

The evolving conception and practice of acupuncture-moxibustion

针灸学概念沿革和创新实践

Li Cong-cong (李聪聪)¹, Gabriel Shimizu Bassi², Luis Ulloa³, Yin Lei-miao (尹磊淼)^{4,5}

1 Shanghai University of Traditional Chinese Medicine, Shanghai 201203, China

2 Universidade de São Paulo, Sao Paulo 66281, Brazil

3 Rutgers University New Jersey Medical School, New Jersey 07101, United States

4 Shanghai Research Institute of Acupuncture and Meridian, Shanghai 200030, China

5 Shanghai Innovation Center of TCM Health Service, Shanghai 201203, China

Abstract

With the emergence of the modified forms of acupuncture-moxibustion such as dry needle, the discipline acupuncture-moxibustion faces significant opportunities and challenges. The concept and treatment of acupuncture-moxibustion need to combine with modern medicine to consolidate the effectiveness and apply the research results to guide clinical treatment. By reviewing the brief history of acupuncture-moxibustion in the Western countries and summarizing the definitions, this article was to propose the trend and development strategies of this discipline in the future.

Keywords: Acupuncture Therapy; Moxibustion Therapy; Acupuncture-moxibustion Science; Concept; Dry Needle; Translational Medical Research

【摘要】随着干针等新针灸疗法出现,传统针灸学面临重大的机遇和挑战。针灸学概念和治疗方式需要和现代医学结合,进一步夯实效应物质基础并积极将研究成果应用指导临床治疗。通过回顾针灸在西方国家传播历史和针灸学概念发展沿革,提出针灸学在未来发展的应对策略和趋势。

【关键词】针刺疗法;灸法;针灸学;概念;干针;转化医学研究

【中图分类号】R245-0 **【文献标志码】**A

Traditional Chinese Medicine (TCM) is one of the most representative features of Chinese civilization and is a medical science formed and developed over thousands of years^[1]. Acupuncture-moxibustion is one of the most known treatment approaches of TCM for at least 2 500 years, being considered an effective, feasible and safe intervention in patients nowadays. Acupuncture is a technique in which practitioners stimulate specific points on the body, most often by inserting thin needles through the skin^[2]. The medical societies in Europe and the United States often use the term 'acupuncture and herbal medicine' to describe the whole concept of TCM. It means that acupuncture has been highly accepted in the international medical community, such as the World Health Organization (WHO), who officially listed 43 diseases including asthma that can be treated by acupuncture in 1979, and extended this list to 107 diseases in 2002^[3]. According to the WHO, 103 state members have approved acupuncture-moxibustion practice, 29 of them have

enacted TCM, and 18 have included acupuncture and moxibustion treatment in their medical insurance provisions. In addition, the World Federation of Acupuncture-moxibustion Societies (WFAMS), based in China, currently has 251 member organizations from 67 countries^[4]. However, acupuncture-moxibustion is also facing many challenges in Western countries nowadays. This article was to review the brief history of acupuncture-moxibustion out of China and the debate of acupuncture concept, summarize the definition of acupuncture, and propose the future direction of acupuncture.

1 The Brief History of Acupuncture-moxibustion in the West

France and the United States are two representatives in the development of acupuncture.

France was the first country that accepted acupuncture in Europe where acupuncture became popular^[5]. As early as the 17th and 18th centuries, acupuncture was introduced to France by the Jesuit missionaries, and the 'acupuncture fever' arose in France. At the beginning of the twentieth century,

Author: Li Cong-cong, master degree candidate

Corresponding Author: Yin Lei-miao, M.D., professor.

E-mail: collegelylm@shutcm.edu.cn

George Souliéde Morant, a consul of the French Consulate in China, was very interested in acupuncture treatment and studied acupuncture in China. He also published a French book on acupuncture named *Précis de la Vraie Acupuncture Chinoise: Doctrine, Diagnostic, Thérapeutique (Concise Summary of the Real Chinese Acupuncture: Doctrine, Diagnostic, Therapeutic)* in 1934. A French doctor, Paul Nogier, published an article entitled 'The distribution of ears in the shape of embryo reflection' in *French Journal of Acupuncture and Moxibustion* in 1956^[6]. France established French Association of Acupuncture to translate and publish Chinese medicine and acupuncture books in 1966^[7], and founded École Européenne d'Acupuncture (EEA) (European College of Acupuncture) to spread and train traditional acupuncture in 1975^[8]. From 1990, acupuncture has officially been included in the curriculum, and the French government announced that it would authorize universities to issue national degree certificates in Chinese medicine and acupuncture in 2007^[9]. In 2016, the European Federation of Chinese Medicine Experts hosted the first 'Cancer and Chinese Medicine Forum' at Curie Medical College to decide to use acupuncture for randomized controlled clinical studies of fatigue due to breast cancer chemotherapy, and to evaluate the efficacy of acupuncture by immunological tests^[8]. Acupuncture is popular among French doctors and the public with its unique therapeutic effect and low medical cost.

Meanwhile, acupuncture has been widely accepted in the United States. In 1950, American physicians who practiced TCM reported that deafness, paraplegia, ileus and migraines could be treated with acupuncture^[10]. In 1971, a famous reporter named James Reston published a report in the *New York Times* entitled 'Now let me tell you about my operation in Peking' about his appendicitis surgery in which acupuncture was adopted for his post-operative abdominal bloating and discomfort^[11]. Nevada has signed the acupuncture act, the first acupuncture bill in the United States that recognizes the legality of acupuncture in 1973. Dr. Su Tian-you, from Hong Kong Academy of Acupuncture, established the first government-accredited acupuncture school, New England Acupuncture School, in Washington in 1976^[12]. A non-profit organization named the National Certification Commission for Acupuncture and Oriental Medicine (NCCAOM) was established in 1982. Its mission is to advance the professional practice of acupuncture and Oriental medicine by establishing and promoting national evidence-based standards of competence and credentialing^[13]. Nowadays, 44 of the 50 U.S. states issue acupuncture licenses by a qualification exam under the NCCAOM^[14]. The Food and Drug Administration (FDA) has issued 510 kinds of acupuncture needles among 50 different brands in the

United States since 1996^[15]. Nearly eighty research projects on acupuncture clinical research were funded by the National Institute of Health (NIH) in 2008. In addition, the US Bureau of Labor Statistics announced a new standard and independent occupational classification code (29-1291) for acupuncture treatment for the first time in 2016^[12]. The Department of Veteran's Affairs Handbook issued standards for employing acupuncturists in 2018, confirming that the military has accepted acupuncture treatment^[16].

From the history of acupuncture spreading in these two countries, we can see that this treatment has been wildly accepted by the Western society. But, there are still some debates.

2 The Debate on Acupuncture-moxibustion Concept

Interestingly, the debate mainly focused on the concept. One of the clear example is dry needle. Dry needle involves the use of either solid filiform needles or hollow-core hypodermic needles for treatment of muscle pain (not necessarily apply to acupoints)^[17]. The orthodox definition of acupuncture by NIH: most often done by inserting thin needles through the skin, to cause a change in the physical functions of the body^[18]. There is no doubt that dry needles belong to acupuncture. It is not only because they all use needles to treat diseases, but also they are common in three aspects, such as history, medical standards and medical apparatus.

In terms of history aspect, the earliest reference of dry needle was in an article about low back pain in 1947 when Paulett reported that dry needle and injecting saline both relieved pain^[19]. Simons DG, *et al*^[20] and Travell J, *et al*^[21] explored the origin of myofascial pain and commented that dry needle can effectively treat myofascial pain in 1952. Karel Lewit from Czechoslovakia published a paper later widely recognized as a landmark paper in the development of dry needle in 1979. He used acupuncture needles to verify the treatment effectiveness of dry needle, such as analgesia. The immediate analgesia produced by needling was called 'needle effect'^[22]. Peter Baldry, a United Kingdom based physician with an interest in acupuncture, published a book entitled *Acupuncture, Trigger Points and Musculoskeletal Pain* in 1989^[23]. Importantly, he made some attempt to reconcile trigger point theory with traditional Chinese acupuncture theory and he did not confine his use of dry needle to myofascial trigger points. Some physiotherapists propose that dry needle is not acupuncture points, and they intend to deny acupuncture and want to use legislation to replace the orthodox acupuncture with the so-called dry needle^[24]. However, the originators and proponents of dry needle acknowledged that

certain aspects of this technique were inspired by acupuncture^[25].

In terms of medical standards and medical apparatus aspect: dry needle is not strictly regulated and has few standards that need to be complied with^[26]. The dry needle researchers proclaim that they do not need to have the same training as acupuncturists and it is a new treatment of 'de-acupuncture'^[24]. The American Medical Association adopted a policy in 2016, showing that physicians or non-physicians practicing dry needle should have standard training, certification, and continuing education as acupuncturist. The American Medical Association board member Russell Kridel stated that 'for safety of patients, practitioners should meet standards required for licensed acupuncturists and physicians'^[27]. For the medical apparatus and instruments, the 'solid filiform needle' used in dry needle is approved by the FDA as a Class II medical device. It is described in the code titled 'Sec. 880.5580 acupuncture needle' as 'a device intended to pierce the skin in the practice of acupuncture'^[28].

Without the interest in acupuncture in the mid-1970s and the introduction of acupuncture needles into contemporary practice, it is likely that dry needle would never have become an established modality despite both techniques share the same therapeutic mechanism mainly via neural reflex arcs^[23-24]. The theory used in these therapies is same, but it is not summarized in the ancient definition of acupuncture. The debate on whether dry needle belongs to acupuncture is a conceptual controversy that can promote the progress of the conception and the entire discipline. In summary, acupuncture may be defined as a discipline under the guidance of both TCM and modern science technology. The characteristic of this discipline is to use needle and moxibustion to treat various diseases and conduct corresponding mechanism study^[29].

3 The Clinical Effectiveness Study Under the New Conception

Under the guidance of the new conception of acupuncture, the future direction of acupuncture lies in two aspects: clinical effectiveness study and translational medicine study. Regarding the clinical study, the effectiveness of treatment for diseases has been recognized by international organizations. International researchers have published randomized controlled trial (RCT) results in the prestigious journals. For instance, the researchers want to assess the effect of electroacupuncture for women with stress urinary incontinence. The multicenter, randomized clinical trial showed that the electroacupuncture treatment over 6 weeks significantly decreased urine leakage than that of the control group^[30]. Another research aimed to

investigate the long-term effects of true acupuncture compared with sham acupuncture for migraine prophylaxis. It was a 24-week randomized clinical trial, and the study showed that acupuncture was more efficacious than sham acupuncture and no treatment^[31]. Meanwhile, some studies have proven that acupuncture is not effective for some illnesses. The researchers used a single-blind, parallel-group randomized clinical trial to determine the efficacy of acupuncture compared with a sham acupuncture control performed among women undergoing in vitro fertilization on live births. The results showed that administration of acupuncture versus sham acupuncture at the time of ovarian stimulation and embryo transfer resulted in no significant difference in live birth rate^[32]. The effect of acupuncture on live birth rate of women with polycystic ovary syndrome was assessed. Compared to control groups, the result showed that acupuncture treatment did not increase live birth rate. This finding did not support acupuncture as an infertility treatment in such women^[33].

4 Acupuncture Treatment and Translational Medicine Research

Translational medicine is the bridge between basic and clinical disciplines, and its core is to effectively translate the basic medical research results into theories, techniques, methods and drugs^[34-35]. If we identify the translational medicine study and objective rule of acupuncture treatment of disease, it not only can improve the clinical efficacy of acupuncture, but also can develop new treatments by modern molecular biology, biochemistry and other means^[36]. In the translational medicine study of acupuncture, the drug intervention can imitate the acupuncture effect to participate in the disease regulation. Intervention experiments provide complete experimental evidence for the ultimate discovery of new drug targets and innovative drugs. The stimulation of Zusanli (ST 36), an acupoint located in the lower limbs, can decrease the serum levels of inflammatory factors in septic animals. Anti-inflammatory acupuncture effect neither disappears due to splenectomy, nor depends on the epinephrine, norepinephrine. But it is dependent on the production of dopamine through the expression of aromatic L-amino acid decarboxylase (AADC) in the adrenal gland^[37]. The administration of fenoldopam, a dopamine receptor agonist, can reduce the level of high mobility group box-1 protein (HMGB1) and induce 'acupuncture-like' effects^[37].

Researchers also found that acupuncture can decrease inflammation in asthma model mice by identification of transgelin-2, which promoted airway smooth muscle cell (ASMC) and suppressed lung resistance^[38]. Low expression of metallothionein-2

(MT-2) protein (50%) was found in asthmatic lung tissue of ovalbumin-induced asthmatic rats. In addition, increased airway resistance in the mouse model of asthma after MT-2 gene knockout indicates that MT-2 plays a key role in the pathogenesis of asthma. Conversely, injection of MT-2 recombinant protein could effectively improve the asthma model respiratory function. The effects of MT-2 in smooth muscle relaxation (more than 60%) were also confirmed in the rat tracheal spirals and it was more effective than terbutaline. Pull down and mass spectrometry results discovered the binding protein of MT-2 on tracheal smooth muscle cells transgelin-2, and the binding was confirmed by using RNA interference technology and receptor radioactivity analysis as well. MT-2 induced tracheal smooth muscle relaxation by phosphorylating ezrin protein and dephosphorylating the myosin light chain phosphatase targets subunit 1 (MYPT1) that regulated the interaction of the actin and myosin. Next, through molecular docking analyses, virtual screening, cell biological function test as well as verification in different asthma models, a small molecule that specifically binds to acupuncture anti-asthmatic target transgelin-2 and achieves 'acupuncture-like' relaxation of tracheal smooth muscle was found^[38]. Transgelin-2 agonists may represent a promising novel approach for treating asthma, with potential clinical advantages over existing therapies^[39]. Under the new definition of acupuncture, we may find more effect material basis in more fields in the future.

5 Perspective

The future direction of acupuncture may lie in three aspects. Firstly, the concept of acupuncture may evolve. It is important that acupuncture will be guided by both TCM and modern science technology, and this discipline is to use needle and moxibustion to treat various diseases and conduct corresponding mechanism study. Secondly, more international recognition will be obtained by publishing RCT results in the prestigious journals, to get more scientific evidence for using acupuncture treatment. Finally, scientific research results can be used in clinical treatment to improve the therapeutic effect of acupuncture. A small molecule that can achieve 'acupuncture-like' effect was named as acupuncture drug in the field of asthma drug development. Researchers can use this discovery to invent new in vitro treatments, just like wearable therapeutic devices, infrared, or microwave treatment like 'acupuncture medicine', to reduce the pain of acupuncture treatment. Only in this way can a new situation be created for the evolution and inheritance of acupuncture, and the discipline of ancient acupuncture will embrace new vitality.

Conflict of Interest

There was no potential conflict of interest in this article.

Acknowledgments

This work was supported by National Natural Science Foundation of China (国家自然科学基金, No. 81873373, No. 81473760, No. 81574058, No. 81774429); Shanghai Talent Development Fund (上海市人才发展基金, No. 201610); Program for Professor of Special Appointment (Eastern Scholar) at Shanghai Institutions of Higher Learning [上海高校特聘教授(东方学者)岗位计划资助, No. JZ2016010]; Construction Project of Collaborative Innovation of Shanghai (上海市协同创新建设项目, No. ZYJKFW201701005).

Received: 28 May 2018/Accepted: 29 June 2018

References

- [1] Sun Y, Zhao Y, Xue SA, Chen J. The theory development of traditional Chinese medicine constitution: a review. *J Tradit Chin Med Sci*, 2018, 5(1): 16-28.
- [2] Acupuncture: In Depth. (2017-2-21) [2018-05-26]. <http://nccam.nih.gov/health/acupuncture/acupuncture-for-pain.htm>.
- [3] Use of acupuncture in modern health care. *WHO Chron*, 1980, 34(7-8): 294.
- [4] Traditional Chinese Medicine in China. (2016-12-7) [2018-05-20]. http://www.chinadaily.com.cn/kindle/2016-12/07/content_27601954.htm.
- [5] Bai XH. Periodization of international spread of acupuncture-moxibustion and their characteristics at each period. *Zhongguo Zhen Jiu*, 2014, 34(11): 1141-1143.
- [6] Gori L, Firenzuoli F. Ear acupuncture in European traditional medicine. *Evid Based Complement Alternat Med*, 2007, 4(Suppl 1): 13-16.
- [7] Wang Z. Traditional Chinese medicine in France: French Federation of Traditional Chinese Medicine. *J Chin Integr Med*, 2009, 7(2): 190-193.
- [8] Zhu MS, Ju LY. The development history, present situation and prospect of traditional Chinese medicine in France. *World Chin Med*, 2018, 13(4): 1013-1019.
- [9] He T. George Soulié de Morant: origin of "Western Chinese medicine". *Yunnan Zhongyi Xueyuan Xuebao*, 2013, 36(2): 81-83.
- [10] Dimond EG. Acupuncture anesthesia. Western medicine and Chinese traditional medicine. *JAMA*, 1971, 218(10): 1558-1563.
- [11] Reston J. Now about my operation in Peking. *New York Times*, 1971, 1: 6.
- [12] Yang Y. The development of acupuncture in the United States and its impact on the development of overseas Chinese medicine. *Chinese Medicine Culture*, 2017, (1): 36-41.
- [13] NCCAOM's History. (2016-7-21) [2018-05-20]. <http://www.nccaom.org/about-us/history/>.
- [14] Kwon Y. Chinese medicine education and its challenges in the United States. *Chin J Integr Med*, 2014, 20(4): 256-262.

- [15] Mandala health care. 2002. (2016-9-20) [2018-05-17]. https://www.accessdata.fda.gov/cdrh_docs/pdf2/k023054.pdf.
- [16] From the CEO Desk. (2017-1-15) [2018-05-16]. <http://www.nccaoom.org/resource-center/press/ceo-archive/ceo-archive-march-2018/>.
- [17] Zhuo LS. Acupuncture treatment based on properties of Weiqi (defensive qi). *Zhongguo Zhen Jiu*, 2010, 30(9): 763-767.
- [18] Acupuncture. (2016-5-26) [2018-05-20]. <https://medlineplus.gov/acupuncture.html>.
- [19] Deyo RA. Low-back pain. *Sci Am*, 1998, 153(2): 48-53.
- [20] Simons DG, Travell JG, Simons LS. *Myofascial Pain and Dysfunction: the Trigger Point Manual, Vol 1. Upper Half of Body*. 2nd Edition. Philadelphia: LWW, 1999.
- [21] Travell J, Rinzler SH. The myofascial genesis of pain. *Postgrad Med*, 1952, 11(5): 425-434.
- [22] Lewit K. The needle effect in the relief of myofascial pain. *Pain*, 1979, 6(1): 83-90.
- [23] Budd K. Acupuncture, trigger points and musculoskeletal pain. *Postgrad Med J*, 1994, 70(823): 388.
- [24] Jin GY, Jin LL, Jin BX. Dry needling: a de-meridian style of acupuncture. *Shijie Zhenjiu Zazhi*, 2016, 26(2): 1-5.
- [25] Fernández-De-Las-Peñas C, Arendt-Nielsen L, Gerwin R. Tension-type and Cervicogenic Headache: Pathophysiology, Diagnosis, and Management. Sudbury: Jones and Bartlett Publishers, 2010: 250.
- [26] Fan Y, Xu J, Li YM. Evidence and expert opinions: drying needling versus acupuncture (II): the American Alliance for Professional Acupuncture Safety (AAPAS) white paper 2016. *Chin J Integr Med*, 2017, 23(2): 83-90.
- [27] AMA adopts new policies on final day of annual meeting. (2017-11-12) [2018-05-24]. <https://www.ama-assn.org/ama-adopts-new-policies-final-day-annual-meeting>.
- [28] CFR: Code of Federal Regulations Title 21. (2018-4-1) [2018-05-27]. <https://www.accessdata.fda.gov/scripts/cdrh/cfdocs/cfCFR/CFRSearch.cfm?fr=880.5580>.
- [29] Yin, LM. Value of acupuncture in life science. *Acad J Second Military Med Univ*, 2017, 38(12): 1481-1485.
- [30] Liu Z, Liu Y, Xu H, He L, Chen Y, Fu L, Li N, Lu Y, Su T, Sun J. Effect of electroacupuncture on urinary leakage among women with stress urinary incontinence: a randomized clinical trial. *JAMA*, 2017, 317(24): 2493.
- [31] Zhao L, Chen J, Li Y, Sun X, Chang X, Zheng H, Gong B, Huang Y, Yang M, Wu X, Li X, Liang F. The long-term effect of acupuncture for migraine prophylaxis: a randomized clinical trial. *JAMA Intern Med*, 2017, 177(4): 508-515.
- [32] Smith CA, Lacey S, Chapman M, Ratcliffe J, Norman RJ, Johnson NP, Boothroyd C, Fahey P. Effect of acupuncture vs sham acupuncture on live births among women undergoing in vitro fertilization: a randomized clinical trial. *JAMA*, 2018, 319(19): 1990-1998.
- [33] Wu XK, Stener-Victorin E, Kuang HY, Ma HL, Gao JS, Xie LZ, Hou LH, Hu ZX, Shao XG, Ge J, Zhang JF, Xue HY, Xu XF, Liang RN, Ma HX, Yang HW, Li WL, Huang DM, Sun Y, Hao CF, Du SM, Yang ZW, Wang X, Yan Y, Chen XH, Fu P, Ding CF, Gao YQ, Zhou ZM, Wang CC, Wu TX, Liu JP, Ng EHY, Legro RS, Zhang H; Group PCS. Effect of acupuncture and clomiphene in Chinese women with polycystic ovary syndrome: a randomized clinical trial. *JAMA*, 2017, 317(24): 2502-2514.
- [34] Zerhouni EA. Translational and clinical science: time for a new vision. *N Engl J Med*, 2005, 353(15): 1621-1623.
- [35] Huang ZQ, Pei J. Application and development of translational medicine in modern acupuncture and moxibustion. *Zhongguo Zhen Jiu*, 2014, 34(5): 503-507.
- [36] Yang YQ, Yan C, Branford-White CJ, Hou XY. Biological values of acupuncture and Chinese herbal medicine: impact on the life science. *Evid Based Complement Alternat Med*, 2014, 2014: 593921.
- [37] Torres-Rosas R, Yehia G, Pena G, Mishra P, del Rocio Thompson-Bonilla M, Moreno-Eutimio MA, Arriaga-Pizano LA, Isibasi A, Ulloa L. Dopamine mediates vagal modulation of the immune system by electroacupuncture. *Nat Med*, 2014, 20(3): 291-295.
- [38] Yin LM, Xu YD, Peng LL, Duan TT, Liu JY, Xu Z, Wang WQ, Guan N, Han XJ, Li HY. Transgelin-2 as a therapeutic target for asthmatic pulmonary resistance. *Sci Trans Med*, 2018, 10(427): eaam8604.
- [39] Crunkhorn S. Asthma: alternative route to airway relaxation. *Nat Rev Drug Discov*, 2018, 17(4): 241.