results the occurrence rate of force sensitive acupoints in BPH group (82%) was significantly higher than that in healthy group (1%) ($p < 0.001$). The 587 limin acupoints in patients with BPH are highly concentrated in the nerve segments from T10 to S2(69.59%), which are the spinal nerve segments innervating the prostate. (3) the distribution of li-min acupoints shows regularity in meridians, mainly concentrated in the kidney meridian of foot-shaoyin, ki-bl, bladder meridian of foot-taiyang. Specific Point area appears in Guanyuan, Liangqiu, Yaoyangguan, followed by Weizhong, Weishu, Shenshu and so on. Conclusion there is a specific distribution of acupoints on the body surface in patients with BPH, and its occurrence rate is significantly higher than that of healthy people, the distribution pattern is highly consistent with the meridians related to the reproductive system in TCM theory (kidney meridian of foot-shaoyin, ki-bl, bladder meridian of foot-taiyang) and the nerve segments innervating the prostate in modern medicine (T10-S2). This study provides objective clinical evidence for the diagnosis and treatment of BPH from the perspective of "Acupoint sensitization". Exploring these force-sensitive acupoints can be used as an effective target for mechanical stimulation intervention of BPH, such as acupuncture and massage, it provides a new idea for optimizing the clinical treatment scheme.

Keywords: Benign Prostatic Hyperplasia; Acupoint Sensitization; Force-Sensitive Acupoints; Distribution Law; Acupuncture.

1. Introduction

Benign prostatic hyperplasia (BPH) is a disease with high incidence in men over 50 years old, and its core symptoms are frequent urination, nocturnal frequent urination and dysuria. The incidence of benign prostatic hyperplasia (BPH) generally increases with age, and Chinese medicine belongs to the category of "Jinglong".

Acupoints are the places where the Qi of zang-fu and meridians is transported and transported, and they have two different functional states: in physiological state, they are relatively quiet, while in pathological state, they are activated, so as to map the pathological changes of relevant meridians, zang-fu organs and organs, some acupoints are very sensitive to acupuncture, massage and other stimuli, resulting in a strange phenomenon of force sensitization, specific responses such as "Quickness", comfort, or pain relief occur [2], which greatly enhance the efficacy of acupuncture. Acupoint sensitization is an important manifestation of acupoint response diseases. Based on the theory of acupoint sensitization, this study explores the acupoints of patients with benign prostatic hyperplasia and healthy subjects, to explore the distribution characteristics and rules of force-sensitized acupoints for benign prostatic hyperplasia, and try to provide a new idea for acupuncture treatment of benign prostatic hyperplasia.

2. Materials and Methods

The subjects were all from the medical population of the affiliated hospital of Jiangxi University of Traditional

Chinese medicine from April to November 2022, and the BPH patients were from the outpatient and inpatient departments of the Acupuncture Department (Group BPH), healthy subjects were from the physical examination center (for the healthy subjects group), with 100 cases in each group. The age was (60 ± 10) years in the BPH group and (35 ± 10) years in the healthy subjects group. There was no significant difference in age and course of disease between the two groups.

2.1. Diagnostic Criteria

2.1.1. Western Diagnostic Criteria:

Age: 50 + male. Symptoms: presence of lower urinary tract symptoms (Luts), moderate or greater international prostate symptom score (I-PSS), and quality of life affected. 3 signs: in line with the typical manifestations of benign prostatic hyperplasia, that is, prostate volume, texture, smooth surface, central groove shallow or disappear, and did not touch the clear induration. 4 evidence of adjunctive examination: b-ultrasound indicating prostate volume > 30 ml; presence of increased residual urine output and/or decreased urine flow rate; elevated serum prostate-specific antigen (PSA). (refer to clinical guidelines for the diagnosis and treatment of benign prostatic hyperplasia (2007 edition) [3])

2.1.2. TCM Diagnostic Criteria:

(1) Urination is not good, the drip is not free, or the urination is blocked, the urethra has no astringent pain, the lower abdomen is full. (2) More common in elderly men, or postpartum women and patients after surgery. (3) Male rectal digital examination may have benign prostatic hyperplasia, or

bladder area percussive obvious voiced. (4) Cystoscopy, ultrasonography and abdominal x-ray may be helpful for diagnosis.

2.2. The Patients Were Divided into Standard BPH Group:

(1) frequent urination at the beginning, increasing frequency of nocturia, gradually dysuria, dribbling, and in severe cases, anuresis or urinary incontinence; (3) digital rectal examination: the prostate is enlarged, hard, central sulcus, shallow or disappear; (4) ultrasonography: the size of prostate is larger than normal, the residual urine volume (RU) is more than 60 ml, and the maximum urine flow rate (QMAX) is less than 15 ml/s; 5 international prostate symptom score (I-PSS) ≥ 13 . (the criteria refer to the efficacy criteria for the diagnosis of TCM symptoms [4])

2.3. Exclusion Criteria:

(1) prostate cancer, neurogenic bladder, urethral stricture and bladder tumor; (2) prostate surgery; (3) severe heart, lung, liver and kidney diseases. (4) acupuncture, massage or drug treatment within 30 days before observation.

2.4. Rejection and Shedding Criteria:

(1) the subjects were unable to understand or express or could not cooperate with the probe for various reasons; (2) severe adverse reactions, which led to the inability of clinical observation.

2.5. Research Methods

The design of the experiment, in which special persons were responsible for the enrollment, exploration and data processing of subjects. The reporters were fair and objective, and the researchers adhered to the ethical guidelines of the Helsinki Declaration.

2.5.1. Stress-sensitive Acupoint Exploration and Threshold Detection

(1) Environment: Choose the same consulting room, keep the indoor environment quiet, the indoor light is bright, the room temperature is 20-25 °C; (2) Position: The subject is taken from the comfortable position before exploration, fully revealing the area to be examined, and rest for 10 minutes to steady state, and then began to explore; (3) Exploration tools: Finger pulp; (4) Exploration site: In the patient's body surface parts on the press, to avoid private parts; (5) Exploration preparation: In order to ensure the accuracy and standardization of the test, the operators involved in the project received unified training in the method of acupressure exploration and the criteria for judging the pressure-sensitive acupoints before the project was carried out, only after the operator is skilled, can the subject be explored for pressure sensitive acupoints. In the procedure of sensitizing point

detection, the operator fixed one person to avoid the error caused by different operators. (6) Detection method: The operator first used palpation method to test the pressure on the thumb pulp, and compared the "Finger force" intensity of tenderness, then the same pressure intensity is used to expand the exploration range, and the exploration area is focused on but not limited to the acupoints, and the patient's feelings are inquired, record the "Quick" sensitive acupoint area (acupoint area: in the trunk of the human body, the distance between the detected force-sensitive acupoints and the nearest traditional acupoints is no more than 1 inch of the same body; in the limbs of the human body, the distance between the detected force-sensitive acupoints and the nearest traditional acupoints is no more than 0.5 inch of the same body), objectively record the location of the force-sensitive acupoints. (note: the number of limin acupoints is 1 when the "Quick-run" phenomenon of pressing (lifting and pinching) occurs on the same acupoint on both sides or unilateral of the same patient.) (7) Drawing: The statistics of the acupoints of "Quick-run", the size, shape and number of the acupoints are plotted on the human neurocutaneous ganglia.

2.6. Statistical Methods

Excel 2019 software was used to record the distribution and number of clinical sensitive areas of limin acupoints, and descriptive statistical analysis was carried out, and they were marked by diagrams. The data of the identified force-sensitive acupoints were input into SPSS 25.0 statistical software, and the frequency statistics method was used to calculate the occurrence frequency of their meridians, acupoint areas and nerve segments. Two tests were used to compare the counting data, and the difference was statistically significant with $P < 0.05$.

3. Results

3.1. General

General data of BPH patients were compared with those of healthy subjects. There were 100 men in the BPH group, ranging in age from 50 to 70 years, with a mean of (64 ± 9.47) years. There were 100 healthy male subjects, ranging from 25 to 45 years old, with a mean age of (35 ± 6.32) years. There was no significant difference in gender and age between the two groups, but they were comparable.

3.2. Occurrence Rate of Acupoints in Subjects with Stress Sensitivity

The occurrence rate of force-sensitive acupoints was 1% in the healthy group and 82% in the BPH group, which was significantly higher than that in the healthy group ($p < 0.001$). See Table 1.

Table 1. comparison of the frequency of acupoints in patients with BPH and healthy subjects

Groups	Number of cases	Number of occurrences	Occurrence rate	Average number of occurrences
BPH patient group	100	82	82%	0.82
Healthy subjects	100	10	1%	0.1

3.3. Relationship between Acupoint Distribution and Renal Nerve Segments in Patients with BPH

A total of 100 patients with BPH showed 587 acupoints in

82 patients. By analyzing the relationship between limin acupoints and nerve segments, it is found that limin acupoints are mostly distributed in the thoracic T10-T12, Lumbar L1-L5, and sacral S1-S2 (see Figure 2). There were 405 force-sensitive acupoints distributed in the genital nerve segments (T10-S2), accounting for 69.59% of the total force-sensitive

acupoints.

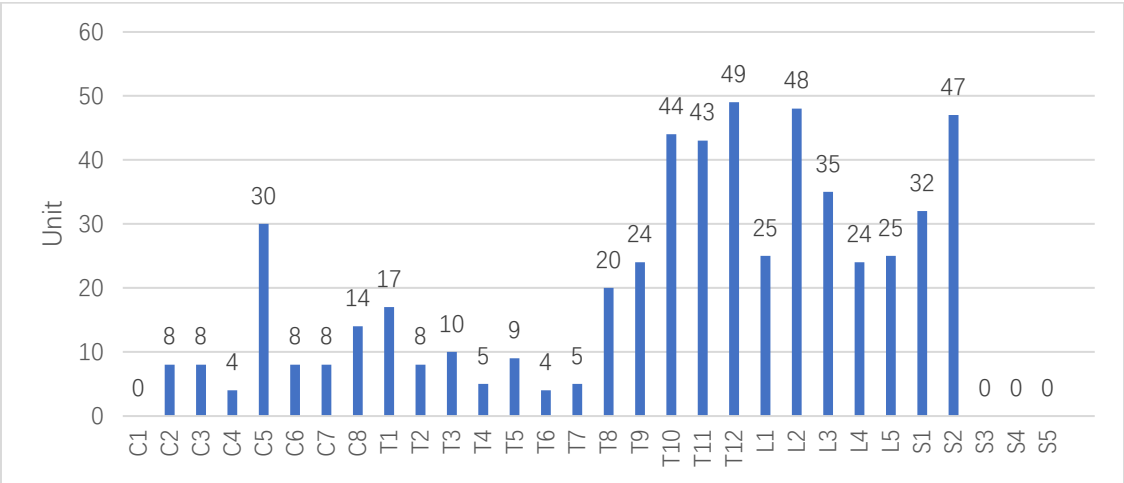


Fig 1. distribution of nerve segments of LIMINIC acupoints in patients with BPH

3.4. Relationship between the Distribution of Limin Acupoints and the Position of Related Meridians

The exploration of the distribution of patients' force-sensitive acupoints shows obvious regularity and specificity,

and the sensitization phenomenon mostly occurs at Guanyuan, Liangqiu and Yaoyangguan, followed by Weizhong, Weishu and Shenshu (see figures 2 and 3). The most frequent meridians are the kidney meridian of foot-shaoyin, ki-bl, bladder meridian of foot-taiyang, which are related to the reproductive system. (see Figure 3)

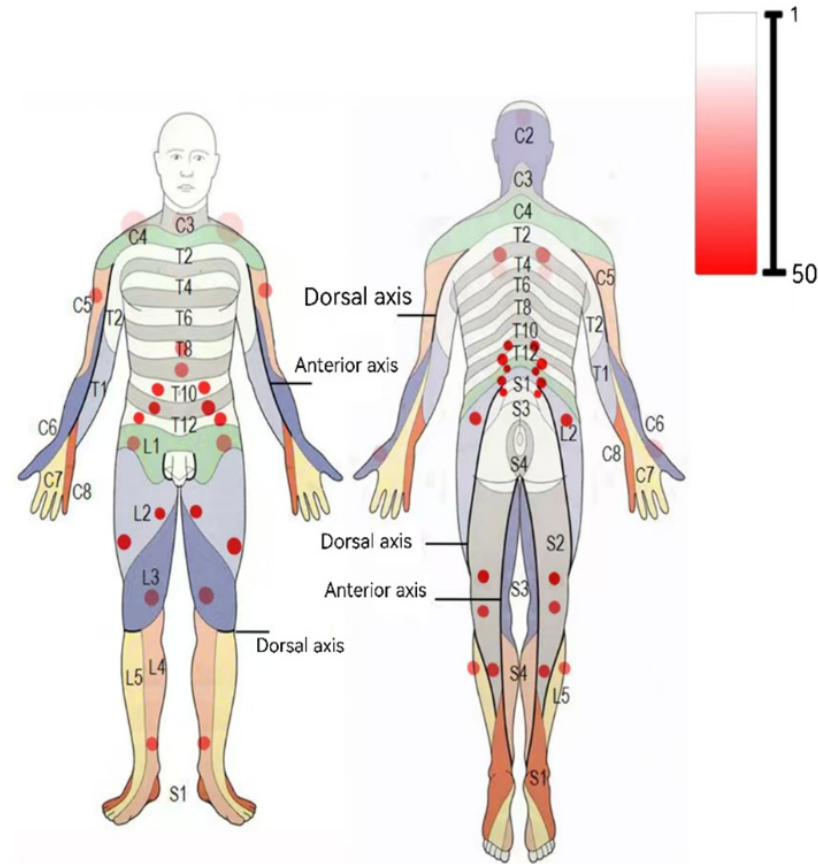


Fig 2. body surface distribution of the first 35 pressure sensitive acupoints in BPH patients

Note: the position of the red dot indicates the detected acupoints. The darker the color, the more the acupoints appear. The size of the red dot represents the area of the acupoints.

4. Discussion

The benign prostatic hyperplasia (BPH) belongs to the category of “Long Bi” in traditional Chinese medicine. The

common clinical syndromes mainly include: 1 Kidney Yin deficiency: it is directly related to the function of kidney meridian of foot-shaoyin, ki. 2 the accumulation of damp-heat is closely related to the unfavorable qi transformation of BL, bladder meridian of foot-taiyang. 3 stagnation of blood stasis type: related to obstructed movement of conception vessel and local Qi and blood. Therefore, the traditional theory holds

that the location of BPH is in the cellular essence (prostate), and the core viscera relationship is kidney and bladder, which

mainly involves the meridian of foot-shaoyin, ki-bl, and the meridian of foot-taiyang.

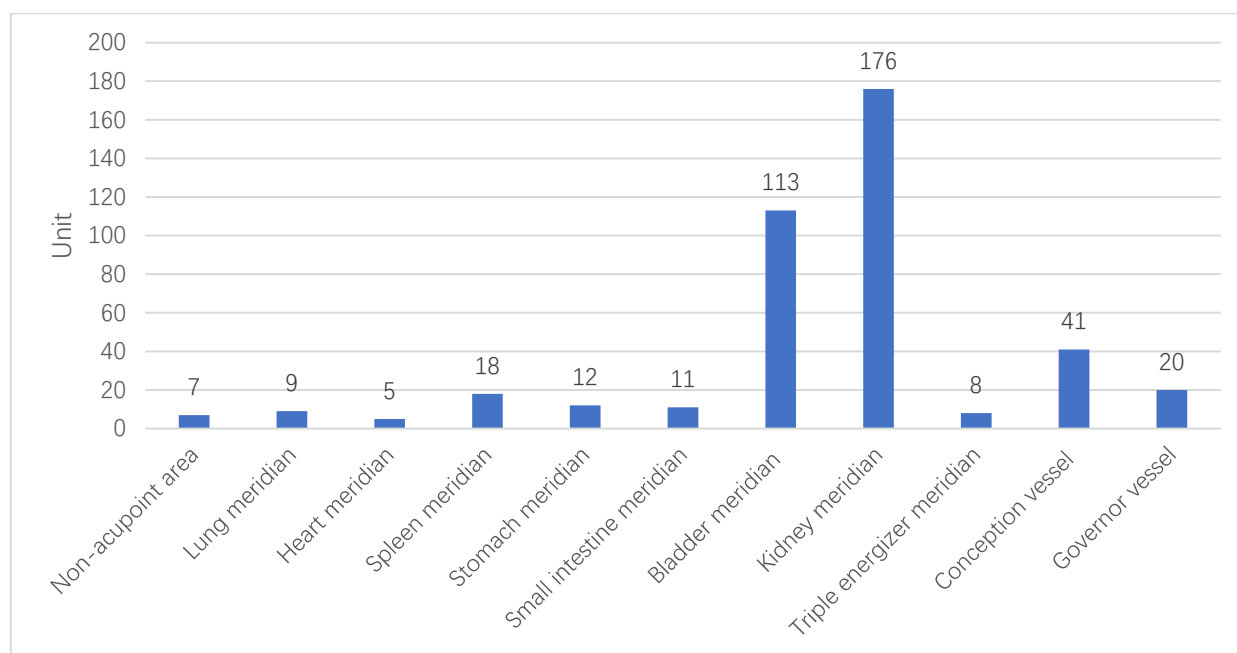


Fig 3. distribution of acupoints on each meridian in patients with BPH

There is a saying in Lingshu bensu: “When the Triple Energizer enters the meridian and the bladder, the lower energizer is about, and the bladder is actually blocked”, which clearly points out that the lower energizer qi transformation is not conducive to Longbi The spirit pivot · Meridians clearly records that “The bladder is full of the Sun's pulse... carrying the spine to the middle of the waist and flowing into the kidneys, which belongs to the bladder”, and it also says that “The kidney is full of Shaoyin's pulse... carrying the spine belongs to the kidneys, which belongs to the bladder”. The bladder meridian of foot-taiyang (BL) and kidney meridian of foot-shaoyin (ki) are the exterior and interior phases, which run deep into the lumbosacral region and are directly related to the kidney and bladder. The prostate is located in the lower jiao, and its function is governed by the kidney and closely related to the bladder. Therefore, the distribution of stress-sensitive acupoints related to benign prostatic hyperplasia has a significant correlation with the distribution of bladder meridian and kidney meridian In this study, it was found that through body surface exploration, the limin acupoints of BPH patients are highly concentrated in the lumbosacral and lower abdominal regions, with a high occurrence rate in guanyuan, liangqiu, Yaoyangguan and other acupoint areas, followed by Weizhong, Weishu, Shenshu and other acupoint areas, these acupoints are exactly where the kidney meridian of foot-shaoyin, ki-bl, bladder meridian of foot-taiyang and conception vessel pass through. The results are highly consistent with the theory, which provides objective evidence for the theory from the perspective of modern acupoint sensitization.

The acupoints play an important guiding role in acupuncture and moxibustion treatment by evaluating the physiological function of the zang-fu organs of patients, professor Chen Rixin of Jiangxi University of traditional Chinese medicine pointed out that acupoints are distributed on the body surface, individualized, dynamic and sensitized, its theoretical origin can be traced back to “Taking pain as loss” put forward in Lingshu Jingjin. Modern studies have shown

that a series of neurogenic reactions can occur in the local tissues of relevant acupoints under the disease state, including pain threshold reduction, skin temperature change and neurogenic inflammation. For example, Zhou Yanli et al. [8] Acupuncture Neiguan, Sanyinjiao, Zusanli and other acupoints can increase the number of GABA, GABAAR positive cells in the brain of insomnia rats, to achieve the purpose of treating insomnia. Other studies [9] have pointed out that sensitized acupoints have multiple properties of reflecting pathological conditions and treating diseases, which reflects the force sensitization characteristics of “According to its location, should be in the middle and pain relief” in Neijing, it is pointed out that “Quickness” is a necessary feature of effective acupuncture treatment. The nerve segment of the spinal cord innervating the prostate is mainly located at the T10-S 2 level. This exploration of the body surface of BPH patients can find that the acupoints in this nerve segment area overlap with the sensitized acupoints that the patients feel “Quick”. Therefore, it can be seen that in the state of disease, the acupoints change from “Resting state” to “Active state” and become a dynamic sensitization site distributed on the body surface, the distribution of acupoints is determined by the relevant zang-fu organs and their innervating nerve segments.

In Lingshu Beiyu, it is pointed out that “If you want to find it out, you should interpret it painfully in the middle, which is the acupoint.” This shows that ancient books have long clarified that the reaction point of visceral lesions on the body surface is not completely fixed, but need to be determined by pressing to explore its dynamic sensitization. In this study, based on ancient books and modern frontier acupuncture theory, combined with clinical observation, the distribution characteristics and rules of pressure-sensitive acupoints of BHP patients are deduced, this discovery provides valuable guidance and theoretical support for the selection of acupoints for the Prevention and treatment of BPH by acupuncture, massage and other mechanical stimulation, and promotes the optimization and innovation of acupuncture in the prevention

and treatment of diseases.

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References

- [1] Wan Min, Zhou Yumei, Zhou Jie, etc.. Analysis on the phenomenon and law of acupoint sensitization [J]. Clinical Journal of acupuncture and moxibustion, 2017,33(3): 74-77.
- [2] Cao Qian'an, Fu Yong, Xiong Jun, etc.. Clinical study on distribution of stress-sensitive acupoints in chronic Atrophic gastritis patients [J]. Acupuncture studies, 2019,44(5): 373.
- [3] Zhang Xianghua, Wang Xinghuan, Wang Gang, et al.. Clinical guidelines for the diagnosis and treatment of Benign prostatic hyperplasia [J]. Chin J surgery, 2007,45(24): 1704-1707.
- [4] The State Administration of Traditional Chinese Medicine. Diagnostic efficacy standard of traditional Chinese medicine [s] . Nanjing: Nanjing University Press, 1994:30 -31.
- [5] Li Hui. Declaration of Helsinki [J] -RSB-DeclarationHelsinkiinki. Introduction to Japanese medicine, 2005 (8): 381-382.
- [6] Tae-wah, Liu Xiang. Spirit pivot meridian [m]. People's Medical Publishing House: 201707:122.
- [7] Chan Yat-sen, Kovrig. Moxibustion is essential for Qi to reach and is effective [J]. Chinese acupuncture, 2008,28(1): 44-46.
- [8] Zhou Yanli, Gao Xiyan, Wang Yuyu, et al.. Effect of acupuncture at different acupoints on hypothalamic GABA and GABA a receptor in insomnia rats [J]. Acupuncture research, 2012, 37(04): 302-307. DOI: 10.13702/J. 1000-0607.2012. 04. 010.
- [9] Fu Yong, Cao Qian'an, Zhang Haifeng, et al.. Discussion on“Kuairan” characteristics of sensitized acupoints based on internal classic theory [J]. Acta Jiangxi University of Traditional Chinese Medicine, 2020,32(04): 9-11. DOI: Cnki: Sun: xyxb.0.2020-04-003.