DOI: 10.53469/jcmp.2024.06(08).42

Visual Analysis of Post-Stroke Cognitive Impairment Treated with Acupuncture Based on Citespace

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Abstract: ***Objective**: To visually analyze the literature on acupuncture in the treatment of post-stroke cognitive dysfunction (PSCI), in order to further understand the development trend and future prospects in this field. **Methods**: The relevant literatures collected by CNKI, Weipu Chinese periodical service platform and Wanfang Data knowledge Service platform were searched and mapped with CiteSpace, and the author cooperation, institutional cooperation, keyword co-occurrence, keyword clustering and keyword emergence were analyzed. **Results**: A total of 387 literatures were included, with 19 core authors, 11 keyword clustering modules and 11 emergent words. **Conclusion**: The research in this field is still in the exploratory stage. In the future, effective research information exchange platform should be actively established among scholars, research institutions and provinces to strengthen cooperation, so as to promote the rapid development of acupuncture in the treatment of PSCI.*

Keywords: Acupuncture, Cognitive dysfunction after stroke, PSCI, Citespace, Visual analysis**.**

1. Introduction

Stroke has become the main cause of death in China and the second leading cause of death in the world [1]. It often brings many sequelae to patients, such as hemiplegia, depression, dysphagia, insomnia, urinary incontinence and dementia. For patients with stroke, timely and effective treatment can ensure the life safety of patients to the greatest extent, but the sequelae of post-stroke cognitive impairment (PSCI) and other sequelae can not be solved in time. The abnormal living state caused by cognitive impairment often brings huge burden to patients and families, and its adverse effects will also seriously reduce the quality of life of patients' families. At present, cholinesterase inhibitors, excitatory amino acid receptor antagonists, nimodipine and other drug treatments are mainly used for PSCI. Although they have certain effects on PSCI, their effects are often limited and transient [2]. Acupuncture and moxibustion is a part of traditional Chinese medicine with a long history. Because of its advantages of simplicity, economy and no adverse drug reactions, it is often used as an important therapeutic means of traditional Chinese medicine rehabilitation. Moreover, it has been widely used in the treatment of post-stroke cognitive impairment and achieved certain objective curative effects [3]. In recent years, acupuncture therapy has been increasingly applied to the rehabilitation treatment of various cerebrovascular diseases, including PSCI, and the related research content in this field is increasingly enriched. At present, researchers have carried out mechanism analysis, theoretical discussion, curative effect observation and other research on acupuncture treatment of PSCI, but there is no literature to systematically summarize and analyze the research status and development trend in this field.

CiteSpace is a visual analysis software developed by the team of Professor Chen Chaomei of Drexel University in the United States. It can use quantitative methods to describe and monitor published articles, and display them in the form of maps. It visually presents the research status and trends through data visualization. This paper uses CiteSpace 6.1.r6 software to visually process and analyze the Chinese literature related to acupuncture treatment of PSCI since the establishment of the HowNet database, draw the relevant knowledge map, visually analyze its research situation, and focus on the future development trend, in order to provide references for further research on acupuncture treatment of PSCI by Chinese scholars.

2. Data And Methods

2.1 literature Search

Taking CNKI database as the data information source, the relevant literatures on acupuncture treatment of PSCI from the establishment of CNKI, VIP Chinese journal service platform and Wanfang Data knowledge service platform to February 28, 2023 were retrieved. The search strategy was "subject: Acupuncture + acupuncture + filiform needle + electroacupuncture + needle (precise)" and "subject: cognitive impairment after stroke + cognitive impairment after stroke + cognitive impairment after stroke + cognitive impairment after stroke (precise)".

2.2 Inclusion and Exclusion Criteria

Inclusion criteria: published Chinese Journal literatures related to acupuncture treatment of PSCI.

Exclusion criteria: 1) repeatedly published literature; 2) Conferences, newspapers, books, patents, achievements, characteristic journals, English literature and other documents unrelated to the subject; 3) Documents with incomplete information such as article, author, year, etc. and unable to obtain all research contents.

2.3 Data Processing and Conversion

The literatures that meet the inclusion criteria are exported in

refworks format, and the literature information includes the literature author, publishing institution, title, journal name, abstract, keywords and other information. Then, the CNKI data format converter in CiteSpace 6.1.R6 is used to convert them into the literature format recognized by the software, and saved as a "download_xx.txt" data file. Then, the converted data were imported into CiteSpace 6.1.R6 software for parameter settings. The time zone for analyzing the literature was January 2006 to February 2023, and the time slice was set to 1 year. The node types selected author, institution, keyword, and pruning selected Pathfinder and pruning sliced networks, and the other values were the default values. Finally, the results were visualized.

3. Results And Analysis

As of February 2023, a total of 410 relevant literatures were retrieved according to the above methods, and a total of 387 literatures were finally included, all of which met the requirements of this study.

3.1 Visual Analysis of Annual Document Issuance

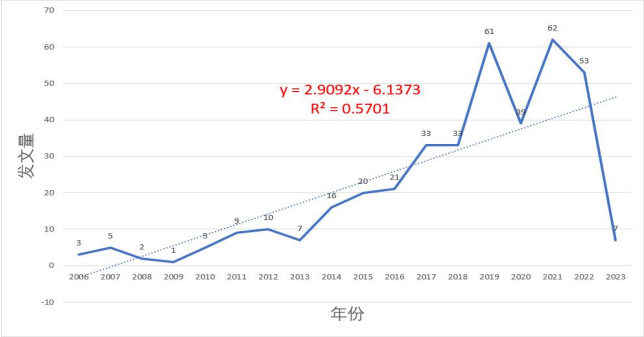

Figure 1: trend chart of the number of papers published on acupuncture treatment of cognitive impairment after stroke

The trend chart of the annual number of papers has the characteristics of being clear, intuitive, and clear at a glance. Through the chronological distribution of papers, we can see the development process of a discipline or a field in the concept of time [4]. As shown in Figure 1, according to the statistics of the included literatures according to the publication year and the number of published papers, it can be seen that the number of published papers generally shows an upward trend of y=2.9092x-3.1373, with R^2 =0.5701 (the closer R^2 is to 0.8, the higher the goodness of fit of the model, which can well reflect the development trend of literature in this field [5]). The relevant literature on acupuncture treatment of PSCI was first published in 2006. From 2006 to 2013, the number of papers published was generally low (≤ 10) and fluctuated, and the content was mainly clinical observation and experience summary. The number of articles published in 2009 was the lowest, with only one article published. The number of articles published in 2012 was 10, but it fell to 7 in 2013. After 2013, the number of documents started to grow. Although the number of documents fell and remained unchanged for a short time in the growth process, it still showed a rapid growth mode. The highest number of articles were published in 2019 and 2021, 61 and 62, respectively, but decreased in 2020 and 2022. Since the retrieval period is only up to February 2023, the figure shows that the number of articles published in 2023 is only 7, with a large decrease. With the increase of the overall number of publications, more and more scholars have published the characteristic acupuncture therapy for the treatment of the disease, which has provided many ideas and methods for the clinic, indicating that the field has been paid attention to and has made certain research scale and breakthrough progress.

3.2 Visual Analysis of Author Collaboration

The number of authors in the included literature is n=393, resulting in the number of connections e=473 and network density=0.0061. The low network density indicates that the cooperation between authors in this research field is not close. According to price's law, the number of papers published by the lowest producing author among the core authors is equal to 0.749 times the number of papers published by the highest producing author, and the specific formula is: M≈0.749 (M is the number of papers published by the lowest yielding author among the core authors, and is the number of papers published by the highest yielding author [5]), where n_{max}=9, M≈2.247 is calculated, and 3 papers are regarded as core authors [6], so there are 19 core authors in this field, with 81 papers, accounting for 21% of the total. The number of core authors should account for 50% of the total number of documents [7], which shows that the research teams are scattered and have not yet formed a significant core author group. See Table 1 for the top 10 authors in the number of published papers. The visual network map of cooperation among authors is shown in Figure 2. The size of the author's name in the figure is proportional to the number of published papers. The connection between the author's name represents the cooperation relationship, the temperature of the connection color represents the distance of the time of publishing, and the warmer the color represents the closer the time of publishing. In the research on acupuncture treatment of PSCI related fields, fujianming's team and Feng Xiaodong's team belong to the early research teams in this field, and the time of issuing the paper is in the early stage; Chen Lizao's team, Du Yuzheng's team and Liu Ye's team have all published papers in recent years, which are new research teams in this field. See Table 2 for the main members of each team with a large number of papers and research directions.

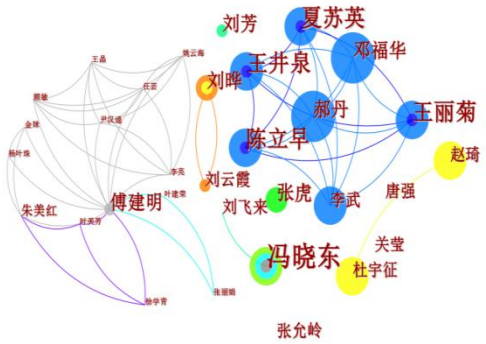

Figure 2: Map of author cooperation network of acupuncture treatment for PSCI (number of papers ≥ 3)

Table 1: Top 10 authors

Number	Literature (number of article)	Time	Author
1	9	2013	Feng Xiaodong
2	6	2015	Wang Jingquan
3	6	2015	Wang Liju
4	6	2015	Xia Suying
5	6	2015	Chen Lizao
6	4	2010	Fu Jianming
7	4	2016	Hao Dan

8	4	2016	Deng Fuhua
9	4	2016	Zhang Hu
10	4	2021	Liu Ye

Table 2: main teams and research directions of acupuncture treatment for PSCI

Number	Key team members	Team research direction
1	Feng Xiaodong, Liu Feilai	Therapeutic effect of Du moxibustion and warm acupuncture on PSCI
2	Chen Lizao, Xia Suying	The effects of acupuncture at Wuzangshu mainly on cognitive function and plasma homocysteine after stroke, meta-analysis of scalp acupuncture in the treatment of cognitive impairment after stroke, etc
3	Fu Jianming, Ye Jianrong	Observation on the curative effect of scalp acupuncture for a long time in the treatment of cognitive impairment grade ADL defect in community stroke patients
4	Zhang Hu,Wang Zhenyao	Effect of acupuncture combined with cognitive rehabilitation training on cognitive impairment after stroke and its influence on cytokines
5	Liu Yunxia, Liu Ye	Acupuncture combined with cognitive training in the treatment of mild cognitive impairment after stroke: a randomized controlled trial

3.3 Visual Analysis of Institutional Cooperation

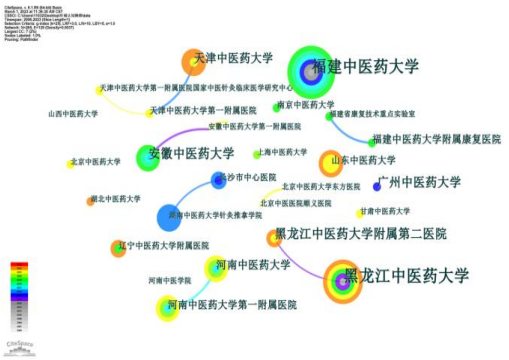

Figure 3: network map of institutional cooperation network for acupuncture treatment of PSCI (number of papers ≥ 3)

Visual analysis of the institutional cooperation in the included literature shows that the number of institutions is n=265, the number of connections is e=129, and the network density is 0.0037. The low network density indicates that the inter institutional cooperation is relatively loose. Figure 3 shows the cooperation network map of institutions with a number of documents ≥ 3. The size of the institution name is proportional to the number of documents sent. The color of the line represents the distance of the cooperation time between institutions, and the warmer the color, the closer the cooperation time between institutions. See Table 3 for the top 10 institutions with the largest number of documents, among which Heilongjiang University of traditional Chinese medicine has the largest number. According to the analysis of the network map, at this stage, the cooperation between institutions is mostly the cooperation of various universities of traditional Chinese medicine and their affiliated hospitals, research centers, etc., such as Heilongjiang University of traditional Chinese medicine, Tianjin University of traditional Chinese medicine, Henan University of traditional Chinese medicine, etc. At the same time, there are independent research institutions, such as Guangzhou University of traditional Chinese medicine and the Affiliated Hospital of Liaoning University of traditional Chinese medicine. There is less cross regional cooperation between institutions and less contact between different provinces. In order to avoid the regional limitations of research in this field in the future, research institutions should strengthen the cooperation between regions, so as to diversify the research direction of domestic acupuncture treatment of PSCI and maximize the research benefits.

Table 3: top 10 institutions of acupuncture treatment for PSCI

Number	Number of documents issued	Start year	Organization name
1	22	2007	Heilongjiang University Of Chinese Medicine
2	20	2011	Fujian University Of Chinese Medicine
3	10	2014	Anhui University Of Chinese Medicine
4	10	2011	The Second Affiliated Hospital of Heilongjiang University of traditional Chinese Medicine
5	9	2009	Guangzhou University Of Chinese Medicine
6	8	2016	Tianjin University Of Chinese Medicine
7	7	2016	Henan University Of Chinese Medicine
8	6	2017	The First Affiliated Hospital of Henan University of traditional Chinese Medicine
9	6	2014	Rehabilitation hospital affiliated to Fujian University of traditional Chinese Medicine
10	5	2021	Shandong University Of Chinese Medicine

3.4 Keyword Visualization Analysis

3.4.1 keyword co-occurrence

Keywords reflect the central point of view and core research content of the article, and high-frequency keywords can clearly express the research points [8]. Through visual analysis of the keywords in relevant literature, the keyword co-occurrence map is shown in Figure 4. The number of keywords included is n=247, the number of connections is e=544, and the network density is 0.0179. See Table 4 for the top 30 keywords and their corresponding centrality. "Stroke", "cognitive impairment", "acupuncture", "acupuncture" and other key words of high school psychokinesis can be used as a hub to connect multiple clusters, and play an important intermediary role in the field of acupuncture treatment of PSCI, which has been widely concerned by researchers [9]. After summarizing the key words, it is found that the current treatment methods are mainly acupuncture therapy, including Acupuncture, Scalp Acupuncture, Eye Acupuncture, Warm Acupuncture, Cluster Needling of head points, etc; Baihui and Shenting are the acupuncture points with the highest frequency; The research types in this field are mainly review, systematic review, clinical observation, etc; The measurement criteria include cognitive function and quality of life.

Figure 4: keyword co-occurrence map

Table 4: key words of the top 30 frequency of PSCI treated by Acupuncture

Number	Frequent and continuous	Centrality	Keyword	Number	Frequent and continuous	Centrality	Keyword
1	204	0.41	cerebral apoplexy	16	9	0.05	Eye acupuncture
2	124	0.47	Cognitive impairment	17	8	0.04	rehabilitation
3	100	0.63	acupuncture	18	8	0.03	traditional Chinese medicine
4	38	0.13	acupuncture and moxibustion	19	8	0.02	acupuncture treatment
5	31	0.14	apoplexy	20	8	0.03	curative effect
6	29	0.15	therapy of acupuncture	21	6	0.02	clinical observation
7	27	0.1	electroacupuncture	22	6	0	Warm acupuncture and moxibustion
8	22	0.12	rehabilitation training	23	5	0.18	head acupuncture therapy
9	22	0.14	cognitive	24	5	0.01	Shenting acupoint
10	21	0.09	head acupuncture	25	5	0.02	effectiveness
11	20	0.08	cognitive training	26	5	0.01	quality of life
12	16	0.13	summarize	27	4	0.06	Cluster needling of Scalp Points
13	16	0.06	scalp acupuncture	28	4	0.01	dementia
14	12	0.11	Baihui acupoint	29	4	0	cognition
15	9	0.03	system evaluation	30	4	0	medication

3.4.2 keyword clustering

Using the log likelihood rate (LLR) algorithm, the keyword (k) is clustered into 11 clusters (Figure 5), which shows the knowledge structure and dynamic change process of the field to a certain extent. The smaller the cluster number is, the more nodes are included in the label. The clustering module value is modular q=0.5833 (>0.3), and the contour value is sihoutte s=0.849 (>0.7). Generally speaking, if Q > 0.3, the divided clustering structure is considered significant, if s > 0.5, the clustering is generally reasonable, and if s > 0.7, the clustering has certain significance and credibility [10]. The specific content of each clustering label is summarized into a keyword clustering table (Table 5). The labels \0, \1, \4, \9 belong to acupuncture related treatment methods, and this part contains the most clusters; Labels \2, \3, \6, \7 are related symptoms of stroke disease; Label \10 belongs to the related pathological changes of stroke disease; Labels \5 and \8 are related to the efficacy judgment and research methods of treatment methods in this field.

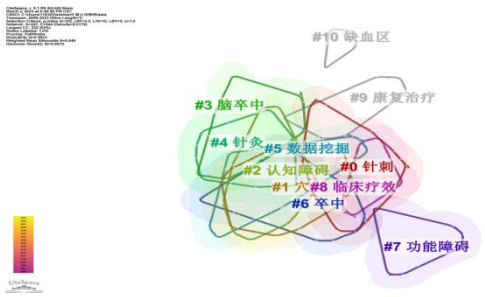

Figure 5: keyword clustering diagram

Table 5: keyword clustering table

Group number	Cluster labels	Scale	Time	Contour value	Main keywords (top 5 keywords in frequency)
#0	acupuncture	41	2017	0.862	Cognitive impairment after stroke; Mesh meta-analysis; Ischemic stroke; Rehabilitation training; Event related potential
#1	acupoint	35	2015	0.828	Rehabilitation training; Cognitive impairment; Meta analysis; Mild cognitive impairment; Resistance index
#2	Cognitive impairment	31	2018	0.814	Cognitive impairment; Catgut embedding at acupoints; rtms; Experience of famous doctors; Cognitive impairment after stroke
#3	cerebral apoplexy	25	2016	0.922	Cognitive dysfunction; Differentiation of meridians and pricking wells; Glial fibrillary acidic protein; Transcranial pulsed electrical stimulation; Axon growth associated protein-43
#4	acupuncture and moxibustion	23	2016	0.731	Cognitive training; Yishen Xingnao acupuncture; Mild cognitive impairment; Meta analysis; mmse
#5	data mining	18	2020	0.773	Acupuncture therapy; Cognitive impairment; Brain kidney related; The score of modified bathel index scale; Fugl Meyer motor function scale score
#6	apoplexy	16	2018	0.871	Cognitive impairment; Research progress; Nourishing kidney and marrow acupuncture; Functional connectivity; Limb motor dysfunction
#7	dysfunction	15	2010	0.971	Dysfunction; Mini mental state examination; Acupuncture to get Qi; Clinical and experimental research; Electroacupuncture Treatment
#8	effectiveness	14	2019	0.814	Cognitive function; Clinical efficacy; Swallowing function; Swallowing therapeutic apparatus; Quality of life
#9	Rehabilitation therapy	9	2012	0.972	Subject headings index; Walking ability; Functional electrical stimulation; Rehabilitation in China; Post stroke depression
#10	ischemic area	5	2013	0.995	Acupuncture therapy; Focal cerebral ischemia; New strategies; Ischemic area; Neural stem cells;

Then, taking the year of publication of the literature as the x-axis, and the cluster number and label as the y-axis, the keyword timeline map was drawn (Figure 6), in which \0 acupuncture was the keyword that appeared the earliest and had the largest time span, and the keywords such as scalp acupuncture, scalp acupuncture, Electroacupuncture and so

on successively appeared in this timeline Acupoint #1, #2 cognitive impairment, and #3 stroke began to appear in 2007 and lasted for a long time, indicating that the relevant research on the treatment of PSCI with acupuncture and moxibustion has been continuing. Baihui, shenting and other high - frequency acupoints have appeared in the timeline, as well as systematic evaluation, efficacy, mechanism and other research, indicating that the research in this field is more detailed, comprehensive and systematic.

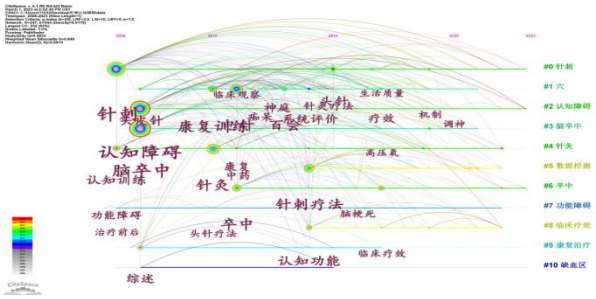

Figure 6: key words timeline

3.4.3 keyword emergence

Through the analysis of emerging keywords, we can understand the change trend of research hotspots in this research field in a certain period of time, and further predict the research hotspots in this field in the future. The emergent intensity represents the frequency of each keyword in the emergent time period, and the red area represents the emergent duration of the keyword [11]. Through the analysis of keyword emergence in the research field of acupuncture treatment for PSCI, a total of 11 keywords were monitored, as shown in Figure 7.

After eliminating the three basic words of "acupuncture therapy", "cognitive function" and "acupuncture therapy", it can be found that the prominent words from 2011 to 2015 are electroacupuncture, with a prominent intensity of 3.18, indicating that electroacupuncture is used as a common acupuncture treatment for PSCI. From 2019 to 2021, "scalp acupuncture" and "body acupuncture" emerged as characteristic acupuncture treatment methods. In 2013 and 2015, "Baihui" and "wuzangshu" acupoints (i.e., Ganshu, Xinshu, Pishu, Feishu, Shenshu in Beishu acupoint) appeared in the study for many times as common acupuncture points for the treatment of PSCI. From 2021 to 2023, the keyword "data mining" appeared, indicating that in recent years, more and more researchers have used data mining and other methods to study the treatment of PSCI with acupuncture. In addition, "systematic review" and "curative effect" as prominent keywords also indicate that the relevant research on acupuncture treatment of PSCI has been more comprehensive this year.

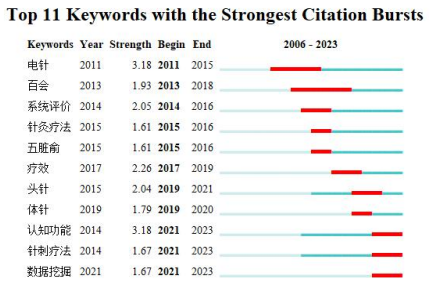

Figure 7: keyword emergence diagram

4. Discussion

Stroke, also known as cerebrovascular accident, is a local brain dysfunction caused by acute cerebrovascular disease. It is a major chronic non communicable disease that seriously endangers the health of Chinese people. This disease has five characteristics: high incidence, high disability rate, high mortality, high recurrence rate, and high economic burden [12]. Great changes have taken place in the lifestyle and eating habits of Chinese people with the gradual improvement of people's living standards. At the same time, stroke disease with increasing incidence seriously affects the quality of life of patients, and even threatens life [13]. There are many names of cognitive impairment after stroke in traditional Chinese medicine, such as "stupidity", "dementia", "forgetfulness", etc. the main symptoms are stupidity, low intelligence, forgetfulness, etc. This disease is caused by insufficient endowment, phlegm blocking orifices, liver and kidney deficiency, etc. The disease is located in the brain, and is related to the dysfunction of the heart, liver, spleen and kidney. The disease is often mixed with deficiency and excess syndrome. The basic pathogenesis is the deficiency of marrow sea and the loss of magic mechanism, so the treatment is mainly to strengthen the body and eliminate pathogens, wake up the brain and open the orifices [14]. At present, the clinical treatment of PSCI is based on Alzheimer's disease, but the curative effect is not accurate. In recent years, the research of acupuncture therapy in the field of nerve injury has gradually deepened, and it has also been widely used in the rehabilitation of cognitive dysfunction after stroke, playing a good complementary role [15]. With the gradual deepening of the relevant research on acupuncture treatment of cognitive dysfunction after stroke, the literature results are increasing. Therefore, this study visually analyzes the relevant literature in this field through CiteSpace, and discusses the current research status, hot spots and development trends in this field, in order to provide references for subsequent in-depth research.

4.1 Literature Information Analysis

Since 2006, the number of relevant literatures on acupuncture treatment of PSCI has shown a wave like upward trend. The relevant literature was first published in 2006, when the relevant knowledge of PSCI began to be popularized in the field of acupuncture, and some doctors began to use acupuncture therapy to treat related diseases. Yang Shanli and Chen Lidian from Fujian University of traditional Chinese medicine first studied the effect of acupuncture combined with cognitive function training on cognitive function of stroke patients. Song Fengjun from the rehabilitation department of Wenzhou Hospital of traditional Chinese medicine used electroacupuncture for the first time to treat stroke with cognitive dysfunction. In 2013, the team of Liu Feilai and Feng Xiaodong from Henan University of traditional Chinese medicine [16] took the lead in carrying out animal experimental research on acupuncture treatment of PSCI. Since then, the relevant animal experimental research in this field has become increasingly rich, and various research groups and institutions have also made more detailed exploration from neurotransmitters, serum factors, cerebral hemodynamics and other aspects. In addition, the methods of acupuncture intervention for PSCI have gradually diversified,

and there have also been many discussions on the compatibility of different acupoints and the clinical application of the comprehensive treatment method of acupuncture combined with other therapies and drugs. According to the author cooperation network atlas, the organization cooperation network atlas and the author and organization publication scale, Feng Xiaodong is the author with the largest number of publications, and Heilongjiang University of traditional Chinese medicine is the institution with the largest number of publications. In the research on acupuncture treatment of PSCI related fields, Fu Jianming's team and Feng Xiaodong's team belong to the early research teams in this field, and they began to study this field in 2010 and 2013 respectively. Chen Lizao's team, Zhang Hu's team and Liu Ye's team are new research teams in this field, and the time of publication is after 2015. Among them, Chen Lizao's team has the largest number of papers. Six of the top 10 authors belong to the team, and the members of the team are most closely connected. Fujian University of traditional Chinese medicine, to which the team belongs, is the second largest research institution after Heilongjiang University of traditional Chinese medicine in terms of the number of papers. Anhui University of traditional Chinese medicine, Guangzhou University of traditional Chinese medicine, Tianjin University of traditional Chinese medicine and other institutions have also made outstanding contributions to the research in this field, but the cross regional cooperation between institutions is relatively weak, and the links between different provinces are also less. In order to avoid the regional limitations of the research in this field in the future, and to maximize the benefits of domestic research on acupuncture treatment of PSCI, the close cooperation between research institutions in various regions needs to be further carried out.

4.2 Analysis of Research Content

Keyword analysis showed that among the 387 included literatures, the research on acupuncture treatment of PSCI was diversified, mainly reflected in the treatment methods, evaluation indicators and other aspects.

4.2.1 diversification of acupuncture treatment for PSCI

Through the analysis of keyword clustering, timeline map and emergence map, it can be seen that with the progress of research, more and more acupuncture methods have appeared, such as electroacupuncture, scalp acupuncture, body acupuncture, acupoint catgut embedding, etc; In addition, there have also been many characteristic multiple acupuncture techniques, such as "needling well based on differentiation of meridians", "waking the kidney and benefiting the brain" needling method, "nourishing the kidney and benefiting the marrow" needling method, "needle health" and so on.

4.2.2 acupoint diversification of acupuncture treatment for PSCI

At the same time, research on acupoints related to the treatment of PSCI disease has also made progress, among which Baihui and shenting acupoints are the most frequent acupoints. Shenting acupoint is first seen in the acupuncture and moxibustion classic A and B, which belongs to the meeting of governor vessel, foot sun and Yang Ming. It can calm the mind and wake up the brain, reduce adversity and relieve asthma, and has a therapeutic effect on the nervous system; Baihui acupoint is where the meridians and Qi converge and can contact the brain. It is an important acupoint to regulate brain function. Studies have shown that [17] shenting and Baihui acupoints combined with electroacupuncture therapy, combined with cognitive rehabilitation training, can effectively improve the cognitive function of patients after stroke and improve the ability of daily living of patients. In addition to the above two points, Chen Lizao's team [18] conducted research on the effect of acupuncture at "wuzangshu" (Ganshu, Xinshu, Pishu, Feishu, Shenshu in the back Shu acupoint) on cognitive function after stroke, and believed that acupuncture at wuzangshu combined with scalp acupuncture and cognitive function training could rapidly improve the clinical manifestations of cognitive dysfunction after stroke, improve cognition, and improve the clinical rehabilitation efficacy of patients. The selection of a small number of efficient acupoints reflects the idea of syndrome differentiation and treatment in traditional Chinese medicine, highlighting the unique advantages of simple, convenient, effective and cheap traditional Chinese medicine, which is conducive to further popularization.

4.2.3 cognitive function training is an important auxiliary means

Among the 387 retrieved literatures, there were about 101 literatures related to "cognitive function training". Most of the literatures explored the efficacy of acupuncture therapy combined with cognitive function training on PSCI. Through the review of relevant literature [19-22], it is summarized that cognitive function training can be roughly divided into the following modules: 1) attention training: including spatial structure training, visual tracking training, and reaction ability training. 2) Executive function training: including arranging assigned numbers, origami, simulated shopping, learning and recognizing road signs, etc. 3) Orientation training: including time orientation training and character concept training. 4) Memory training: instruct patients to use newspapers, calendars, cards, notepads and other tools to carry out memory training. 5) Calculation training: guide patients to carry out simple numerical calculation. In addition, there are thinking training, retelling and naming training, unilateral neglect ability training, etc. Each training should complete all the above items. The total duration of a single training is about 30min, and the frequency is once a day, five times a week, for 4 weeks.

Stroke patients with cognitive impairment often have different degrees of impairment in memory, attention, understanding and other aspects. Studies have shown that [23]: giving targeted cognitive function training to patients with PSCI while routine rehabilitation treatment can significantly improve the cognitive function of patients, help strengthen the objective understanding of patients' own problems, further promote the rehabilitation of patients' motor function, and gradually restore the state of daily life. The research results of zhangshulan, Bai Jing [24-25] and others showed that acupuncture combined with cognitive rehabilitation training can regulate the excitability of various motor nerve cells in the information transmission path, can significantly reduce the plasma cortisol content, and then can obtain more episodic

memory information. This Chinese Western combination of intervention method is conducive to improving individual cognitive function in all aspects. Therefore, the combination of acupuncture and cognitive rehabilitation training can complement each other, improve the curative effect, and accelerate the rehabilitation process [26].

5. Summary

Through CiteSpace visual analysis, this study initially showed the research trend of acupuncture in the treatment of PSCI. However, according to the published years and number of literatures, the time of publication is concentrated in the past 17 years, and the overall number of publications is small. Therefore, although the relevant research on acupuncture treatment of PSCI has made some progress, due to the complexity of the disease, this field is still an emerging research field, and the research is still in the exploratory stage. Effective scientific research information exchange platforms should be actively established among scholars, research institutions and provinces to strengthen cooperation, so as to promote the considerable development of acupuncture in the treatment of PSCI. In the future research, we should also strengthen basic research, clarify the specific mechanism of acupuncture and other traditional Chinese medicine therapies in the treatment of this disease, and provide an objective basis for the treatment of PSCI with traditional Chinese medicine.

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