

Discussion on the Academic Thought of "Jingyue Quanshu Phlegm Drinks" and the Law of its Use of Medicines

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Abstract: In order to explore the pattern of Zhang Jingyue's prescriptions on the treatment of phlegm retention and the academic thought of treating phlegm retention. This article collected the prescriptions in Jingyue Quanshu phlegm retention set up databases, determined the four characters (FC), five tastes (FT) and channel distributions of herbs and Drug frequency and dosage. Resultly, a total of 111 prescriptions which met the inclusion criteria were screened out, containing a total of 168 traditional Chinese medicines. We found that medicines with high frequency were Banxia, Fuling, Chenpi, Baizhu, Gancao, Renshen, Shengjiang, Shudihuang, etc. analyzed the commonly used compatibility drug pairs, core drug combination 29 groups, 7 related rules and 8 new prescriptions. Thus, Zhang Jingyue pays attention to safeguard Promordial Qi, simultaneous application of cooling and tonifying, Maintain Yin and Yang, distinguishes relative importance or urgency, emphasizes regulating spleen and kidney.

Keywords: Jingyue's Complete Works; Phlegm-Drink; Safeguard Promordial Qi; Academic thoughts; Medication regularities

1. Introduction

The "phlegm" described by traditional Chinese medicine is the pathological product of body fluid metabolism disorders and qi and blood stasis. It is characterized by poor flow, stickiness, foul secretion, Accumulation of condensation, Pathogenic weirdness. And it also has the characteristics of disturbing the mind, Blocking the flow of blood, blocking the brain, leading to tumor formation by the Accumulation^[1]. There were first records of "water drinking" and "Ji drinking" in the Neijing. Zhang Zhongjing of the Eastern Han Dynasty in his Synopsis of the Golden Chamber pioneered the name of phlegm drinking disease, but it has its limitations detailed in drinking and slightly in phlegm. In the theory of various diseases described the etiology, pathogenesis and types of sputum in detail. renzhai zhi zhi fang pointed out that "phlegm and drinking, by self, its shape is also different, the nature of phlegm is viscous, drinking is water"^[2]. Zhang Jingyue's discussion on phlegm retention is detailed and thorough. He advocated that phlegm retention and body fluid are of the same origin, both of which are changed by cereal essence. If it is positive, it will be collected in the blood gas, strong body, and supplement the battalion and Ying-wei. If it is not positive, it will cause the disease of zangfu, and the imbalance of body fluid will lead to phlegm and salivation^[3]. Zhang believed that although phlegm and drink belong to the same species, their essence is also different. Drinking is a kind of water dampness, its texture is clear and thin, mostly due to the feeling of cold dampness, lost in transport by the spleen and stomach, or stay in the limbs, chest and skin. Phlegm is mainly composed of condensed body fluid, its quality is thick and sticky, and it is often caused by feelin of the fire and heat. It can be produced even if the five viscera are damaged, and it can be found everywhere with the rise and fall of human qi^[4]. The disease of phlegm retention can occur repeatedly, and even spread to the whole body, showing symptoms such as wheezing, chest tightness, vomiting, limb numbness, head dizziness, and so on. It is inseparable from the five zangfu, nine orifices and three jiao of human body. According to modern medicine, phlegm turbidity is closely related to obesity, hyperlipidemia, abnormal carbohydrate metabolism, and abnormal hemorheology, and accumulation drink is close to airway mucus

hypersecretion, pleural effusion, and pericardial effusion in respiratory diseases [5].

2. Data and methods

2.1. Data Collection and Specifications

Collect the prescriptions involved in JingYueQuanShu · phlegm retention, and the name of the drug in the prescription shall uniformly refer to the Chinese Pharmacopoeia. For example, "wheat gate winter" is unified as "wheat winter", "white Poria" cocos" is "Poria", "raw licorice" is unified as "licorice" and so on.

2.2. Data processing and verification

Using Office Excel 2019, the database of 111 prescriptions was established according to the software requirements. And upload the data to the "TCM inheritance computing platform V3. 0". In order to avoid possible errors in the single entry, after all the entry, two people will check the input data to ensure the correct data.

3. Results and analysis

3.1. Frequency of medication

Statistics on the frequency of 111 prescriptions in JingYueQuanShu · phlegm retention. The drugs with frequency ≥ 8 were imported into the Excel table and the following conclusions were drawn, Drugs with frequency ≥ 8 had 20 flavors, as shown in Table 1.

Table 1: Analysis of medication frequency in JingYueQuanShu · phlegm retention (frequency ≥ 8)

order number	medicinal	frequency	order number	medicinal	frequency
1	Pinellia ternata	50	11	Radices saussureae	11
2	Poria cocos	47	12	Rhizoma alismatis	11
3	Pericarpium citri reticulatae	39	13	Bile arisaema	10
4	Bighead atractylodes rhizome	34	14	Angelica sinensis	10
5	Liquorice	30	15	Rhizoma zingiberis	10
6	Ginseng	27	16	Rhizoma arisaematis	10
7	Ginger	27	17	Fructus aurantii immaturus	9
8	Prepared licorice	22	18	Syzygium aromaticum	9
9	Radix rehmanniae praeparata	19	19	Fructus ziziphi jujubae	8
10	Scutellaria baicalensis	11	20	Cinnabar	8

3.2. Four Gas, five flavors and channel tropism

By analyzing the summary of each flavor of medicine, we can derive the distribution of all the four gas, five flavors and channel tropism, export the results to Excel, and draw a radar chart. The results showed that warm Chinese drugs were applied the most (367 times), followed by flat (146 times) and cold (125 times), see Figure 1; pungent Chinese drugs were applied the most (358 times), followed by sweet (312 times) and bitter (311 times), see Figure 2; Chinese drugs attributed to the spleen meridian were applied the most (501 times), followed by the lung meridian (452 times) and the stomach meridian (309 times), see Figure 3.

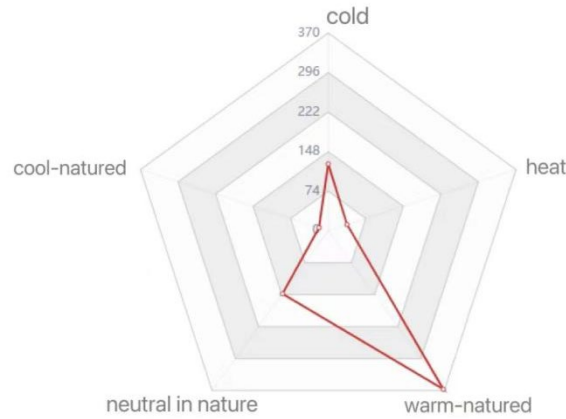


Figure 1: Four Gas Statistical Radar Chart

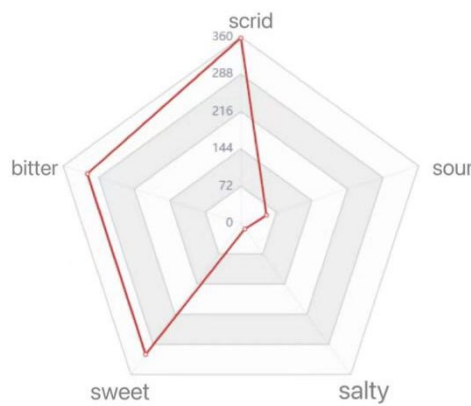


Figure 2: Five Flavors Statistical Radar Chart

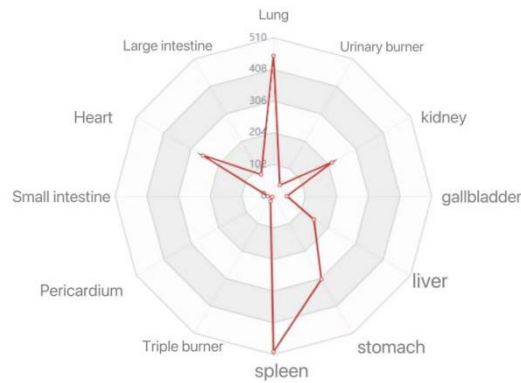


Figure 3: Channel tropism Statistical radar Chart diagram

3.3. Efficacy statistics

The efficacy frequency of the drugs used in the 111 prescriptions was counted, and the results were exported to Excel to draw the bar chart, as shown in Figure 4.. The analysis results show that: The deficiency supplementing formula were used most frequently, followed by phlegm-expelling formula (107 times) and carminative formula(85 times).

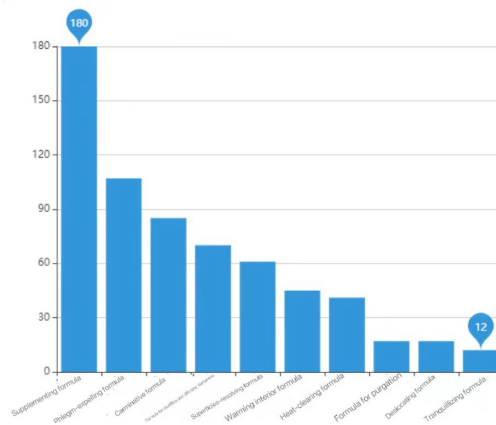


Figure 4: Efficacy statistics

3.4. Analysis of square rules based on association rules

The "number of support" was set to 11, and the confidence level was set to 0.8. 29 groups of drug combinations with frequency ≥ 11 were obtained, and the results are shown in Table 2, and the core drug combinations were networked and displayed in Figure 5. 7 association rules with confidence level $\geq 80\%$ were obtained, and the results are shown in Table 3.

Table 2: Analysis of core combinations of medicines used in Jing Yue Quan Shu - Phlegm Drink (support ≥ 11)

No.	Drug combinations	Frequency	No.	Drug combinations	Frequency
1	Pinellia ternata, pericarpium citri reticulatae	26	16	pericarpium citri reticulatae, Radix Glycyrrhizae Preparata	13
2	Poria cocos, pericarpium citri reticulatae	26	17	Poria cocos, pericarpium citri reticulatae, liquorice	13
3	Pinellia ternata, Poria cocos	26	18	Rhizoma Atractylodis Macrocephalae, liquorice	13
4	Poria cocos, Rhizoma Atractylodis Macrocephalae	24	19	Rhizoma Atractylodis Macrocephalae, Dried Ginger	12
5	Poria cocos, liquorice	20	20	Poria cocos, pericarpium citri reticulatae, Rhizoma Atractylodis Macrocephalae	12
6	Pinellia ternata, ginger	19	21	pericarpium citri reticulatae, Radix Glycyrrhizae Preparata	12
7	Pinellia ternata, Poria cocos, pericarpium citri reticulatae	19	22	Poria cocos, pericarpium citri reticulatae, ginseng	12
8	Poria cocos, ginseng	18	23	Pinellia ternata, Poria cocos, liquorice	12
9	Rhizoma Atractylodis Macrocephalae, ginseng	18	24	Poria cocos, Radix Glycyrrhizae Preparata	12
10	pericarpium citri reticulatae, liquorice	16	25	Pinellia ternata, Dried Ginger	11
11	Pinellia ternata, liquorice	15	26	Poria cocos, Rhizoma Atractylodis Macrocephalae, liquorice	11
12	Poria cocos, Rhizoma Atractylodis Macrocephalae, ginseng	15	27	Pinellia ternata, ginseng	11
13	pericarpium citri reticulatae, Rhizoma Atractylodis Macrocephalae	15	28	liquorice, ginseng	11
14	pericarpium citri reticulatae, ginseng	14	29	pericarpium citri reticulatae, ginger	11
15	Poria cocos, ginger	13			

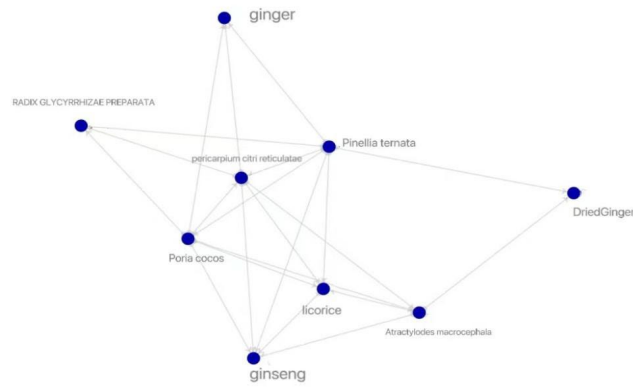


Figure 5: Network diagram of medication combination core associations (support 11, confidence 0. 8)

Table 3: Analysis of medication association rules (80% confidence)

No.	Rules	confidence level
1	pericarpium citri reticulatae, ginseng->Poria cocos	0. 86
2	Rhizoma Atractylodis Macrocephalae, liquorice->Poria cocos	0. 85
3	Rhizoma Atractylodis Macrocephalae, ginseng->Poria cocos	0. 83
4	Poria cocos, ginseng->Rhizoma Atractylodis Macrocephalae	0. 83
5	pericarpium citri reticulatae, liquorice->Poria cocos	0. 81
6	pericarpium citri reticulatae, Rhizoma Atractylodis Macrocephalae->Poria cocos	0. 8
7	Pinellia ternata, liquorice->Poria cocos	0. 8

3.5. Analysis of new prescriptions based on K-means clustering

The "number of clusters (K)" was set to 4, and the extracted combinations yielded 4 possible potential core drug combinations. The results are shown in Table 4. The schematic diagram of K-means algorithm and regression model is shown in Figure 6.

Table 4: New combinations of medicine clustering analysis in Jing Yue Quan Shu - Phlegm Drink

No.	New combination
1	Pinellia ternata, Poria cocos, Rhizoma Atractylodis Macrocephalae, pericarpium citri reticulatae, liquorice, ginseng
2	ginger, Pinellia ternata, rhizoma arisaematis, Poria cocos, pericarpium citri reticulatae, Radix Glycyrrhizae Preparata
3	ginseng, Radix Glycyrrhizae Preparata, Poria cocos, Angelica sinensis, Rhizoma Atractylodis Macrocephalae
4	arisaema cum bile, rheum officinale, kanziol, semen armeniacae amarae, semen brassicae, bezoar

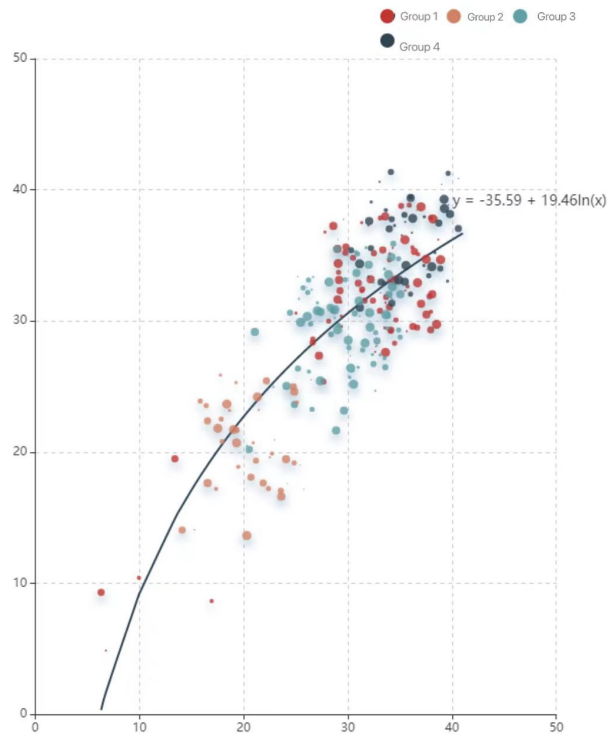


Figure 6: Cluster analysis regression model Fig

4. Discussion

To sum up the results of this study, the main ideas of Jing Yue's treatment of phlegm drink are: reinforcing premodial qi, simultaneous application of cooling and tonifying therapy, Yin and Yang mutual aid, Disease presentation and root cause are not treated simultaneously, warmly invigorating spleen and stomach.

Jing Yue's treatment of phlegm focuses on nourishing vitality, if it is strong, the phlegm will be less, if the vitality is declined the cereal essence and body fluid can become phlegm [6]. It is important to distinguish the essence of vitality, Strong vitality, the spleen and stomach can be transported properly, Making the water and grain essence micromatter into qi, blood and body fluidtransfusion in the whole body. As is known to all, the lung plays an important role in the transportation of phlegm and drinking. Combined with the combination of high-frequency medication, we can understand the idea of Jingyue. Those who damage the lung should be given qitonic drugs, and the lung qi is full, and the remaining dirty gas is flourishing. And modern studies show that ginseng has the effect of improving memory, anti-aging and regulating immunity [7]. In addition, the wide use of licorice, hot licorice, its taste to sweet, cool and warm. Pharmacological studies show that licorice has anti-tumor, anti-inflammatory sterilization, anti-virus, anti-heart failure, immune regulation and anti-fibrosis [8].

Pay attention to the use of cleaning and supplementing, has been certified by many scholars [9-10], The phlegm drinking described in Zhongjing is actually a drinking certificate, He put forward "sick phlegm drink, should warm medicine and it" for the later treatment of phlegm drink. Pinellia pinellia and tangerine peel compatibility can warm phlegm drinking, clinical commonly used to treat cough phlegm, qi nausea and other evidence, Pinellia pinellia [11] has significant antitumor effects, while tangerine peel [12] has good effects on lowering blood lipid and reducing phlegm. Combined with heat-clearing drugs, such as Scutellaria baicalensis in high-frequency drugs, its taste is bitter and cold, qi is light than taste, bitter than cold, which belongs to the micro Yang in Yin. Many studies [13] have shown that baicalein, Han baicalein and its glycosides have pharmacological activities such as anti-tumor, anti-virus, anti-inflammatory, antioxidant, liver protection and neuroprotection.

Pay attention to the harmony of Yin and Yang. The treatment of Yang deficiency, The medicine of tonifying kidney and nourishing essence is equipped with nourishing qi and warming Yang medicine to achieve the effect of harmonizing Yin and Yang. Pharmacological studies [14] show that the active

ingredients of Prepared rehmannia have the function of anti-aging and enhancing body immunity. This not only reflected Jing Yue's thought of cultivating and reinforcing Yin essence, but also reflected his wonderful principle of the mutualism of Yin and Yang. Just as Jing Yue said, "The use of nourishing Yin is the cultivation of Yang. The best way to help Yang is to cultivate Yin and Yang" [15].

The treatment of phlegm should investigate the deficiency and treat both the symptoms and the root cause [16]. Solid phlegm disease light shallow, to go quickly, insufficient for fear, and empty phlegm always by the deficiency of the viscera, gradually become, the disease is difficult to treat, remove also slow. Through the analysis of core drug combination and association rules, Jingyue makes good use of four gentleman soup for virtual phlegm, Studies [17] have shown that sijunzi decoction has pharmacological effects on promoting the absorption of intestinal nutrients and improving body immunity. And the man is young and strong, Or because of the wine and meat thick taste, or because of the physical gas hot and heat, or because of wind resistance closed muscle Cou, or because of the liver gas on the reverse obstruction, causing phlegm drink, its vitality is full, appropriate elimination, can be attacked. Witness its thought [18] "without deficiency evidence and phlegm, dispel its damp stagnation phlegm since clear, appropriate two Chen soup Lord". Modern studies [19] believe that, phlegm and dampness is the pathological factor of metabolic diseases, and erchen soup can intervene in the process of metabolic diseases through dryness, dampness and phlegm.

All five viscera can produce phlegm, but the source of phlegm is nothing more than spleen and kidney, High-frequency traditional Chinese medicine, poria cocos, sweet and light taste, flat qi. Sex drop and infiltration, Yang in the Yin also. atractylodes, sweet taste, temperature, Yin in Yang, blood in gas. Its nature is warm and dry, so it can replenish qi and replenish Yang and blood, warm stomach and valley, benefit jin fluid, long muscles, solid spleen and stomach, dehumidification and transport phlegm. Atractylodes macrocephala, sweet and pungent in taste, is warm, with yin in yang and blood in qi. It is warm and dry in nature, so it can benefit the qi and nourish the yang and generate blood, warm the stomach and eliminate grain, benefit the fluids, grow muscles, strengthen the spleen and stomach, remove dampness and transport phlegm, eliminate floating and dispel swelling. Pharmacological research points out that [20] Poria cocos can strengthen the spleen by intervening intestinal flora, while Rhizoma Atractylodis Macrocephalae [21] has the function of protecting liver, regulating immunity and spleen and stomach. Therefore, the first phlegm warm spleen strong kidney, phlegm is not treated and go.

Four new prescriptions were obtained based on K-means clustering analysis: (1) Pinellia ternata-Poria cocos-Rhizoma Atractylodis Macrocephalae-pericarpium citri reticulatae- liquorice-ginseng, (2) ginger-Pinellia ternata-rhizoma arisaematis-Poria cocos-pericarpium citri reticulatae-liquorice, (3) ginseng-liquorice-Poria cocos-Angelica sinensis-Fructus Ziziphi Jujubae-Rhizoma Atractylodis Macrocephalae, (4) arisaema cum bile-rheum officinale-kanziol-semen armeniacae amarae-semen brassicae-bezoar.

In this paper, the author shows the medication rule of Zhang Jingyue to treat phlegm retention. The author's research on the treatment of sputum drinking disease is still unsatisfactory. First of all, the cognitive aspect is relatively narrow, mostly theoretical expression, and the lack of in-depth analysis and summary in the specific application. Secondly, Zhang Jingyue's overall academic thought is inseparable. This research is devoted to the book of Jingyue Quanshu, which ignores the mining and analysis of the relevant contents of Zhang's other works, and more attention should be paid to the internal relevance of his academic thoughts.

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