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Analysis of the Therapeutic Effect of ZhenGan XiFeng Decoction in the Acute Phase of Hypertensive Intracerebral Hemorrhage

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Abstract: *Objective:* To analyze the therapeutic effect of ZhenGan XiFeng Decoction in patients with hypertensive intracerebral hemorrhage (HICH) in the acute phase. *Methods:* Fifty-seven patients with HICH in the acute phase who visited the hospital from April 2024 to March 2025 were selected as samples and randomly divided into two groups. Group A received combined therapy with ZhenGan XiFeng Decoction, while Group B received conventional treatment. The efficacy, blood pressure, and symptom scores were compared between the two groups. *Results:* The effective rate of HICH patients in Group A was higher than that in Group B ($P < 0.05$). The SBP and DBP indicators of HICH patients in Group A were lower than those in Group B ($P < 0.05$). The symptom scores of HICH patients in Group A were lower than those in Group B ($P < 0.05$). *Conclusion:* The use of ZhenGan XiFeng Decoction in the treatment of acute HICH can enhance the effect of HICH management, stabilize blood pressure, and also relieve HICH-related symptoms.

Keywords: Hypertensive intracerebral hemorrhage; ZhenGan XiFeng Decoction; Therapeutic effect

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1. Introduction

HICH refers to a series of pathological changes caused by long-term abnormal elevation of blood pressure, which leads to degeneration, necrosis, or the formation of micro-aneurysms in intracranial small arteries. If the blood pressure rises abnormally, it can cause intracranial small vessel rupture and bleeding, which is a parenchymal lesion of the brain. Western medicine often treats HICH with symptomatic drug therapy, which can adjust intracranial pressure and correct water-electrolyte imbalance. However, if the indications for hematoma removal surgery are met, a surgical plan is needed to completely remove the hematoma. According to dialectical analysis of traditional Chinese medicine, HICH patients mostly belong to the type of liver yang hyperactivity, and need to be treated with prescriptions for removing blood stasis, promoting blood circulation, detoxifying, resolving phlegm, and calming the wind. The commonly used prescription is ZhenGan XiFeng Decoction [1]. Based on this, this study analyzes the therapeutic effect of ZhenGan XiFeng Decoction using 57 patients with HICH who visited the

hospital from April 2024 to March 2025 as samples.

2. Materials and methods

2.1. Materials

Fifty-seven patients with acute HICH who visited the hospital from April 2024 to March 2025 are selected as samples and randomly divided into two groups. There is no statistically significant difference in the baseline data of acute HICH between Group A and Group B ($P > 0.05$), as shown in **Table 1**.

Table 1. Baseline data analysis of acute HICH

Group	n	Gender(%)		Age (years)		Hematoma volume(ml)		BMI(kg/m^2)	
		Male	Female	Range	Mean	Range	Mean	Range	Mean
Group A	29	15(51.72)	14(48.28)	45–82	68.21 ± 1.25	3–30	22.09 ± 1.81	19–27	23.81 ± 1.82
Group B	28	14(50.00)	14(50.00)	46–79	68.19 ± 1.31	3–30	22.11 ± 1.79	19–28	23.79 ± 1.79
X^2/t	-	0.0169		0.0590		0.0419		0.0418	
P	-	0.8964		0.9532		0.9667		0.9668	

2.2. Inclusion and exclusion criteria

The inclusion criteria of the study are: (1) Consistent with cerebral hemorrhage in the "Key Points for the Diagnosis of Various Cerebrovascular Diseases" [2], and dialectical analysis in traditional Chinese medicine indicates liver yang hyperactivity syndrome; (2) CT suggests cerebral hemorrhage; (3) Presence of hypertension; (4) Hematoma volume less than 30ml and GCS (Glasgow Coma Scale) score greater than 8.

Meanwhile, the exclusion criteria are: (1) Intracranial hemorrhage caused by trauma; (2) Drug-induced intracranial hemorrhage; (3) Non-liver yang hyperactivity syndrome; (4) Hematoma volume greater than 30ml and GCS score less than or equal to 8.

2.3. Treatment methods

Group A received conventional treatment, including blood pressure control, reduction of cerebral edema, stabilization of the internal environment, combined with ZhenGan XiFeng Decoction. The prescription is as follow: 30g each of raw oyster shell, raw keel, and Huai Niu Xi; 15g each of Tian Dong, Xuan Shen, Bai Shao, raw tortoise shell, and raw Dai Zhe stone; 10g of Yin Chen; 5g each of raw malt, Chuan Lian Zi, and licorice. The prescription can be adjusted according to the patient's other symptoms. All herbs are decocted in water to obtain 300ml of juice, taken once a day, warm, in the morning, afternoon, and evening. The medication is administered for 1 week.

Group B received conventional treatment, including blood pressure control, reduction of cerebral edema, and stabilization of the internal environment.

2.4. Observation indicators

(1) Efficacy: Stable blood pressure and blood sugar, no expansion of the hematoma, no psychiatric symptoms, no reversal of sleep, no aggravation of neurological damage symptoms, recorded as effective; BI index decreased, hematoma expanded, neurological damage symptoms aggravated, recorded as ineffective.

(2) Blood pressure: Monitor SBP and DBP using an arm-type blood pressure monitor.

(3) Symptom score: Score symptoms such as hyperglycemia, psychiatric symptoms, sleep disorders, independent eating, deepened consciousness, and decreased muscle strength based on the criteria of none, mild, moderate, and severe, with scores ranging from 0–3.

2.5. Statistical analysis

SPSS 23.0 is used to process the data. The X^2 test and % are used to record count data, while the t-test and $\bar{X} \pm s$ are used to record measurement data. Statistical differences exist when $P < 0.05$.

3. Results

3.1. Efficacy of HICH patients

The effective rate of HICH patients in Group A was higher than that in Group B, with $P < 0.05$. The results are shown in **Table 2**.

Table 2. Comparison of therapeutic effects (n,%)

Group	Effective rate	Ineffective rate
Group A (n=29)	28(96.55)	1(3.45)
Group B (n=28)	22(78.57)	6(21.43)
X^2	4.2752	
P	0.0387	

3.2. Blood pressure of HICH patients

After medication, the SBP and DBP indicators of HICH patients in Group A were lower than those in Group B, with $P < 0.05$. The results are illustrated in **Table 3**.

Table 3. Comparison of blood pressure ($\bar{X} \pm s$)

Group	SBP(mmHg)	DBP(mmHg)
Group A (n=29)	136.42 ± 1.82	84.44 ± 1.06
Group B (n=28)	145.11 ± 1.96	97.06 ± 1.19
t	17.3537	42.3135
P	0.0000	0.0000

3.3. Symptom scores of HICH patients

After medication, the symptom scores of HICH patients in Group A were lower than those in Group B, with $P < 0.05$. Refer **Table 4** for the details.

Table 4. Comparison of symptom scores ($\bar{x} \pm s$)

Group	Hyperglycemia (score)	Psychiatric symptoms (score)	Sleep disorder (score)	Independent eating (score)	Deepening of consciousness (score)	Muscle strength decline (score)
Group A (n=29)	0.49 ± 0.11	0.52 ± 0.14	0.44 ± 0.15	0.51 ± 0.16	0.42 ± 0.12	0.47 ± 0.14
Group B (n=28)	1.31 ± 0.28	1.36 ± 0.31	1.35 ± 0.32	1.35 ± 0.29	1.33 ± 0.27	1.36 ± 0.28
t	14.6473	13.2616	13.8247	13.6034	16.5406	15.2586
P	0.0000	0.0000	0.0000	0.0000	0.0000	0.0000

4. Discussion

HICH is a disease with high incidence in middle-aged and elderly populations, characterized by acute onset and high disability rate, and most patients have poor prognosis. Cerebral edema after HICH can alter the physiological and anatomical structure of craniocerebral tissues, increasing the risk of patient fatality, so active treatment should be provided. Scholars of traditional Chinese medicine believe that HICH belongs to the category of stroke and is related to the poor flow of Qi in the six hollow organs. The internal obstruction of wind, yang, phlegm, and fire leads to the disturbance of Qi movement. Over time, pathogenic Qi rises and attacks the brain, causing the disease. There are many inducements of HICH, and patients often experience attacks during emotional excitement, overexertion, excessive anxiety, and heavy lifting. These influencing factors cause Yin-Yang imbalance and Qi-blood disturbance, leading to the onset of the disease [3].

Additionally, under the influence of various underlying diseases such as vascular diseases, atherosclerosis, and hypertension, blood pressure can suddenly rise, causing blood vessels to rupture and inducing cerebral hemorrhage. This generates intracranial edema, which increases pressure on craniocerebral tissues, leading to displacement, softening, necrosis of healthy intracranial tissues, and ultimately inducing HICH. Scholars of traditional Chinese medicine have found that patients with acute HICH experience blood stasis. During treatment, it is necessary to quickly resolve the state of edema and reduce local intracranial tissue compression, with a focus on removing blood stasis rather than stopping bleeding. Therefore, dialectical selection of traditional Chinese medicines should be made to regulate blood viscosity, reduce the degree of cerebral edema, improve cerebral blood circulation, and reduce the degree of nerve fiber bundle damage in HICH patients [4]. The HICH patients included in this study all presented with hyperactivity of liver yang syndrome, and were treated with Zhen Gan Xi Feng Decoction. The combined use of the herbs in the formula can guide qi and blood downward, alleviating HICH-related symptoms.

Based on the data analysis in this study, the effective rate of HICH patients in Group A is higher than that in Group B, with $P < 0.05$. Analyzing the reasons, in the Zhen Gan Xi Feng decoction, Radix Cyathulae is the monarch drug that can nourish the liver and kidneys, stabilize Qi and blood turbulence, and guide blood downward. Raw haematite is also a minister drug that can calm the liver and suppress yang, reducing the liver yang rising and causing adverse Qi of liver and stomach; further studying the etiology of HICH, using raw oyster with other drugs such as white peony root, tortoise plastron, raw dragon bone, etc., to calm the wind, soften the liver, descend the adverse Qi, and suppress yang, all of which are minister drugs. *Asparagus cochinchinensis*

is paired with figwort root to nourish water, clear heat, and nourish yin; the liver has characteristics of hating depression and liking harmony. If only heavy sedative drugs are selected, it can inhibit its harmonious nature. When paired with malt sprout, sichuan chinaberry fruit, and *capillaris*, it can regulate Qi, disperse the liver, and also reduce liver heat and suppress liver Yang. The above drugs are all adjuvant drugs [5].

Licorice can adjust the medicinal properties of various medicines in Zhen Gan Xi Feng decoction. When paired with malt sprout, it can regulate the middle burner and harmonize the stomach, and can inhibit the disadvantages of stone drugs. It is a guiding drug [6]. Zhen Gan Xi Feng decoction focuses on the treatment of symptoms with sedative drugs, and at the same time selects nourishing Yin products to treat the root cause, which can achieve the effect of taking care of both the symptoms and the root cause. In addition, the combination of various medicines in Zhen Gan Xi Feng decoction can achieve the effect of nourishing Yin and suppressing Yang, calming the liver and extinguishing wind. Another set of data shows that the SBP and DBP indicators of HICH patients in Group A are lower than those in Group B, with $P < 0.05$. Based on modern pharmacological analysis, raw dragon bone, raw oyster, etc. in Zhen Gan Xi Feng decoction are rich in magnesium, calcium, and other elements, which can regulate the membrane potential of vascular smooth muscle cells, block calcium ion influx, and reduce vascular tension. Moreover, oyster extracts can inhibit the RAAS system and lower SBP; Radix Cyathulae is rich in polysaccharides and triterpenoid saponins, which can stimulate the expansion of peripheral blood vessels, improve vascular compliance, and thus lower blood pressure; raw haematite is rich in magnesium, iron and other elements, which can regulate calcium ion channels, block sympathetic excitation, and help maintain stable blood pressure and heart rate [7].

Another set of data indicates that the symptom scores of HICH patients in Group A were lower than those in Group B, with $P < 0.05$. Upon analysis, the reason for this difference is related to hyperglycemia and the impairment of central nervous system function in HICH patients, which causes the body to enter a stress state. At this time, the secretion of cortisol and epinephrine increases in the patients' bodies, which can antagonize the effects of insulin and accelerate the decomposition of glycogen in the liver. Additionally, under severe stress response conditions, the body's tissues become less sensitive to insulin, leading to elevated blood glucose levels. Psychiatric symptoms are related to the signs of brain edema compression. In HICH patients, increased intracranial pressure and impaired cranial function can induce psychotic symptoms such as delusion, hallucinations, and irritability. Coupled with the influence of cranial neurotransmitter release and metabolic disorders, these psychiatric symptoms can be further exacerbated.

Sleep disorders are related to damage to the brain's sleep regulation center, leading to abnormalities in the sleep-wake rhythm, manifesting as dreaminess, easy waking, and difficulty entering deep sleep. Autonomous eating disorders are associated with brain edema damaging swallowing nerve function, causing patients to fear eating due to choking, and a few severely ill patients may be in a coma and unable to eat independently. Deepened consciousness is related to the continuous increase in intracranial pressure, which further impairs cranial function, manifesting as delirium, agitation, and coma. Muscle weakness is related to brain edema damaging nerve conduction pathways and neurons [8]. In addition, severely ill HICH patients who are bedridden for long periods and have reduced physical activity may experience muscular atrophy due to disuse, leading to decreased muscle strength.

In this study, Zhen Gan Xi Feng decoction is chosen for treatment. Drugs such as Radix Scrophulariae and Radix Asparagi are rich in polysaccharides and saponins, which can resist platelet accumulation and lower blood pressure. Additionally, the extract of Radix Asparagi can prolong PT and APTT times, which is beneficial for

restoring blood circulation. The total glycosides of white peony root can block the proliferation of smooth muscle cells, delay atherosclerosis, and reduce cerebral vascular reperfusion injury, thereby reducing the volume of brain edema and relieving HICH-related symptoms. The capillarisin in Yin Chen can promote cerebral blood circulation, accelerate cerebrovascular expansion, and correct insufficient cerebral perfusion. Therefore, HICH patients have a good prognosis, and various symptoms quickly resolve. In addition, the raw tortoise shell in Zhen Gan Xi Feng Decoction contains amino acids and collagen, which can stimulate the repair of damaged nerve cells.

Moreover, extracts from the tortoise shell can inhibit neuronal apoptosis and reduce damage to craniocerebral nerve tissues. Raw malt contains vitamins of the B group and maltase, which can regulate neurotransmitter metabolic pathways and accelerate the repair of damaged nerve cells. Extracts from Sichuan chinaberry can protect craniocerebral neurons and inhibit intracranial calcium overload. Extracts from licorice can block the release of inflammatory factors in the body, reduce the stress response in patients with acute HICH, and help patients recover their self-care ability. Herbs such as Yin Chen and raw ochre can reduce oxidative stress damage in the body, and the chlorogenic acid in Yin Chen can block the process of platelet activation, inhibit the generation of blood clots in the body, and further reduce patient discomfort [9].

However, patients with acute HICH should avoid taking tetracycline drugs during treatment with Zhen Gan Xi Feng Decoction, as it may adversely affect the absorption of mineral medicines such as raw oysters and raw ochre. The dosage of each medicine should be adjusted dynamically based on the patient's physical condition. During medication, blood pressure should be monitored to avoid the effects of hypotension on cerebral perfusion, and neurological function recovery, including language, consciousness, and limb movements, should be evaluated. If unequal pupils or severe consciousness disturbances occur, medication should be immediately suspended and re-examined. If dizziness, headache, nausea, and vomiting occur, the drug dosage should be adjusted dialectically [10].

5. Conclusion

In summary, treatment with Zhen Gan Xi Feng Decoction for patients with acute HICH can enhance the efficacy of acute HICH management, maintain stable blood pressure, and reduce HICH-related symptoms, making it worthy of promotion. However, due to the small sample size of acute HICH included in this study, there may be some randomness in the data on the effectiveness of Zhen Gan Xi Feng Decoction. Future studies should increase the sample size of acute HICH and conduct multi-center investigations to further explore the therapeutic effects of Zhen Gan Xi Feng Decoction.

Disclosure statement

The author declares no conflict of interest.

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