

Clinical Efficacy of Banxia Baizhu Tianma Decoction in Patients with Turbid Phlegm Blocking Orifice Syndrome of Alzheimer's Disease



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Abstract: Objective: To evaluate clinical efficacy of Banxia Baizhu Tianma (BBT) decoction in the treatment of patients with turbid phlegm blocking orifice (TPBO) syndrome of Alzheimer's diseases (AD). Methods: The patients with TPBO syndrome of AD admitted to the Department of Neurology, Shandong Jynan County Traditional Chinese Medicine Hospital from October 2021 to October 2022 were selected and randomly divided into the control group treated with conventional therapy including donepezil hydrochloride and the observed group combined with BBT decoction on the basis of control group for 8 weeks. The scores of Mini-Mental State Examination (MMSE), Montreal Cognitive Assessment (MoCA), Clinical Dementia Rating (CDR), Global Deterioration Scale (GDS), Activity of Daily Living Scale (ADL), Cohen-Mansfield Agitation Inventory (CMAI) and Traditional Chinese Medicine Syndrome Score (TCMSS) were estimated before and after treatment, so that to evaluate clinical efficacy. Results: Before treatment, no significant difference existed in the scores of above assessment indexes of patients between the two groups ($P>0.05$). After treatment, the scores of above assessment indexes of patients in the two groups were significantly improved than those before treatment ($P<0.05$), and which in the treatment group were significantly better than those (except for CDR) in the control group ($P<0.05$). So that the total effective rate in the treatment group was higher than that in the control group ($P<0.05$). Conclusion: BBT decoction could significantly improve the activity of daily living of patients with Alzheimer's disease by elevating the scores of various cognitive and learning and memory functions.

Keywords: BBT Decoction; Alzheimer's Disease; Cognition; Memory; ADL; TCMSS

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1 Introduction

Alzheimer's disease (AD) is a degenerative neurological disorder that primarily affects elderly individuals. Its typical clinical symptoms include progressive cognitive

impairment, with the most common being the loss of memory, especially recent memory loss, which is the initial symptom of AD [1]. The main pathological fea-

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tures of AD include brain atrophy, the formation of senile plaques (SP) composed of amyloid beta ($A\beta$) protein deposits, the aggregation of tau proteins leading to neurofibrillary tangles (NFTs), synaptic loss, and neuronal degeneration and death. $A\beta$ is a common pathway involved in the pathogenesis of various factors [2]. Currently, the pharmacological treatment of AD mainly includes cholinesterase inhibitors, NMDA receptor antagonists, β -secretase 1 inhibitors, etc., but the efficacy is not ideal, and they have certain side effects [3, 4]. Traditional Chinese medicine (TCM) believes that AD belongs to the category of “dementia”, and its pathogenesis is often attributed to kidney *qi* deficiency and phlegm obstruction. The treatment approach often focuses on tonifying the kidneys and replenishing *qi*, as well as resolving phlegm and promoting circulation [5]. Han et al. [6] suggested that kidney deficiency syndrome is the main pattern of elderly dementia, and significant therapeutic effects were observed after treatment with a formula that tonifying kidneys and resolves phlegm. Wang et al. [7] conducted a study that showed that Shenqi Xingnao granules were significantly more effective than the control group in improving patient cognitive function and reducing daily living ability scores. Jin et al. [8] found that the Huoxue Tongqiao formula significantly improved the mental status of patients as assessed by the Mini-Mental State Examination (MMSE) and improved their abilities of daily living (ADL). Banxia Baizhu Tianma (BBT) decoction has the functions of resolving phlegm and extinguishing wind, invigorating the spleen, and eliminating dampness. Modern pharmacological research shows that BBT decoction can inhibit the neurotoxic mechanisms of $A\beta$ and protect nerves [9]. Wang [10] found that BBT decoction had a significant effect on cognitive impairment in patients with Alzheimer's disease. This study aims to observe the effects of BBT decoction on the cognition, learning, memory abilities, and traditional Chinese medicine syndrome scores (TCMSS) of AD patients, and evaluate the clinical efficacy of BBT decoction in the treatment of patients turbid phlegm blocking orifice (TPBO) syndrome of AD.

2 Subjects and Methods

2.1 Subjects

Ninety-six patients diagnosed with AD and admitted to the Neurology Department of Jvnan County Hospital of

Traditional Chinese Medicine from October 2020 to October 2021 were selected. The patients were divided into a control group of 49 individuals and an observation group of 47 individuals using a random number table method. Ethical approval for this study was obtained from the Medical Ethics Committee of Shandong Jvnan County TCM Hospital (No: 20200006), and informed consent was obtained from all participants.

2.2 Diagnostic Criteria

The diagnostic criteria were based on the revised diagnostic criteria of the National Institute on Aging and Alzheimer's Association (NIAAA) [11] and the diagnostic criteria for organic mental disorders in the Chinese Classification and Diagnostic Criteria of Mental Disorders (CCMD-3) [12] revised by the Chinese Society of Psychiatry, Chinese Medical Association. The clinical phenotype included progressive memory decline over more than 6 months reported by the patient or informant. Significant decline in episodic memory ability was detected through a clue recall test, meeting the diagnostic criteria for organic mental disorders. Patients exhibited comprehensive cognitive impairment, without sudden stroke-like episodes. There were no signs of focal neurological deficits in the early stages of the disease, and clinical or special examinations did not suggest that cognitive impairment was due to a systemic cerebral disease.

TCM Syndrome Diagnostic Criteria: The Scale for the Differentiation of Syndrome of Vascular Dementia (SDSVD) was used to assess the TCM syndrome scores (TCMSS). A score of ≥ 7 indicated the presence of the syndrome. Scores of 7-14 indicated mild, 15-22 indicated moderate, and 23-30 indicated severe syndromes [13].

2.3 Inclusion and Exclusion Criteria

2.3.1 Inclusion Criteria

Patients who met the diagnostic criteria for AD and exhibited the syndrome pattern of phlegm obstruction [14] were included.

2.3.2 Exclusion Criteria

- 1) Patients with non-AD dementia;
- 2) Patients with other severe organ diseases that were not suitable for participation in this study;
- 3) Patients who were allergic to the study medication or had other adverse reactions.

- 4) Patients who did not adhere to the medication regimen, had treatment outcomes that could not be evaluated after the completion of treatment, or had inaccurate data that affected the assessment of treatment efficacy.
- 5) Patients who were unable to continue the treatment for other reasons during the observation period and withdrew from the study.

2.4 Intervention

2.4.1 Control Group

Patients were received routine clinical treatment, including cognitive interventions, rehabilitation training, health education, psychological care, and treatment with donepezil hydrochloride (5mg, once daily) for 8 weeks.

2.4.2 Observation Group

In addition to the routine treatment received by the control group, the patients in observation group were administered BBT decoction:

- (1) Source: The formula was sourced from “Yi Xue Xin Wu”.
- (2) Prescription: *Pinellia ternata* 12g, *Gastrodia elata* 12g, *Poria cocos* 15g, *Citrus aurantium* 12g, fried *Atractylodes macrocephala* 12g, *Glycyrrhiza uralensis* 6g, and *Jujube* 3g.
- (3) Dosage and administration: The formula was prepared as granules by Guangdong Yifang Pharmaceutical Co., Ltd. One dose was administered daily, divided into morning and evening doses, taken with warm water 1 hour before meals. The treatment course lasted for 8 weeks.

2.5 Evaluation Indicators

2.5.1 Mini-Mental State Examination (MMSE)

It mainly includes several categories such as orientation, memory, attention and calculation, recall, and language ability. The highest score of MMSE is 30 points, with 27-30 points being normal and < 27 indicating cognitive dysfunction. The criteria for dividing dementia are as follows: ≤17 points for illiteracy, ≤20 points for elementary education, ≤22 points for junior high school education (including vocational school), and ≤23 points for college education (including junior college).

2.5.2 Montreal Cognitive Assessment (MoCA)

An assessment tool for screening mild cognitive impairment (MCI) quickly. The cognitive domains evaluated include attention and concentration, executive function, memory, language, visuospatial skills, abstract thinking, and calculation and orientation. The total score of the scale is 30 points, and a normal test result is ≥26 points.

2.5.3 Clinical Dementia Rating (CDR)

Memory is the main item of this scale, and others are secondary items. If at least three secondary items have the same score as the memory score, the CDR is M; when three or more secondary items have a score higher or lower than the memory score, the CDR is the score of the majority of secondary items; when three secondary items have scores on one side of M and two secondary items have scores on the other side of M, the CDR is M; when M=0.5, if at least three other items have a score of 1 or higher, the CDR is 1; if M=0.5, the CDR cannot be 0, it can only be 0.5 or 1; if M=0, the CDR is 0, unless there is impairment in two or more secondary items (0.5 or higher), in which case the CDR is 0.5.

2.5.4 Global Deterioration Scale (GDS)

This scale is used to comprehensively assess the cognitive function of the elderly and dementia patients, or to assess the natural progression of dementia in clinical trials. The GDS divides cognitive function into 7 stages: Stage 1, No cognitive decline; Stage 2, Very mild cognitive decline; Stage 3, Mild cognitive decline; Stage 4, Moderate cognitive decline; Stage 5, Moderately severe cognitive decline; Stage 6, Severe cognitive decline; Stage 7, Very severe cognitive decline. The content includes memory function, instrumental activities of daily living, personality and emotional changes, activities of daily living, and orientation.

2.5.5 Activity of Daily Living (ADL) Scale

There are a total of 14 items, including the Physical Self-maintenance Scale (PSMS) with 6 items: toileting, eating, dressing, grooming, walking, and bathing; and the Instrumental Activities of Daily Living (IADL) with 8 items: using the telephone, shopping, meal preparation, housekeeping, laundry, using transportation, taking medication, and managing finances.

2.5.6 Cohen-Mansfield Agitation Inventory (CMAI)

It assesses the patient's independent ability, physical development, economic activities, language development, concepts of numbers and time, household activities, occupational activities, self-management, sense of responsibility, socialization, violence and destructive behavior, anti-social behavior, resistant behavior, untrustworthy behavior, withdrawal, stereotyped and eccentric behavior, inappropriate interpersonal attitudes, unacceptable habits, self-harm behavior, tendency towards excessive activity, abnormal behavior, mental disorders, substance abuse, and other items.

2.5.7 Traditional Chinese Medicine Syndrome Scores (TCMSS)

Main symptoms include forgetfulness, mental dullness or muteness, delayed reaction, clumsiness, or bizarre delusions; persistent headache, dusky complexion; each symptom scores 2 points. Secondary symptoms include hemiplegia, facial and ocular deviation, numbness on one side of the body, speech impairment; purplish spots on the tongue, thin or sluggish pulse; each symptom scores 1 point. The cumulative sum is the patient's TCMSS, with higher scores indicating more severe symptoms and vice versa.

2.5.8 Clinical Efficacy Evaluation

Primary efficacy index = (Brief Psychiatric Rating Scale score after treatment - Brief Psychiatric Rating Scale score before treatment) / pre-treatment score $\times$ 100%. Significant improvement in mental function, efficacy index $\geq 20\%$ indicates significant efficacy; some im-

provement in mental function, efficacy index 12%-20% indicates effectiveness; if there is no significant improvement compared to before treatment, efficacy index $< 12\%$, or the condition worsens, it is considered ineffective. Overall effective rate = (number of significant efficacy + effective cases) / total number of cases $\times 100\%$ [15].

2.6 Statistical Methods

Statistical analysis was performed using SPSS 23.0 software. Quantitative data were compared using *t*-tests, while categorical data were analyzed using chi-square tests. All results were considered statistically significant at $P < 0.05$.

3 Results

A total of 49 subjects were included in the control group and 47 subjects in the observed group, but 16 subjects dropped out in the control group and 17 subjects dropped out in the observed group. In the control group, there were 33 patients, with mild TCM syndrome in 21, moderate in 9, and severe in 3; in the observation group, there were 30 patients, with mild TCM syndrome in 20, moderate in 6, and severe in 4. There was no significant difference in the severity of the condition between the two groups ($P > 0.05$).

3.1 MMSE Scores

Before treatment, there was no significant difference in MMSE scores between the two groups. After treatment, the MMSE scores of both groups improved significantly compared to before treatment, and the MMSE score of the observed group were significantly higher than those of the control group (Table 1).

Table 1 Comparison of MMSE Scores of patients between the two groups (mean $\pm$ SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	17.55 $\pm$ 4.40	20.58 $\pm$ 4.13	2.88	0.005
Observed group (n=30)	17.60 $\pm$ 3.64	25.27 $\pm$ 4.56	7.21	< 0.001
<i>t</i>	0.05	4.29		
<i>P</i>	0.96	< 0.01		

3.2 MoCA Scores

Before treatment, there was no significant difference in MoCA scores of patients between the two groups; after treatment, MoCA scores increased significantly compared to before treatment in both groups, and MoCA scores of observed group were significantly higher than those of the control group (Table 2).

Table 2 Comparison of MoCA Scores of patients between the two groups (mean±SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	24.06±4.83	26.09±4.31	1.80	0.076
Observed group (n=30)	24.70±5.52	28.97±5.44	3.01	0.004
<i>t</i>	0.49	2.34		
<i>P</i>	0.626	0.023		

3.3 CDR Scores

Before treatment, there was no significant difference in CDR scores of patients between the two groups; after treatment, CDR scores decreased significantly compared to before treatment in both groups. However, there was no significant difference in CMAI scores between the observed group and the control group (Table 3).

Table 3 Comparison of CDR Scores of patients between the two groups (mean±SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	1.58±0.70	0.82±0.53	4.98	<0.001
Observed group (n=30)	1.33±0.63	0.60±0.52	4.92	<0.001
<i>t</i>	1.44	1.66		
<i>P</i>	0.155	0.103		

3.4 GDS Scores

Before treatment, there was no significant difference in GDS scores of patients between the two groups; after treatment, GDS scores decreased significantly compared to before treatment in both groups, and GDS scores in the observed group were significantly lower than those in the control group (Table 4).

Table 4 Comparison of GDS Scale Scores between the two groups of patients (mean±SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	3.76±1.28	3.36±1.37	1.21	0.230
Observed group (n=30)	3.80±1.30	2.63±1.19	3.63	0.001
<i>t</i>	0.13	2.25		
<i>P</i>	0.896	0.028		

3.5 ADL Scores

Before treatment, there was no significant difference in ADL scores of patients between the two groups; after treatment, ADL scores increased significantly compared to before treatment in both groups, and which in the observed group were significantly higher than those in the control group (Table 5).

Table 5 Comparison of ADL Scores of patients between the two groups (mean±SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	48.12±10.76	62.94±9.07	6.05	<0.001
Observed group (n=30)	51.17±10.36	74.30±7.10	10.09	<0.001
<i>t</i>	1.14	5.50		
<i>P</i>	0.258	<0.001		

3.6 CMAI Scores

Before treatment, there was no significant difference in CMAI scores of patients between the two groups; after treatment, CMAI scores decreased significantly compared to before treatment in both groups, and which in the observed group were significantly lower than those in the control group (Table 6).

Table 6 Comparison of CMAI Scores of patients between the two groups (mean $\pm$ SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	45.03 $\pm$ 7.88	37.73 $\pm$ 8.09	3.72	<0.001
Observed group (n=30)	42.60 $\pm$ 7.34	31.53 $\pm$ 7.08	5.94	<0.001
<i>t</i>	1.26	3.22		
<i>P</i>	0.211	0.002		

3.7 TCMSS Scores

Before treatment, there was no significant difference in TCMS scores of patients between the two groups; after treatment, TCMS scores decreased significantly compared to before treatment in both groups, and which in the observed group were significantly lower than those the control group (Table 7).

Table 7 Comparison of TCMSS Scores between the two groups of patients (mean $\pm$ SD)

Groups	Before treatment	After treatment	<i>t</i>	<i>P</i>
Control group (n=33)	12.70 $\pm$ 4.98	10.21 $\pm$ 5.36	1.95	0.055
Observed group (n=30)	13.93 $\pm$ 6.52	7.60 $\pm$ 4.61	2.61	0.012
<i>t</i>	0.85	2.06		
<i>P</i>	0.399	0.043		

3.8 Clinical Efficacy

After treatment, in the control group, there were 10 cases of significant effective, 11 cases of effective, and 12 cases of ineffective; in the observed group, there were 19 cases of significant effective, 6 cases of effective, and 5 cases of ineffective. The total effective rate in the observed group was significantly higher than that in the control group ($\chi^2=7.02$, $P=0.030$). See Table 8.

Table 8 Comparison of clinical efficacy of patients between the two groups

Groups	Total of cases	Effective (case)	Obvious effective (case)	Ineffective (case)	Total effective rate (%)	χ^2 , <i>P</i>
Control group	33	10	11	12	63.64	7.02
Observed group	30	19	6	5	83.33	<0.030

4 Discussion

The main mechanism of Alzheimer's disease is the deposition of amyloid plaques formed by the misfolding of A β in the brain. In addition, the aggregation of Tau protein caused by misfolding is also one of the main pathological mechanisms of AD. Moreover, metabolic disorders of NGF and BDNF, oxidative damage, and other factors are also closely related to the occurrence of A [16-18].

Alzheimer's disease (AD) falls in the category of dementia in TCM. The pathogenesis is due to kidney *qi* deficiency and obstruction of orifices by phlegm. The treatment principle is to tonify the kidney and invigorate *qi*, as well as resolve phlegm and clear orifices [5]. Shu et al. [19] used a formula to eliminate stasis and promote blood circulation for treatment, and the results showed a signifi-

cant improvement in MMSE scale scores and a significant decrease in ADL scale scores for AD patients. Wei et al. [20] treated 53 AD patients with butylphthalide combined with acupuncture, and the results showed significant improvements in the patients' nerve scores and cognitive abilities, with no toxic side effects.

BBT decoction is a TCM formula for resolving phlegm. The combination of *Pinellia ternata* and *Gastrodia elata* in the formula has the effect of resolving phlegm and calming wind. It is an essential medicine for treating wind-phlegm dizziness and headache. *Pinellia ternata*, with its warm and pungent nature, can dry dampness and resolve phlegm, as well as descending rebellious *qi* and stopping vomiting. *Gastrodia elata*, with its sweet and neutral nature, enters the *Jueyin* meridian and is effective in calming liver wind and alleviating dizziness. *Atractylodes macrocephala*, as an assistant herb, has the function of strengthening spleen and drying

dampness, which is the fundamental approach to treating excessive phlegm. When combined with *Pinellia ternata* and *Gastrodia elata*, it can help to resolve dampness and phlegm. *Poria cocos* and *Citrus aurantium* are used as adjuvant herbs in the formula. *Poria cocos* has a sweet and bland nature, which can strengthen the spleen and promote diuresis to resolve dampness. *Citrus aurantium* has a pungent and bitter nature, which can assist in regulating *qi* and transforming phlegm, making the phlegm disappear when the *qi* flows smoothly. The combination of *Pinellia ternata*, *Atractylodes macrocephala*, and *Citrus aurantium* in the formula can effectively resolve phlegm, strengthen spleen, and promote *qi* circulation. Li Mo [21] found that the combination of BBT decoction and donepezil hydrochloride had a good therapeutic effect on AD, which could improve the patient's quality of life, improve their mental behavior, reduce the risk of complications, and have low adverse reactions. Li et al. [22] found that BBT decoction was helpful in improving the cognitive level of AD patients. Yoshiharu [8] found that after 4 weeks of BBT decoction treatment, the patients' Hasegawa dementia scale scores improved significantly. In this study, the clinical scores of the observed group were significantly improved, and the therapeutic effect was more significant than that of the control group, especially for patients with moderate to severe AD, indicating that BBT decoction can significantly improve the mental state of patients, thus markedly improving their quality of life with a remarkable clinical effect.

The basic pathological mechanisms of AD mainly include A β deposition, neurofibrillary tangle formation, which are associated with oxidative damage and chronic inflammation. Common therapeutic strategies involve antioxidative damage and acetylcholinesterase (AChE) inhibition [23]. Modern pharmacological research indicates that BBT decoction can exert neuroprotective effects by exerting anti-inflammatory, antioxidative, and A β neurotoxicity inhibitory mechanisms [24]. Studies have shown that *Pinellia ternata*, the main component of the BBT decoction, contains alkaloids, cerebrosides, flavonoids, steroids, amino acids, *Pinellia* starch, and various trace elements, significantly improving learning and memory abilities in dementia animal models [25]. The total alkaloids of *Pinellia ternata* can scavenge free radicals in the body, thus, the antioxidative mechanism of total alkaloids may be one of the mechanisms for the treatment of AD in this prescription [26].

The main components of *Gastrodia elata* include phenols, organic acids, polysaccharides, and steroids [27]. Modern pharmacological studies have found that gastrodin in *Gastrodia elata* can inhibit the secretion of inflammatory factors by inhibiting microglial cells, thus inhibiting progress of AD [28]. The main chemical components of *Atractylodes macrocephala* include lactones, glycosides, volatile oils, polysaccharides, amino acids, vitamins, and resins [29], which can improve cognitive abilities and enhance learning and memory by reducing AChE activity and increasing ACh expression [30]. The main chemical components of *Poria cocos* include triterpenes and polysaccharides, which have antioxidative and anti-aging effects, thus improving the memory of AD patients [31]. The main chemical components of *Citrus aurantium* include flavonoids, polysaccharides, naringin, apigenin, and volatile oils, which have good antioxidative effects [32]. The components of *Pinellia ternata*, *Poria cocos*, and *Citrus aurantium* in this prescription all have good antioxidative effects, combined with the AChE inhibitory function of *Gastrodia elata*, which can produce therapeutic effects on AD from multiple directions.

5 Conclusion

The study demonstrates that Banxia Baizhu Tianma (BBT) decoction significantly improves cognitive function, learning, memory abilities, and Traditional Chinese Medicine Syndrome Scores (TCMSS) in Alzheimer's disease (AD) patients, particularly those with moderate to severe AD. The treatment was more effective than the control group, enhancing patients' quality of life with notable clinical benefits.

Ethics Approval and Consent to Participate

All related experiments were approved by the Ethics Committee of Shandong Jynan County TCM Hospital (No: 20200006).

Conflicts of Interest

The authors declare that there are no conflict of interest.

References

- [1] Reitz C, Mayeux R. Alzheimer disease: epidemiology, diagnostic criteria, risk factors and biomarkers. *Biochem Pharmacol*, 2014, 88(4): 640-651.
- [2] Du H, Yuan XD. Progress in the etiology and pathogenesis of Alzheimer's disease. *J Shandong Univer (Health Sciences)*, 2017, 55(10): 21-27.
- [3] Fan HS, Su YN, Ma L. Effect of combination of remynil and menantine hydrochloride on patients with Alzheimer's disease. *Chin J Pract Med*, 2019, 46(1): 105-108.
- [4] Liu XH. Clinical efficacy and adverse reactions of memantine hydrochloride on patients with senile Parkinson's disease dementia. *Chronic Pathematol J*, 2019, 20(1): 36-38.
- [5] Du CX, Yang F, Yang CZ. Research on the medication regularity of tonifying the kidney, resolving phlegm, removing blood stasis compound in the treatment of Alzheimer's disease. *Modern Chin Med*, 2017, 37(4): 85-88.
- [6] Han WW, Zhang YL, Li Q, et al. Clinical efficacy of Yishen Huazhuo Method in the treatment of mild Alzheimer's disease with traditional Chinese medicine syndrome differentiation. *Chin J Gerontol*, 2017, 37(10): 2412-2415.
- [7] Wang YJ, Yang J, Zhang J, et al. Clinical research of treating Alzheimer disease with shenqi xingnao granule. *Clin J Tradit Chin Med*, 2017, 25(9): 699-702.
- [8] Jin X, Duan QY, Zhang DX, et al. Observation on the therapeutic effect of Huoxue Tongqiao formula in the treatment of Alzheimer's disease. *Chin J Integr Med on Cardio-Cerebrovas Dis*, 2017, 15(16): 2057-2059.
- [9] Nakae Y, Kumagai Y, Kosuge T. The effectiveness of Hangebyakujutsutemmato for Alzheimer's type dementia. *Kampo Medicine*, 2013, 64(2): 104-107.
- [10] Wang SL. Treatment of 69 cases of senile dementia with the combination of Banxia Baizhu Tianma decoction and Chuanxiong Chatiao decoction. *World Chin Med*, 2011, 6(6): 491.
- [11] The Chinese Society of Psychiatry. Chinese Classification and Diagnostic Criteria of Mental Disorders (CCMD-3). Shandong Science and Technology Press, 2001.
- [12] Zhao JZ, Wang T, Zuo XC, et al. New edition diagnosis standard of Alzheimer's of USA and drug clinical trials. *Chin J Clin Pharmacol*, 2012, 28(7): 554-556.
- [13] Wang W, Yu WT, Nie JT, et al. Characteristics of TCM syndromes in patients with vascular dementia. *Chin J Forensic Med*, 2017, 23(4): 514-517.
- [14] Wang F, Yang N, He YF, et al. Cognitive dysfunction associated with cerebral small vessel disease in Chinese medicine. *Modern J Integr Tradit Chin West Med*, 2021, 30(14): 1507-1510.
- [15] Wang HH, Xiao SF, Li X, et al. Validation of clinical global impression for efficacy evaluation in patients with Alzheimer's disease. *Shanghai Archives of Psychiatry*, 2009, 21(5): 269-272.
- [16] Rowan MJ, Klyubin I, Wang Q, et al. Synaptic memory mechanisms: Alzheimer's disease amyloid beta-peptide-induced dysfunction. *Biocheml Soc Trans*, 2007, 35(5): 1219.
- [17] Smolek T, Jadhav S, Brezovakova V, et al. First-in-rat study of human Alzheimer's disease Tau propagation. *Mol Neurobiol*, 2019, 56(1): 621-631.
- [18] Millon MBB, Iulita MF, Huimaraes MEN, et al. NGF and BDNF dysmetabolism in a transgenic rat model of Alzheimer's disease. *Alzheimers Dementia*, 2017, 13(7): 322-323.
- [19] Shu SY, Yang Q, Zhang HX. The therapeutic effect of nourishing kidney and promoting blood circulation traditional Chinese medicine on Alzheimer's disease and its influence on oxidative stress indicators and β -amyloid levels. *Modern J Integr Tradit Chin West Med*, 2017, 26(21): 2331-2333.
- [20] Wei QX, Zhang XM, Yan XY, et al. Clinical observation of butylphthalide combined with acupuncture in the treatment of Alzheimer's disease. *Modern J Integr Traditl Chin West Med*, 2011, 20(3): 291-292.
- [21] Li M. Effect of Banxia Baizhu Tianma Tang combined with donepezil hydrochloride on TESS scores in patients with Alzheimer disease. *New Chin Med*, 2020, 52(16): 34-37.
- [22] Li GY, Tang GX, Li YH. Banxia Baizhu Tianma decoction in the treatment of Alzheimer's disease. *J Clin Exp Med*, 2006, 5(5): 602-602.
- [23] Breijyeh Z, Karaman R. Comprehensive review on Alzheimer's disease: Causes and treatment. *Molecules*, 2020, 8, 25(24): 5789.
- [24] Xiong XJ, Wang J Application of Banxia Baizhu Tianma decoction in the treatment of hypertension. *Chin J Tradit Chin Med*, 2012, 27(11): 2862-2865.
- [25] eng CX, Yu ZM, Lin PZ, et al. Effect of *Pinellia* total alkaloids on motor coordination, locomotion, and spatial working memory on healthy mice. *J Hunan Univer Chin Med*, 2021, 41(11): 1676-1682.
- [26] Amadoro G. Role of oxygen radicals in Alzheimer's disease: focus on Tau protein. *Oxygen*, 2021, 1(2): 96-120.
- [27] Liu HJ, Bai M, Miao MS. Application and analysis of Chinese patent medicine containing *Gastrodia elata* Blume. *Acta Neuropharmacologica*, 2019, 9(6): 26-30.

- [28] Xi Z, Qiao Y, Wang J, et al. Gastrodin relieves inflammation injury induced by lipopolysaccharides in MRC-5 cells by up-regulation of miR-103. *J Cell Mol Med*, 2020, 24(2): 1451-1459.
- [29] Zhao YJ, Gao Y, Zhou YZ, et al. Research progress on pharmacological effect and mechanism of *Atractylodes macrocephala* in nervous-mental system diseases. *Chin Tradit Herb Drug*, 2017, 48(21): 4546-4551.
- [30] Song X, Wang T, Guo L, et al. In vitro and in vivo anti-AChE and antioxidative effects of *Schisandra chinensis* extract: A potential candidate for Alzheimer's disease. *Evidence-based Complementary and Alternative Medicine*, 2020, 2020(11): 1-10.
- [31] Deng TM, Peng DY, Yu NJ, et al. Research progress on chemical composition and pharmacological effects of *Poria cocos* and predictive analysis on quality markers. *Chin Tradit Herb Drug*, 2020, 51(10): 2703-2717.
- [32] Yao LH. Study on antioxidant capacity and anti fatigue effect of *exocarpium citri grandis* polysaccharides. *Cerealis Oils*, 2019, 32(4): 95-100.