

Study of the relationship between acupuncture dose and effect

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Acupuncture dose–effect relationship is the essential feature of acupuncture and the key factor of acupuncture’s therapeutic effect. It is a comprehensive category, including needle direction, needle strength, needle depth, selection of specific techniques, length of time between acupuncture treatment sessions, length of needle retention time, and frequency of treatment, all of which play a decisive role in the curative effect and prognosis of diseases^[1].

1 Historical evolution of the relationship between acupuncture dose and effect

A lot of diseases and syndromes in the *Inner Canon of Huangdi* (*Huáng Dì Nèi Jīng*) are mainly treated by acupuncture. There are detailed records on the relationship between acupuncture depth, manipulation, needle retaining time, *de qi*, treatment frequency, and curative effect in the relationship between acupuncture dosage and effect. Since then, clinicians have focused on the above points in the development of the acupuncture dose–effect relationship.

1.1 Relationship between acupuncture depth and curative effect

In the *Inner Canon of Huangdi*, the depth of acupuncture is regarded as the key factor influencing the effect of acupuncture, and certain principles are followed^[2]. The depth of acupuncture is also discussed in *Classic on Medical Problems* (*Nàn Jīng*) (Table 1).

1.2 The relationship between acupuncture manipulation and curative effect

The implementation of acupuncture manipulation is the key step of acupuncture treatment. Different acupuncture manipulation will inevitably produce different stimulation intensities and different degrees of stimulation will

produce different acupuncture effects. Ancient physicians conducted simple quantitative analyses of acupuncture manipulation, some of which are described in Table 2.

1.3 The relationship between needle retention time and curative effect

Needle retention time is another important factor in the acupuncture effect. Medical books such as *Inner Canon of Huangdi* suggest that needle retention time should be considered from the aspects of patients’ constitution, viscera, meridians, etc^[12], as shown in Table 3.

1.4 Relationship between *de qi* and curative effect

Ancient doctors regarded “*qi* arrival” or “*de qi*” as the judgment for the standard of “minimum effective stimulation amount.” Achievement of *de qi* or lack of *de qi* is the most accurate judgment of the therapeutic effect of acupuncture stimulation amount. Therefore, “*de qi*” is closely related to acupuncture curative effect^[14]. Doctors of all dynasties attach great importance to it, as shown in Table 4.

1.5 The relationship between treatment frequency and curative effect

It has been suggested in the *Inner Canon of Huangdi* that the appropriate frequency of acupuncture treatments varies among different diseases. For example, *Simple Questions* (*Sù Wèn*) states^[15], “The wind evil invades the human body, and the symptoms of cold or heat appear. If the symptoms are hot, sweating occurs. If the symptoms occur several times a day, you should first acupuncture the muscle and collaterals. If the symptoms are still cold or hot, you can acupuncture once every 3 d, and the disease will be cured after 100 d of treatment. The cause of the disease is gale attack, with heavy joints, beard, and eyebrow falling off. The disease is called gale. Acupuncture should be applied to the muscles to make them sweat. After 100 d of continuous treatment, acupuncture should be applied to the bone marrow to make them sweat. The treatment should also be applied for 100 d, with a total of 200 d. Acupuncture can be stopped until the beard and eyebrows grow again.”

Ancient acupuncture scholars attached great importance to the amount of acupuncture treatment. However, because ancient Chinese medicine was passed on by teachers or families, the language and demonstration teaching was more comprehensive than that of written words. The differences between ancient and modern Chinese medicine and a variety of acupuncture reinforcing and reducing techniques entailed virtually no standardized quantitative provisions. The description of the

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Table 1**Relationship between acupuncture depth and curative effect in ancient medical books.**

Literature	Content	Remarks
<i>Inner Canon of Huangdi</i>	There are differences between diseases on the surface and in the interior. The needling methods differ between shallow needling and deep needling. Diseases on the surface should be treated with shallow needling, diseases in the interior should be treated with deep needling, and each should reach a certain part (where the disease is located), but no deeper than necessary. If the puncture is too deep, the internal organs will be damaged; if the puncture is too shallow, not only will it not reach the diseased area but also, the <i>qi</i> and blood on the surface will be blocked, giving the diseased pathogen an advantageous opportunity. Therefore, the improper depth of acupuncture can cause great harm to the human body, cause disorder of the five organs' function, and serious diseases ^[3] .	Improper acupuncture depth can cause medical injury.
<i>Inner Canon of Huangdi</i>	If a needle stabs the bone, it will not hurt the tendon; if a needle stabs the tendon, it will not hurt the muscle; if a needle stabs the muscle, it will not hurt the pulse; if a needle stabs the pulse, it will not hurt the skin..... ^[3]	Only reasonable depth can achieve a good curative effect.
<i>Classic on Medical Problems</i>	When reinforcing, <i>qi</i> should be drawn from the <i>wei</i> ; when reducing, <i>qi</i> should be drawn from the <i>ying</i> ^[4] .	The reinforcing method entails approaching deeper regions with the needle from more shallow depths, taking the <i>qi</i> from the <i>wei fen</i> , and pushing it into the interior slowly; the reducing method entails inserting the needle into the deep of the <i>ying fen</i> , and gradually lead the evil <i>qi</i> out from the deep to shallow tissue.
<i>Classic on Medical Problems</i>	Stabbing <i>rong</i> does not hurt <i>wei</i> , stabbing <i>wei</i> does not hurt <i>rong</i> ^[4] .	—————
<i>Wuwei Medical Bamboo Slips of the Han Dynasty (Wu Wei Han Dai Yi Jian)</i>	Then, the needle punctures 5 inch below the knee, 10.00 mm deep, leave the needle as if cooking a liter of rice. The needle is called Sanli (ST36).	The earliest record on the depth of acupuncture at a certain point ^[5] . It is clearly indicated that the "Sanli (ST36)" point depth is 10.00 mm in the <i>rong</i> . " <i>rong</i> " and " <i>ying</i> " have the same meaning. The so-called " <i>ying</i> " and " <i>wei</i> " also represent the depth of acupuncture.
<i>A-B Classic of Acupuncture and Moxibustion (Zhen Jiu Jiā Yī Jīng)</i>	Piercing into Hegu (LI4) 10.00 mm ^[6] , piercing into Huantiao (GB30) 33.33 mm ^[6] .	Volume 3 of <i>A-B Classic of Acupuncture and Moxibustion</i> written by Mi Huangfu of the Jin Dynasty, elaborates the acupuncture depth of 342 of 349 acupoints, respectively. Although the acupuncture depth of some acupoints was revised by later physicians, the book of <i>A-B Classic of Acupuncture and Moxibustion</i> has undoubtedly made an important contribution to the standardization and quantification of acupuncture at that time.
<i>Compendium of Acupuncture and Moxibustion (Zhen Jiu Dà Chéng)</i>	People acquire diseases; there are therapeutic variations between cold before heat, heat before cold. Clinicians using treatment methods should pay attention to the difference between different orders of different treatments, and previous treatment. If we are not aware of similarities and differences between current and past treatments, we cannot understand patterns. What else can we rely on to achieve the treatment according to the disease ^[7] ?	To summarize, during treatment, the depth of acupuncture should be modified according to the patient's specific situation of cold and heat, and deficiency and excess ^[8] .
<i>Inner Canon of Huangdi</i>	In spring, the vital energy of the human body lies in the hair on the body surface, in summer in the skin layer, in autumn in the space between muscles, and in winter in the tendon and bone layer. Acupuncture treatment for the same disease must be based on the depth of <i>qi</i> in the body at each of the four seasons, and the depth of acupuncture should be consistent with the season ^[9] .	The depth of acupuncture is also closely related to seasons.

(continued)

Table 1
(continued).

Literature	Content	Remarks
<i>Acupuncture Guide (Zhēn Jiǔ Zhī Nán)</i>	Spring and summer are <i>yang</i> . Its <i>qi</i> is outside, and its popularity is also floating. Those who needle should insert shallowly. Autumn and winter are <i>yin</i> . The <i>qi</i> is inside, and the <i>qi</i> is in the viscera. Those who needle should insert deeply ^[10] .	—
<i>Inner Canon of Huangdi</i>	For <i>yin</i> and <i>yang</i> of the hand, the way of receiving <i>qi</i> is close, and the source of <i>qi</i> is quick. The depth of acupuncture is not more than 6.67 mm ^[9] .	The depth of needling is also related to the selected meridians. The hand meridians acquire <i>qi</i> quickly, so needling should be shallow.

appropriate number of acupuncture treatments was too general and vague and was not scientifically operationalized. The lack of standardization and accuracy makes it difficult for later scholars to understand correctly. The principles of reinforcing and reducing remain in doubt, which limits the ongoing development of acupuncture techniques. This requires modern acupuncture researchers to deeply explore the classical theory and further quantify the parameters of acupuncture treatment amount.

2 Proposal and development of acupuncture manipulation metrology

Since the 1970s, I have studied more than 10 kinds of diseases with remarkable effects by acupuncture and moxibustion. Many diseases have been studied using manual metrology, including a prescription for acupuncture, acupoint positioning, acupuncture direction and depth, selection of manual and operation time, acupuncture interval time, and other parameters. Analyses of

Table 2
Relationship between acupuncture manipulation and curative effect discussed in ancient medical books.

Literature	Content	Remarks
<i>Inner Canon of Huangdi</i>	Slowly insert the needle and hand-manipulate the needle, quickly remove the needle and press the needle hole tightly, this is the complement. The needle should be inserted quickly and removed slowly without closing the needle hole ^[11] .	If the evil <i>qi</i> is strong, the needle should be inserted quickly and removed slowly. The stimulation amount should be “heavy,” and the needle hole should be enlarged to eliminate entry of evil <i>qi</i> . The complement law indicates that the needle should be inserted slowly and removed quickly. The stimulation degree should be “light,” and the needle hole should be closed to prevent the healthy <i>qi</i> from leaking out and the evil <i>qi</i> from entering ^[11] .
<i>Inner Canon of Huangdi</i>	The reducing method should adopt a round and fluent technique, directly stab the region of illness and turn the needle, so that the healthy <i>qi</i> can be operated. During the operation, the needle should be inserted quickly and removed slowly to induce evil <i>qi</i> to exit. When the needle is inserted, the direction of the needle tip should be in the direction of the meridian <i>qi</i> . When the needle is removed, the needle hole should be widened, and the evil <i>qi</i> will leak out quickly. For complement therapy, it is necessary to adopt a correct and calm technique. First, massage the skin to relax the patient and observe the acupoints. Gently twist the needle and slowly insert it. When inserting the needle, the body must be upright. The person inserting the needle should remain calm and wait for the arrival of <i>qi</i> patiently and persistently. After the arrival of <i>qi</i> , the needle should be maintained in the current position. When the meridian <i>qi</i> is unobstructed, the needle should be quickly removed. Then, the practitioner should knead and press on the skin of the acupoint to make the needle hole close quickly, so that the real <i>qi</i> can be stored inside and not leak out ^[9] .	—
<i>Biaoyou Fu (Biǎo Yōu Fù)</i>	During a full moon, there is no remedy, during a new moon, there is no reduction.	According to the phase of the moon, the corresponding reinforcing and reducing methods are adopted, the excess is not replenished and the deficiency is not reduced.

Table 3
Relationship between needle retention time and curative effect in ancient medical books.

Literature	Content	Remarks
<i>Inner Canon of Huangdi</i>	In the prime of life, people with a strong physique have sufficient blood gas and strong skin. They are sick because of external pathogens. Acupuncture should be deep and needles retained. This is the method of acupuncture for the treatment of obese individuals. Thin people display thin skin, lack of blood color, thin muscles, thin lips, and soft voices. Their serum is thin and smooth, and their <i>qi</i> is easily collapsed and their blood is easily lost. Acupuncture for this kind of person should be shallow and quick ^[9] .	The length of needle retention is different with different constitutions.
<i>Inner Canon of Huangdi</i>	When puncturing the <i>yin</i> meridian, deep needling and retained needling should be performed; when puncturing the <i>yang</i> meridian, shallow needling and quick removal should be performed ^[9] .	It is better to keep the needle in place for a long time for the visceral diseases of <i>yin</i> and for a short time for the visceral diseases of <i>yang</i> .
<i>Inner Canon of Huangdi</i>	Puncturing the foot <i>yangming</i> meridian should be deep at 20.00 mm, retain needle position for ten breaths; puncturing foot <i>taiyang</i> meridian deep 16.67 mm, retain needle position for seven breaths; puncturing foot <i>shaoyang</i> meridian deep 13.33 mm, retain needle position at 16.67 mm; puncturing foot <i>taiyin</i> meridian deep 10.00 mm, retain needle position for four breaths; puncturing foot <i>shaoyin</i> meridian deep 6.67 mm, retain needle position for three breaths; puncturing foot <i>jueyin</i> meridian deep 3.33 mm, retain needle position for two breaths. In the meridian of the hand, the way of receiving <i>qi</i> is close, and the coming of <i>qi</i> is quick. The depth of acupuncture should not be more than 6.67 mm, and the time for needle retention should not be more than one breath ^[9] .	When needling different meridians, the time of retaining needles should be selected according to the corresponding breath.
<i>Compendium of Acupuncture and Moxibustion</i>	The acupuncture of hand meridians can stop at 24 breaths in spring and summer, and the acupuncture of foot meridians can stop at 36 breaths in autumn and winter ^[13] .	——

Table 4
Relationship between *de qi* and curative effect in ancient medical books.

Literature	Content	Remarks
<i>Inner Canon of Huangdi</i>	The key to effective acupuncture is when <i>qi</i> arrives ^[9] .	The symbolic significance of <i>de qi</i> .
<i>Inner Canon of Huangdi</i>	When breathing in, twist the needle to acquire <i>qi</i> ^[15] .	——
<i>Inner Canon of Huangdi</i>	The basic principle of acupuncture treatment is to achieve the harmony of <i>yin</i> and <i>yang</i> and then stop acupuncture ^[9] .	——
<i>Classic on Medical Problems</i>	In spring and summer, <i>yin qi</i> (one <i>yin</i>) is drawn from the deep (liver and kidney), while in autumn and winter, <i>yang qi</i> (one <i>yang</i>) is drawn from the shallow (heart and lung) ^[4] .	It is emphasized that the reinforcing and reducing operation by “pushing in and reinforcing” or “moving and extending and reducing” can be conducted only after acquiring <i>qi</i> .
<i>Classic on Medical Problems</i>	The so-called “reality and emptiness” refer to the firmness or softness of the feeling under the needle. When reinforcing the emptiness, the feeling of firmness and firmness under the needle indicates the acquisition of <i>qi</i> ; when reducing the emptiness, the feeling of softness and emptiness under the needle indicates the loss of <i>qi</i> , allowing clinicians to determine the acquisition or loss of <i>qi</i> ^[4] .	Later clinicians’ understanding of the subjective feeling when acquiring <i>qi</i> under the needle was first eluded to in this article and this kind of feeling under the needle is regarded as the symbol of acquiring <i>qi</i> ^[16] .
<i>Biaoyou Fu</i>	The sensation of lightness, weakness, and slowness under the needle indicates that <i>qi</i> has not arrived, while the feeling of sinking, astringency, and tightness under the needle indicates that <i>qi</i> has arrived. When the <i>qi</i> reaches the point of needling sensation, the cold syndrome should be considered for the retention technique and the hot syndrome should be considered for quick removal of the needle. When <i>qi</i> does not arrive, we should wait for <i>qi</i> according to the patient’s deficiency and excess. If <i>qi</i> arrives, the clinician will experience a sensation in their hands like a fish swallowing hooked bait and floating. If <i>qi</i> does not arrive, the clinician will experience a feeling of vast emptiness ^[17] .	This describes in detail the sensation in the doctor’s hands when <i>qi</i> arrives.

Table 5
Four elements of acupuncture manipulation metrology.

Essential factor	Operation points
Force direction (Figure 1)	The direction of the force is one of the important factors to determine to reinforce and reducing techniques, which is the first definition of twisting reinforcing and reducing manipulation. The 12 meridians are centered on the <i>ren</i> and <i>du</i> meridians. When the thumbs of both hands begin to twist, the direction of force tangent is taken as the standard. The clinician adopts a position facing the patient. The direction of centripetal force is defined as a tonic, and centrifugal is defined as cathartic. That is to say, the left twist direction is clockwise (relative to the patient), and the right twist direction is anticlockwise for compensation. The specific operation is to apply force when twisting and return naturally when reversing. One twist and one turn are continuous.
Force magnitude	The twirling reducing method is the opposite of the tonifying method. The starting direction of the force is centrifugal on both sides, that is, the left side is counter-clockwise and the right side is clockwise. Twirling reinforcing and reducing are directly related to the force, which is the second definition of twirling reinforcing and reducing. When twirling, applying low amplitude and high frequency, the limit is 1/2 turn and the frequency is 120 times per minute or more. When twirling, applying high amplitude and low frequency, the limit is more than one turn, and the frequency is 50–60 times per minute. During the implementation of the tonic method, the operator twists his fingers gently and then returns naturally to form a rhythmic twirling frequency to stimulate the meridian <i>qi</i> slowly. When performing the cathartic method, the operator's fingers, wrists, and entire arm coordinate with each other, and the force is greater, which can quickly stimulate the meridian <i>qi</i> , to achieve the purpose of <i>qi</i> for the disease.
Operative time	The best parameter for the duration of twirling reinforcing reducing manipulation is 1–3 min per acupoint. This parameter is recommended based on a comparison and study of 361 points and more than 50 points of extra meridian acupoints.
Interval between two acupuncture treatments	The optimal parameter for the interval between two treatments is 3–6 h. To determine the accumulated time of the effective effect of acupuncture, more than 50 types of diseases were studied and the optimal parameters for the duration of each acupoint in the treatment of different diseases were recommended.

accumulated data have revealed some regular operation methods and techniques, laying the foundation for quantitative, standardization research. Based on an in-depth study of ancient medical books, with the assistance of modern scientific means, I put forward the theory of acupuncture manipulation metrology firstly. The objective of acupuncture manipulation metrology is to determine and assess the optimal therapeutic dose of acupuncture. This represents the first attempt to scientifically define the four elements of acupuncture manipulation: the direction of acupuncture force, the size of acupuncture force, the operation time, and the interval between two acupuncture sessions. The purpose of this approach is to make acupuncture therapy more normative, repeatable, and operable, to raise the acupuncture treatment from the currently qualitative reinforcing and reducing techniques to the quantitative level^[18]. The four elements of acupuncture manipulation are shown in Table 5.

Clinically, measurement should be determined according to the above four factors of acupuncture stimulation. Of course, there are great individual differences in the intensity of the stimulation received by the body, which should be adjusted according to the patient's physique, weight, and other factors. The depth of acupuncture is another important parameter determining the degree of acupuncture stimulation, which is clinically important.

Since the theory of acupuncture manipulation was first suggested, experimental evidence has indicated that acupuncture manipulation has a direct impact on clinical efficacy. Different acupuncture manipulations can produce various degrees of stimulation and a variety of

acupuncture effects. If the appropriate degree of stimulation cannot be correctly mastered, it is difficult to achieve the expected therapeutic effect^[1].

More recently, in the National Basic Research Program (973 Program) "the dose–effect relationship and biological mechanism of acupuncture manipulation" has been conducted to further study the dose–effect relationship of acupuncture. This project considers the most common diseases treated with acupuncture as the independent variable and selects the established treatment modes that have been proven effective in clinical practice (including clear and quantitative operation specifications and effective meridians and acupoints) to explore the influence of acupuncture treatment frequency on the acupuncture efficacy and its internal mechanism. Previous research indicates that there is a relationship between acupuncture dose and effect, and there is an optimal combination of acupuncture manipulations that can maximize the acupuncture effect. The key factor affecting the relationship between acupuncture dose and effect is interaction, which indicates that the complex combination of manipulations is of great significance to the acupuncture effect. This further proves that the choice of the therapeutic dose of acupuncture will affect the results of acupuncture research^[19–24]. After years of research, acupuncture manipulation is now widely used in the treatment of stroke, coronary heart disease, Takayasu's arteritis, and other diseases. This qualitative leap in acupuncture treatment from qualitative to quantitative fills the gap in the developmental history of acupuncture, makes an important step to move clinical research of

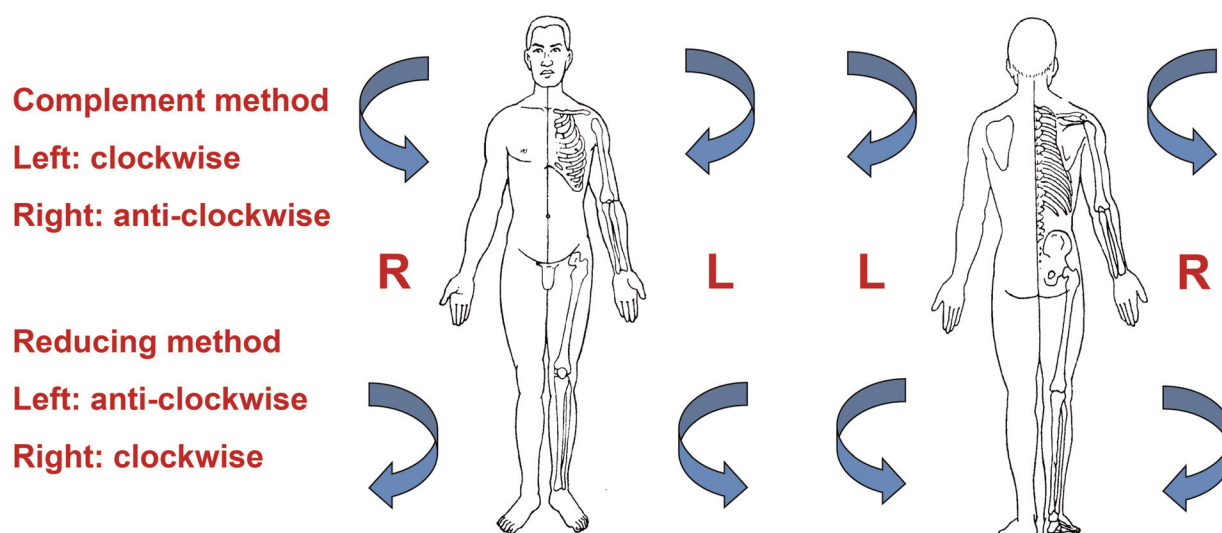


Figure 1. Force direction in acupuncture manipulation metrology. R, right; L, left.

acupuncture into experimental medicine, and improves the clinical summary, scientific research, and dissemination of information regarding acupuncture.

At present, the concept of acupuncture manipulation metrology has evolved into a comprehensive category including acupuncture time, frequency, direction, strength, amplitude, depth, and many other factors^[25–27]. The introduction of acupuncture manipulation metrology has greatly improved the repeatability and scientific nature of acupuncture research, formed a common language for international academic exchange, and further promoted the spread of acupuncture worldwide.

3 Problems and prospects

Acupuncture manipulation metrology occupies an important strategic position in the development of the acupuncture discipline. Taking the “Xingnao Kaiqiao” acupuncture method as an example, the reason for its effectiveness as a treatment for cerebrovascular disease (objectively speaking, its clinical effect is not limited to this) can be made known worldwide. Tracing its origin, it is obvious that it is precise because of its clear acupuncture manipulation metrology parameters this method is easy to teach and to disseminate. It has good operability and repeatability. Over the past decades, numerous clinicians across China and worldwide have been trained in this methodology, it has benefited countless patients, and produced good social and economic benefits. It has contributed to the acceptance of traditional Chinese medicine abroad and its improved global reputation. Additionally, with a clear acupuncture manipulation quantitative operation system, the superior curative effects of acupuncture have been continuously verified by my peers in China and abroad. Additionally, acupuncture manipulation metrology has vastly increased cooperation between world-famous scientific research institutes and the acupuncture academic team led by our institute in both clinical and basic research. The relevant research achievements have received positive feedback from the clinical, medical, and teaching departments. The research has formed a positive cycle and continuously improved the

comprehensive strength of acupuncture and moxibustion. Acupuncture manipulation metrology plays an important role in this process. Only by building a clear system of metrology parameters can the effective acupuncture therapy recorded in ancient books and clinical practice be popularized, and then benefit people’s livelihood. In other words, attaching importance to metrology and “precision medicine” is not only applicable to acupuncture and moxibustion but also crucial to the development of the whole discipline of traditional Chinese medicine. My personal research on the “Danqi hemiplegia capsule” has been unanimously recognized by experts in China and abroad. Progress in metrology is also a result of attention paid to the dose–effect link when cooperating with a number of international and domestic research institutions^[28–29]. Therefore, focusing on metrology is the key to the development of the broader field of traditional Chinese medicine in the future.

At present, the research on the acupuncture dose–effect relationship has made appreciable progress, which also has a profound impact on the clinical and scientific research on acupuncture, but issues related to this research warrant attention.

The first issue is that of the subjective nature of assessing “*de qi*.” To ignore “*de qi*” and simply study the physical laws and relationship between stimulation degree and effect amount is not completely consistent with the actual process of the acupuncture dose–effect. The presence or lack of the “*de qi*” sensation is based on the feeling and experience of the acupuncturist and the patient, and lacks an objective evaluation index. Therefore, the objective evaluation of “*de qi*” is an important topic in the study of manipulation. Thus, more interdisciplinary ideas and methods should be introduced to resolve this issue^[30] in conjunction with objective metrology as the evaluation standard.

Secondly, the quantitative operationalization of acupuncture is an important element of the standardization of acupuncture research. Traditional acupuncture manipulation is complex and difficult to quantify. Although some instruments can assess the parameters of acupuncture manipulation, there are still some defects in the

standardization research. For example, these assessment methods can only simulate the operation of hand acupuncture aspects of simple lifting and insertion, twist amplitude, and frequency but cannot completely replicate the line and adjustment of hand acupuncture. This differs from traditional acupuncture in the sense that electro-acupuncture, transcutaneous acupoint electrical stimulation, and laser acupuncture achieve the acupuncture process by the intensity, frequency, and laser output power of pulse current. How to embody the essence of traditional acupuncture and objectively reflect the degree of acupuncture stimulation is another dilemma for researchers at present. Acupuncture strength refers to the entire acupuncture exercise^[31]. Although we have made some explorations into acupuncture finger force, it is still a weak area in the research of manipulation metrology. Thus, further research into acupuncture finger force is needed.

Finally, the mechanism of acupuncture onset is complex. The influencing factors include acupoint specificity, *de qi*, body state, acupuncture manipulation, stimulation degree, etc. These factors interact and do not exist in isolation. Researchers also select the time, acupuncture frequency, amplitude, and other factors to study manipulation. However, in the process of producing an acupuncture effect, which factors play a decisive role remains inconclusive. Therefore, I recommend that the effects of various factors and their interactions should be comprehensively considered. Random block design, latin square design, or multi-factor and multi-level orthogonal design can be used for variance analysis to more objectively reflect the dose–effect relationship of acupuncture manipulation.

I believe that acupuncture belongs to the category of natural sciences and should have a clear and scientific concept of quantity. The standardization of acupuncture manipulation metrology is the only means by which acupuncture therapeutics can become quantitative and standardized. This process remains in its infancy and requires the joint efforts and full support of all acupuncture scholars moving forward.

Conflicts of interest statement

None.

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