

Discussion on the rule of point selection for migraine attack treatment based on data

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Abstract: The objective of this paper is to explore the clinical rule of point selection during migraine attack by data mining technology. The method applied in this paper is to search the clinical research literature on acupuncture and moxibustion in the treatment of migraine attacks collected from the establishment of the database to June 25, 2023, and to use the software to establish the acupuncture prescription database and conduct descriptive analysis. SPSS Statistics 26.0 and SPSS Model 18.0 were used for association rule analysis and cluster analysis. The results of this paper is a total of 76 acupoints were involved in 130 literatures, with a total frequency of 439 times. The top 5 acupoints were Fengchi, Ruigu, Baihui and Taiyang, and the meridians and parts with the highest frequency were Zudshaoyang bile Meridian and head and face respectively. Through the analysis of association rules, the formula with sun, rate valley, wind pond and Yanglingquan as the core was obtained. Three effective cluster groups were obtained by clustering analysis of acupoints with frequency ≥ 10 , class 1: sun-wind-wind-rate valley; Class 2: Baihui - Touwei - Hegu - Taichong; Class 3: Waiguan - Zulin - Yanglingquan. Conclusion: In the treatment of migraine attack stage, the clinical point selection is mainly based on Yang channel, pay attention to the application of far and far matching points and specific points, which reflects the basic law of "where the points are, where the indications are" and "where the meridians are, where the indications are".

1. Overview of migraine

Migraine is a very common and highly occurring disease in clinical practice, mainly caused by head vasodilation dysfunction and endocrine disorders, mainly manifested as one-sided or bilateral throbbing pain, some patients will be accompanied by nausea, vomiting, irritability and other symptom^[1]. The majority of migraine sufferers are women. Migraine belongs to traditional Chinese medicine "head wind", "Shaoyang headache", "brain wind" and other categories, the pathogenesis is not general pain, not honor pain^[2]. According to the latest research data show that migraine tends to be multiple, and the high incidence population is not limited to middle-aged and elderly women, and the prevalence rate of young people is increasing year by year. The author believes that it has a great relationship with the current life pressure, frequent behavior of staying up late, and irregular life and rest. According to the literature, there is no effective cure for migraine with traditional Chinese and western medicine, which can only relieve the symptoms. In recent years, traditional

Chinese acupuncture treatment can obtain the ideal treatment effect by selecting points according to the principle of syndrome differentiation and treatment, and coordinating with the meridian dialectic^[3].

2. Overview of migraine

2.1 Retrieval method

The clinical research literatures on acupuncture and moxibustion in the treatment of migraine were retrieved from CNKI, China Biomedical Literature Database (CBM), Wanfang Database (WF), VIP database and PubMed from the establishment of the database to June 25, 2023. Chinese or English search type: (“Stages of migraine attack”) AND (“needle” OR “acupuncture”OR“electro acupuncture”).

2.2 Inclusion criteria

① Clinical research literature on acupuncture treatment of migraine attack; ② The literature that clearly diagnosed migraine and met the diagnostic criteria of migraine; ③ Literature on acupuncture therapy as the main means of treatment or in combination with other therapies; ④ Clearly give the acupuncture points or prescriptions of the literature;⑤ Literature that clearly reports treatment effects and has data support;⑥ The primary outcome measures adopted the efficacy rating criteria used in all the included literatures.

2.3 Exclusion criteria

① For repeated publications, 1 paper was retained; ② Animal experiments, case reports, systematic reviews, academic conferences, retrospective studies, clinical case analysis without control group, expert opinions, expert experience talks, doctors' statements, etc.; ③ Literature with unclear diagnosis; ④ Literature that does not clearly give acupuncture points or prescriptions;⑤ There is no clear report of treatment effect in the literature;⑥ There is no data supporting the literature.

2.4 Data specification and extraction

The literature screening and data extraction were carried out by two researchers in strict accordance with the scheduling standard, and then cross-checked. In case of differences, they were resolved through joint discussion or ruled by a third-party authority. If there is literature related to syndrome differentiation, it should be separated and extracted according to the principle of "1 group of main points +1 group of matching points =1 group of prescriptions". The names of acupoints are standardized according to the national standard "Name and Location of acupoints" (GB/T12346-2006) ^[4]with reference to the acupoints included in the literature.For example, the norm of "renzhong" is "shuigou", and the norm of "juegu" is "xuanzhong". At last, the acupuncture prescription database was established by entering the Excel 2010 form in the order of the name of the article, the name of the acupoint, the normalization of the meridian, the location and the specific acupoint.

2.5 Data analysis

Excel 2010 was used for descriptive analysis of the frequency and numbers of acupoints, points, meridian normalization and specific points. SPSS Statistics 26.0 software was used for systematic cluster analysis of high-frequency acupoints, and SPSS Modeler18.0 software was used for association rule analysis of acupoints.

3. Result

3.1 Literature search results

306 articles were initially retrieved, 176 articles that did not meet the inclusion criteria were excluded, and 130 articles were finally included.

3.2 Acupoint frequency analysis

Among the 130 literatures, a total of 76 acupoints were used 439 times, and 18 were used ≥ 10 times, namely Fengchi, Ruigu, Baihui, Taiyang, Hegu, Waiguan, Zulin, Tou Wei, Taichong, Shi Shi, Yanglingquan, Liqi, Zao Zhu, Jiao Sun, Zhongwan, Tou Linmei, Gan Shu, Sishencong, etc. Fengchi Point was used for 47 times with a frequency of 36.15%. The second was Baihui point, which was used 26 times with a frequency of 20.00%. See Table 1 for details.

Table 1: Analysis of acupuncture points with frequency ≥ 10 times in the treatment of migraine

Serial number	acupoint	number	frequency
1	Fengchi	47	36.15
2	Baihui	26	20.00
3	Hegu	24	18.46
4	Taiyang	24	18.46
5	Shuaigu	23	17.69
6	Waiguan	18	13.85
7	Zulinqi	17	13.08
8	Touwei	15	11.54
9	Taichong	14	10.77
Serial number	acupoint	number	frequency
10	Ashixue	14	10.77
11	Yanglingquan	12	9.23
12	Lieque	11	8.46
13	Cuanzhu	11	8.46
14	Jiaosun	10	7.69
15	Zhongwan	10	7.69
16	Toulinqi	10	7.69
17	Ganshu	10	7.69
18	Sishencong	10	7.69

3.3 Analysis of frequency of point selection site

The meridians and parts of acupuncture points of 130 acupuncture prescriptions were analyzed, and the frequency data of the meridians and parts were analyzed and processed. The results showed that a total of 14 meridians were involved in the treatment of migraine attack, with a total frequency

of 390 times, the percentage was 88.84%, among which the most distributed acupoint was foot Shaoyang gallbladder Meridian, with 17 acupoints, 123 times of use, followed by Foot Sun bladder Meridian, with 12 acupoints, 130 times of use; There are 4 acupoints belonging to Jingweiqi point, namely, Sun, Shi, Shencong, neck Jiaji, etc., the frequency of use is 49, the percentage is 11.16%, indicating that Jingweiqi point also has a good effect in the treatment of migraine attacks. The temple has the highest frequency of use, which is 24 times. The site analysis showed that acupuncture treatment migraine points mainly in the head and face, there are 21 points, the total frequency of point selection is 163 times, the percentage is 37.12%, followed by the lower extremity-there are 21 points, the total frequency of point selection is 98 times, the percentage is 22.32%. The total frequency of point selection was 42 times (9.56%). For details, see Table 2 and Table 3.

Table 2: Frequency analysis of meridians belonging to acupuncture acupoints for migraine

Channels and collaterals	Times	Number of selected acupoints	Acupoint name
Foot Shaoyang gallbladder meridian	130	17	Fengchi(47),Shuaigu(23),Zulinqi(17),Toulinqi(10),Yanglinquan(12),Xuanlu(3),Wangu(3),Weizhong(3),Qiuxu(3),Xiaxi(2),Yangbai(1),Xuanzhong(1),Touqiaoyin(1),Xuanli(1),Naokong(1),Benshen(1),Jianjin(1)
Hand Shaoyang sanjiao meridian	38	7	Waiguan(18),Jiaosun(10),Sizhukong(6),Zhongzhu(1),Yemen(1),Tianmen(1),Yifeng(1)
Bladder meridian of foot sun	38	12	Cuanzhu(11),Ganshu(10),Shenshu(5),Pishu(3),Shenmai(2),Zhiyin(1),Geshu(1),Tianzhu(1),Dazhu(1),Xinshu(1),Danshu(1),Meichong(1),
Foot Yang Ming stomach channel	30	6	Touwei(15),Zusanli(5),Fenglong(4),Jiexi(4),Tianshu(1),Huaroumen(1)
Hand Yangming large intestine meridian	27	2	Hegu(24),Quchi(3)
Foot Jueyin liver meridian	18	3	Taichong(14),Xingjian(3),Qimen(1)
Hand Taiyin lung meridian	11	1	Lieque(11)
Foot Taiyin spleen meridian	9	3	Sanyinjiao(5),Xuehai(3),Gongsun(1)
Foot Shaoyin kidney channel Foot Shaoyin kidney chan	8	4	Taixi(5),Zhaohai(1),Yindu(1),Fuliu(1)
Hand jueyin pericardium meridian	8	1	Neiguan(8)
Hand Shaoyin heart meridian	6	1	Shenmen(6)
Hand sun small intestine meridian	1	1	Houxi(1)
Ren channel	20	4	Zhongwan(10),Qihai(4),Guanyuan(4),Xiawan(2)
Du channel	56	10	Baihui(26),Fengfu(9),Shenting(7),Yintang(3),Dazhui(3),Houding(3),Shangxing(2),Qianding(1),Zhiyang(1),Lingtai(1),
Odd points outside	49	4	Taiyang(24),Ashixue(14),Sishencong(10),Jingjiaji(1)

Table 3: Analysis of the distribution frequency of acupuncture points for migraine

Position	Times	Numbers	Acupoint name
Head and face	163	21	Taiyang(24), Shuaigu(23), Baihui(26), Touwei(15), Sizhukong(6), Jiaosun(10), Xuanlu(3), Sishencong(10), Yangbai(1), Toulinqi(10), Yintang(3), Cuanzhu(11), Xuanli(1), Wangu(3), Shenting(7), Touqiaoyin(1), Houding(3), Naokong(1), Benshen(1), Qianding(1), Shangxing(2), Meichong(1)
Neck	59	5	Fengchi(47), Fengfu(9), Yifeng(1), Tianzhu(1), Jianjing(1)
Upper limb	74	10	Hegu(24), Zhongzhu(1), Waiguan(18), Lieque(11), Tianjing(1), Yemen(1), Houguan(8), Houxi(1), Quchi(3), Shenmen(6)
Lower extremity	98	21	Taichong(14), Zulinqi(17), Xiashi(2), Zusanli(5), Zhiyin(1), Sanyinjiao(5), Taixi(5), Yanglinquan(12), Xingjian(3), Gongsun(1), Xuanzhong(1), Qixu(3), Fenglong(4), Shenmai(1), Zhaohai(1), Xuehai(3), Neiting(1), Jiexi(4), Fuliu(1), Zhiyin(1), Weizhong(3)
Torso	42	18	Qihai(4), Geshu(1), Guanyuan(4), Dashu(1), Dazhui(3), Huaroumen(1), Yindu(1), Zhongwan(10), Tianshu(1), Zhiyang(1), Lingtai(1), Qimen(1), Xiawan(2), Jingjiaji(1), Xinshu(1), Danshu(1), Shenshu(5), Pishu(3)

SPSS Modeler 18.0 analysis software was used to analyze association rules using the 10 points with the highest frequency (except the Ashi point), and the obtained association analysis network diagram showed that the thicker the line between any two points, the stronger the relationship between the two points, and the weaker the vice versa^[5]. Therefore, the relationship between the sun, the rate valley and the wind pool is strong.

4. Discussion

4.1 Etiology and pathogenesis of migraine

Traditional Chinese medicine believes that migraine belongs to the category of "brain wind", "headache" and "head wind", and the head is the place where Yang gathers, belongs to the "Qingyang house" and "the gathering of all Yang", and is the gathering place of the five viscera and six fu-organs and essence^[6]. Ancient doctors believe that the head wind is mostly blocked by phlegm and dampness, and then by external evil invading meridians, resulting in qi and blood stasis. Modern doctors through standardized research, that the cause of migraine is based on Yin deficiency of liver and kidney, wind, blood stasis, phlegm, heat and other latent evil as the standard, in the dysfunction or external stimulation can induce latent evil and onset^[7]. There are also many doctors who put forward their own unique views, and there are different types of dialectics. The author believes that each etiology can be a separate disease, but also can affect each other, clinical analysis, need differentiation of syndrome treatment, detailed study of the pathogenesis.

4.2 Treatment of migraine with Chinese and western medicine

At present, the treatment of migraine in Western medicine can only relieve symptoms for a short time through oral drugs, and cannot be a radical cure^[8]. At present, the commonly used Western medicine drugs are opioids, non-steroidal anti-inflammatory drugs, barbiturates,

5-hydroxytryptamine (5-HT) receptor agonists, and the remission treatment drugs include calcium channels and β -blockers, antidepressants, anti-epileptic drugs and so on. Among them, flunarizine hydrochloride is more commonly used as the second generation piperazine calcium antagonist, which has a good effect on relieving migraine and can prevent migraine recurrence to a certain extent^[9]. However, patients with long-term medication will have many adverse reactions, such as nausea, abdominal discomfort, etc., especially elderly patients with long-term application are more likely to have extrapyramidal symptoms.

In recent years, more and more researchers have proved through clinical studies that the Chinese medicine has a better effect in the treatment of migraine, and the side effects are small, and the Chinese medicine has a more obvious advantage in the treatment of migraine, and has a preventive role. Acupuncture is more effective in relieving pain^[10].

4.3 This study shows

The results of this study showed that the 18 most frequently used acupuncture points in the treatment of migraine attack were Fengchi, Ruigu, Baihui, Sun, Hegu, Waiguan, Zushi, Touwei, Taichong, Ashi, Yanglingquan, Liqi, Zhuzhu, Jiaosun, Zhongwan, Toulunmei, Ganshu, Sishencong and so on. The meridians used most frequently in the treatment of migraine attack are foot Shaoyang gallbladder meridian, the main points are Fengchi, rate valley, foot Linmei, head Linmei, Yanglingquan. Through the analysis of the parts, the acupuncture treatment of migraine attack point selection is mainly in the head and face, the main points are Yang, rate Gu, Baihui, Tou Wei, Sizhu Kong, Jiao Sun, indicating that local point selection is an important basis for acupuncture treatment of migraine points.

References

- [1] Liu Hui, Zhang Wei. Research progress of piercing therapy for migraine [J]. *Chinese Traditional Medicine Modern Distance Education*, 2023, 21(10):91-94.
- [2] Sun Xiaoyu, Wang Tianyu, Zhang Baoyun, Yang Dianhui. Research progress on the mechanism of acupuncture mediated by calcitonin gene-related peptide in the treatment of migraine [J]. *Clinical Journal of Acupuncture and Moxibustion*, 2021, 37(6):92-96.
- [3] Zhang Youwei. Observation on curative effect of Buyang Huanwu Decoction and Buzhong Yiqi Decoction in treating acute cerebral infarction [J]. *Journal of Practical Chinese Medicine*, 2019, 35(11):1363-1364.
- [4] Tan Yaqin, Ma Xiting, Wang Qi, et al. Investigation on the application of the national standard "Name and Location of acupoints" (GB/T 12346-2006) [J]. *Chinese Acupuncture and Moxibustion*, 2016, 36(8):871-874.
- [5] Li Guoqiang. Study on prescription rule of acupuncture therapy for migraine based on data mining technology [D]. Jinan: Shandong University of Traditional Chinese Medicine, 2018.
- [6] Xiao Jiwen. Analysis of TCM internal medicine treatment of migraine [J]. *Famous Doctor*, 2020(4):235
- [7] Li Dandan. Research progress in the treatment of migraine [J]. *Chinese Community Physician*, 2019, 35 (9): 7-8.
- [8] Zhang Shuxian, Xiao Caixia. Clinical observation of Yangxue Pinggan Decoction combined with flunarizine in treatment of migraine [J]. *Journal of Practical Chinese Medicine*, 2023, 39(03):537-539.
- [9] Tong Shuwen, Li Wentao. Research progress of TCM treatment of migraine [J]. *Modern Distance Education of Chinese Medicine*, 2019, 17(21):134-137.
- [10] Cheng Shuang, Shi Huifen. A Summary of experience in TCM treatment of Migraine [J]. *Jilin Chinese Medicine*, 2013, 33 (5): 457-459.