Review Article

The Historical Development of Deqi Concept from Classics of Traditional Chinese Medicine to Modern Research: Exploitation of the Connotation of Deqi in Chinese Medicine

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Although it is difficult in fully clarifying its mechanisms and effects, Deqi still can be considered as an instant sign of acupuncture response of the patient and acupuncturist, which has a significant value in clinic and research. This paper aims to take a history trace to the development of Deqi theory, understand the connotation of Deqi based on Chinese medicine theory, and establish an evaluation methodology accordingly. We believe that Deqi is not only the needling sensation, but also the perception of changes of qi flowing of the patient elicited by needling on acupoints. The signs of Deqi include the patient's subjective perception (needling sensation), the objective physiological changes (common referred to the skin redness around the acupoints and the response of brain), and the acupuncturists' perception. Although Deqi is essential for attaining the effect, it may not be the necessary sign of the ideal efficacy. It is found that the characteristics of Deqi sensations, Deqi's intensity, time duration, and the propagation will all affect the efficacy. Thus, acupuncturists should pay attention to elicit and control Deqi state, which is also the key point in modern research on the therapeutic implications of Deqi.

1. Introduction

There is so far little evidence of investigating the relationship between the therapeutic efficacy of acupuncture and the Deqi experience. However, as the specific perception of acupuncture stimulation, Deqi may influence the physical and psychological condition of the patients.

The terms of “Deqi” and “Qizhi” were first found in “Huang Di Neijing” [1]. The sentence “acupuncture therapy does not take effect until the arrival of energy,” which is thought to be the basic principle to guide the clinical practice of acupuncture. At present, most acupuncture doctors and researchers in China [2–5] believe that Deqi is essential for the efficacy of acupuncture and it is necessary to induce Deqi sensation to a certain degree.

Some clinical results confirm that Deqi reveals some connection with the efficacy of acupuncture treatment [6–11]; however, others concluded that Deqi sensations did not result in effectiveness [12, 13]. Learning from these studies, we found that studies conducted in China usually applied deep needling (1 to 2 cm) with manipulations every 5 min during needle retention (30 min as usual), so as to maintain certain intensity and time duration of Deqi sensations. While the studies abroad mostly insert superficially or manipulate needle only once in the treatment.

There is one sentence in Neijing that talked about Deqi: “The qi in acupoints is delicate, means that to elicit responses of qi (Deqi), maintaining qi, and watch the movements of energy is an important step in acupuncture therapy.”
(from Ling Shu Chapter 3 on minute needle). It confirmed that “maintaining qi” actually refers to the fact that maintaining the intensity and time duration of needling sensation is necessary after Deqi. The manipulation every 5 min during needle retention after Deqi may be the key to a higher efficacy in the study. Some researchers also pay attention to the dose-effect relationship of acupuncture and consider that the efficacy of acupuncture treatment depends on complex factors, such as the number of needles, depth of needling, point location, needling retention, and interval between two sessions [14]. Therefore, the intensity of needling in most present acupuncture studies might not be enough for achieving therapeutic effects. It may help some confounders to have biased findings toward a negative outcome [15, 16]. These views support that Deqi is a key to the treatment efficacy. However, the diversity of perspectives on the relationship between Deqi and effect in current studies may be caused by different understanding of Deqi.

The distinct difference in the understanding of Deqi can be found in the literatures in China and other countries. Among the Deqi related literatures published in China since 1950, there are 137 articles (67%) discussed on the understanding of Deqi. There are a variety of definitions of Deqi across different textbooks.

2. The Definitions of Deqi Nowadays

In the latest “Eleventh Five-Year” national plan textbook “Acupuncture and Moxibustion,” Zhen Jiu Xue [17] states: “Deqi, normally called Qizhi in ancient, or needling sensation in modern, refers to the response of channel qi elicited by acupuncture stimulation such as lifting, thrusting, as well as rotating the needle after inserting the needle into an acupuncture point.” The signs of Deqi include two aspects, one is the patients’ needling sensations, and the other is acupuncturist’s perceptions. When obtaining qi, the patient may feel sensations of suan (soreness), ma (numbness), zhang (fullness/distention), and zhong (heaviness) and sometimes a feeling of heat, cold, pain, itching, muscular twitching, formication, and so forth, and those sensations can spread in some certain directions. A few patients may show the reaction of twitching or involuntary movement of skin and muscles along the stimulated channel, or red skin rash, or red or white lines on the skin around the punctured area. At the same time, the acupuncturist may feel heavy, tight, or vibration of the needle. If Deqi is not evoked, the patient would not have any special feeling or reactions, and the acupuncturist may feel the needles are loose and empty.

The widely accepted definition of Deqi in English language textbooks is: “Traditional acupuncture involves stimulation with very fine needles inserted into defined sites on the body, eliciting a composite of sensations, termed Deqi, which is considered to be related to clinical efficacy in traditional Chinese medicine” [18].

The latest Chinese-English Dictionary of Traditional Chinese Medicine (TCM) defines Deqi as “needling sensation, which refers to the patient’s response to sore, numb, distention, electric shock and the doctor’s heavy and tight sensation coming from beneath the needle” [19].

Several randomized controlled clinical trials in a large sample with a significant influence usually defined Deqi as “an irradiating feeling deemed to indicate effective needling” [6, 20, 21].

Recently, the most common definition of Deqi is “the needling sensations of both patient and acupuncturist.” However, in the theory of TCM acupuncture, needling sensation is the most significant manifestation of Deqi, but they are not equal on the level of connotation. In addition, modern functional brain imaging technology also demonstrated that classic Deqi sensation, such as a sense of soreness, had different effect on the certain area of the brain compared with sharp pain [22] which further supports the point that Deqi is not equal to needling sensation.

3. The Origin of Deqi Theory

The theory of TCM acupuncture generated from traditional Chinese culture. Therefore, prior to the study of Deqi theory, we should firstly understand its background, and then the connotation of Deqi could be explained by modern research methods.

Deqi is derived from the concept of “Qi” in “Huang Di Neijing” (written in AD 206~221 [23]). “Qi” is an important concept in Neijing to describe the activities of human life. The ability to maintain a healthy state is normally called healthy qi (zheng qi) or grain qi (gu qi), while the exogenous pathogenic factors that lead to varieties of diseases or pathological changes in the body are called pathogenic qi (xie qi).

In Neijing, the formation of the theory of “Qi” is mainly originated from “the theory of qi transformation in life” in Taoism. In the Taoism work “Huai Nan Zi” [24], “body”, “qi”, and “mind” are composed of three treasures of life. They are interdependent and mutually related. The efficacy of acupuncture would be closely related to the patient’s mental status and psychological factors, showing correspondence between “qi” and “mind”. Both the patient and acupuncturist will perceive certain sensations after Deqi, which is actually the interactions between “qi” and “body”. Moreover, TCM holds that the qi of the human body corresponds to the seasons, resulting in the relationship between physiological changes and the replacement of the four seasons. Thus, the seasons may affect the difficulty of Deqi. For example, the blood flows superficially in summer, during which Deqi is easier, while the blood flows deeply in winter and Deqi is relatively difficult. In Neijing, “qi” can also be classified into three categories: organ’s qi (Zangqi), channel’s qi (Jingqi), and vessel’s qi (Maiqi). These three types of qi circulate in the body nonstopingly. Therefore, stimulating acupoints on channel can regulate the certain internal organ to cure the disease. Detecting the changes of pulse can also be applied to determine “Deqi” in Neijing.

In summary, the theory of “Qi” in Neijing is the basis of the traditional acupuncture theory of “Deqi.” Phenomenon and impact of Deqi are all developed on this basis. TCM acupuncture emphasizes that the acupuncturist should concentrate on the needling process and carefully perceive the sensations below the needle to judge and regulate qi of the patient.
4. The Development of Connotation of Deqi

The view that acupuncture treatment efficacy is closely related to Deqi originated in Neijing. "If insertion of needle fails to bring about the response of energy, treatment should be continued for as long as necessary. Acupuncture therapy does not take effect until arrival of energy (Qizhi)." (from Lingshu Chapter 1 Nine needles and twelve original points). What is more, there is a detailed explanation of "Qizhi" in Neijing. "the principles of needleling dictate that needle should stop as soon as energy is brought into harmony, due to tone up the body energy of yin and sedate the pathogen of yang, or to tone up the body energy of yang and sedate the pathogen of yin." ... The assertion that needling takes effect so long as Qizhi means that an excessive disease could be sedated and the deficient energy may be complement." (from Lingshu Chapter 9 From beginning to ending). It expresses that the function of acupuncture is "regulating qi," which can be achieved by supplementing and draining acupuncture manipulation. Therefore, pathogens can be eliminated, deficient healthy qi can be supplemented, or reversed flow of qi be adjusted, leading to a state of yin-yang balance. The connotation of "qi" in "Qizhi" refers to healthy qi or grain qi. Obviously, Qizhi indicates "proper intensity of stimulation" and also the sign of removing the needle. In Neijing, "Deqi" and "Qizhi" are usually considered as the same, regarded as a sign of efficacy [25, 26].

The Difficult Classic (Nanjing) [27] written in AD 106~210 [28] normally has similar reputation as Neijing in Chinese medicine. The chapter of Seventy-eight Difficult Issues states, "Insert a needle along the route of the channel to induce Deqi firstly. Then thrusting the needle inward is a supplementary method, while lifting the needle outward is a draining method." That text shows that certain needling techniques for supplementary or draining are applied after Deqi. Nanjing describes Deqi as the basis and premise of acupuncture manipulation. It may indicate that Deqi and Qizhi are not the same. Deqi refers to the first period of Qizhi, which is the sign of ideal efficacy.

The development of acupuncture can be traced to the Jin and Yuan Dynasty (AD 1115~1368), clarifying that Deqi is the base of acupuncture manipulation. There is one sentence in Song to Elucidate Mysteries (Biao You Fu) written by Dou Hanqing starting, "Then the acupuncturist should perceive qi carefully. The sensation of loose and empty beneath the needle means qi does not arrive. While heaviness, tightness and fullness sensations suggest that qi has arrived. When qi arrives, manipulate the needle properly according to cold or heat syndromes; when qi does not arrive, wait for qi according to deficiency or excess conditions." It keeps the same point as the Nanjing. Till that time, it is found that Deqi not only is related to the treatment efficacy, but also can be used to determine the prognosis of the disease. As written in Song to elucidate mysteries, "the more quickly of qi arrives, the easier the disease is to cure; supposing the qi does not arrive, the patient may be hard to cure," which means that the degree of difficulties of getting Deqi can predict the efficacy. Of course, here, the efficacy does not refer to the real-time acupuncture effect but to the significant treatment efficacy of the disease.

As the acupuncture developed in the Ming and Qing dynasties (1368~1911), there is a further illustration of the relationship between the acupuncturist's perception of the needle and efficacy. One of the most influenced publications at that time, The Complete Compendium of Acupuncture and Moxibustion (Zheng Ji Da Cheng) [29], states, "How to remove the needle depends on the acupuncturist's perception on the needle. Extremely tense and firm sensation beneath the needle indicates the needle is being grabbed by pathogens, not by the healthy qi, therefore, the needle cannot be removed. If the needle was removed at this moment, the disease might be palindromia. Instead, needling techniques for supplementary and draining should be applied and retain the needle for a certain period. Only when a looser sensation beneath the needle is felt, the needle can be removed." According to these texts, acupuncturist should clarify the sensations beneath the needle after Deqi. It is called "distinguishing qi."

Originating from Nanjing, the connotation of "Deqi" and "Qizhi" are different; "Qizhi" is obtaining the effect of the final state through the returning of qi in human body by normal acupuncture treatment, while "Deqi" is the early part of "Qizhi," which means that the qi has been elicited to the needle. After realizing Deqi, it is still needed to distinguish the character of qi and apply the related manipulation or retain the needle, so as to reach the "Qizhi" state [30~33].

5. The Evaluation Method of Deqi Based on Its TCM Connotation

5.1. Both Notice the Perception of Patient and Acupuncturist. Evaluation of Deqi in ancient Chinese medicine mainly focused on the acupuncturist's perceptions, rather than the patient's needling sensation during an acupuncture treatment. Ancient Chinese acupuncturists believe that during acupuncture, the acupuncturist should concentrate on the changes of qi after the needle being inserted, so as to know the situation of patient and disease, then give appropriate needling manipulations to regulate qi. Moreover, the ability of "eliciting qi," "distinguishing qi," and "regulating qi" reflects the level of healing skill of the acupuncturist. In modern time, Deqi is defined as the needling sensation, so the quantitative evaluations of Deqi are mainly based on the patient's needling sensations [34~37]. Although the needling sensations of the patient are more direct and sensitive, we suggest that the perceptions of the acupuncturist should be noticed as well, which is the key of "regulating qi with the needle."

5.2. Distinguish the Sensation of Penetrating Skin from Deqi. In TCM, Deqi is the sign of the change of qi, so it should be elicited when the needle is inserted into the acupoint. Park et al. [38] also find a strong connection between acupuncture sensation and tissue depth; the frequency of pricking and sharp sensation was significantly greater in shallower tissue levels, and the frequency of sensations described as traditional Deqi sensation, such as dull, heavy, and spreading, was significantly greater in deeper tissue levels. Therefore, the pain or other sensations which could be felt when
the needle penetrated skin is not Deqi sensation. In recent needle sensation questionnaire/scale, the item “sharp pain,” “pricking,” and “penetrating” may evaluate the sensation of penetrating skin but not Deqi. It would be better to design an instrument for calling attention to the patient to distinguish the sensation of needleling penetrating from Deqi.

5.3. Evaluating Deqi More Comprehensively Than Existence and Intensity. Deqi is closely related to the treatment efficacy in Neijing; however, the formation of Deqi is only the first step of achieving the ideal efficacy in traditional theory. Through diagnosing based on qi after Deqi, retaining the needle skills further improve the acupuncture efficacy. After immediately finishing the treatment after Deqi, the patient condition would deteriorate as the dose of stimulation is not enough. It was also stated that “Qi extending affected treatment partially” as mentioned in Zhen jiu Da Cheng, which means that the correct direction and a certain distance of Deqi spreading can enhance the efficacy. Therefore, the evaluation of Deqi existence and intensity is only two aspects in evaluating the relationship between the Deqi and the treatment efficacy. The nature of qi, intensity, duration, and the spreading should be recorded comprehensively by Deqi evaluation instrument, which may influence the efficacy in clinical trials.

5.4. Notice the Influence of Deqi in “Mind”. The traditional theory of Deqi does not merely refer to the needle feeling, but also includes the reaction of “qi” in the human body. According to TCM theory, this phenomenon can affect constituting the other two significant elements of the human body: the “body” and “mind;” manifested in “body” is the needle feeling, while that manifested in “mind” referred to the change of the state of brain function, which are the two most important factors in evaluating the Deqi.

The study of brain central mechanisms of acupuncture carried out recently is combined with a large number of brain imaging technology (PET, SPECT, fMRI, etc.), which provides a scientific method in investigating the Deqi. Researchers hope to define a model of Deqi brain function by applying the brain functional imaging technology, through which the cases fit this model can be defined as Deqi, so it may become easy to distinguish whether to get Deqi or not [39]. Kong et al. [40] have confirmed that the signals of fMRI can correctly reflect the specificity Deqi state between the different individuals, which provides a reliable method to evaluate Deqi.

6. Conclusion

Acupuncture is one of the important methods to realize “mediating meridians, regulating the qi and blood” in TCM, in which Deqi plays an important role in the process of acupuncture. Neijing lays the theoretical basis of the theory of Deqi. Deqi does not only refer to needleling sensations, but also involves the changes of qi induced by needle insertion into the acupoint. The signs of Deqi include the patient’s sensations (needleling sensations), objective physiological changes (commonly refer to the skin redness around the acupoint as well as the response of brain), and the acupuncturist’s perceptions. Deqi is closely related to the treatment efficacy; however, it is not a necessary sign for the most ideal efficacy. The characteristics of Deqi, including what kind of sensations of both patient and acupuncturist, their prevalence, intensity, time duration, and the propagated sensation along channel will all affect the treatment efficacy. So acupuncturists should pay attention to elicit Deqi and control its state, which is also the key point in modern research on the therapeutic implications of Deqi.

Authors’ Contribution

Hong-Wen Yuan and Liang-Xiao Ma contributed equally to this work.

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