Research Article

The Effect of the Integrated Chinese and Western Medicine for the Treatment of Parkinson’s Disease: A Meta-Analysis

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Received 8 February 2022; Revised 1 March 2022; Accepted 14 March 2022; Published 8 April 2022

Objective. Traditional Chinese medicine (TCM) has been used to treat Parkinson’s disease (PD), but the efficacy is still not clear. The aim of this study was to evaluate the effect of the integrated Chinese and Western medicine (ICWM) for PD through a meta-analysis.

Methods. We searched randomized controlled trials comparing integrated Chinese and Western medicine (ICWM) versus conventional Western medicine (CWM) for Parkinson’s disease. Data were extracted from eligible studies. We sought to evaluate pretreatment and posttreatment symptoms of PD patients and their quality of life and reduce adverse reactions. The results were expressed as risk ratio (RR) and mean difference (MD) with accompanying 95% confidence intervals.

Results. Twenty-three studies were included in this study with a total of 1769 patients. The pooled results revealed that ICWM significantly improved the UPDRS score than CWM, the MD of UPDRS-I, II, III, and IV was -1.05 (95% CI: -1.42 to -0.69, \( P < 0.00001 \)), -2.55 (95% CI: -3.19 to -1.90, \( P < 0.00001 \)), -3.64 (95% CI: -4.69 to -2.60, \( P < 0.00001 \)), and -0.61 (95% CI: -0.96 to -0.27, \( P = 0.0004 \)), respectively, and ICWM also had a better score of PDQ-39 (MD = -8.71, 95% CI: -13.52 to -3.90, \( P = 0.0004 \)) and MoCA scores (MD = 3.35, 95% CI: 1.65 to 5.04, \( P = 0.0001 \)) compared with CWM. ICWM had certain advantages in terms of effective rate (RR = 1.27, 95% CI: 1.18 to 1.37, \( P < 0.00001 \)) and adverse reactions (RR = 0.21, 95% CI: 0.13 to 0.36, \( P < 0.00001 \)). Conclusion. Our research supported that ICWM had important health benefits for patients with PD and can effectively improve the symptoms of PD patients and their quality of life and reduce adverse reactions. Due to the lower quality of the included studies, large sample and multicenter randomized control test should be performed to verify our conclusions.

1. Introduction

Parkinson’s disease (PD) is a central nervous system disease characterized by motor as the main manifestation (1). With the in-depth study of the disease, in addition to motor dysfunction, its nonmotor symptoms have also attracted attention, such as sleep disorder, anxiety and depression, cognitive dysfunction, and restless leg syndrome (2, 3). The incidence rate of common population in developed countries is about 0.3%, and the rate of people over 60 is about 1%, while it is up to 3% over 80 (4).

The treatment of PD takes compound levodopa, dopamine receptor agonist, and monoamine oxidase inhibitor as the main intervention measures (5, 6). These drugs not only alleviate the movement disorder but also play a good regulatory role in sleep. However, due to long-term use, they have side effects such as efficacy attenuation, switching phenomenon, and dyskinesia (7).

Traditional Chinese medicine (TCM) believes that PD belongs to "vibration disease," and those with muscle tension, spasm, and slowness of movement can be diagnosed as TCM detention disease; those with both obvious symp-
toms can be diagnosed as “shaking detention disease” in TCM (8). TCM uses the combination of disease and syndrome, syndrome differentiation, treatment according to syndrome, and other methods to treat PD and has achieved good clinical effects in terms of increasing efficiency and reducing toxicity and improving the patients’ quality of life (9). TCM is a holistic medical system, which includes herbal medicine, acupuncture, tai chi, massage, diet therapy, and qigong. Many studies have found that the combination of traditional Chinese medicine and Western medicine has both synergistic efficacy and the advantages of reducing the adverse reactions of Western medicine (10, 11).

So far, a large number of studies have been carried out to study the role of the integrated Chinese and Western medicine (ICWM) in the treatment of PD (12, 13). In view of the lack of relevant systematic evaluation, this study was aimed at comprehensively collecting the published randomized controlled trials (RCTs) of the ICWM for the treatment of PD and systematically evaluating the stability and safety of its efficacy by comparing the clinical efficacy of the ICWM and conventional Western medicine (CWM) in the treatment of PD, so as to provide basis for rational and safe drug use.

2. Methods

2.1. Literature Search Strategy. Two authors (Z Wang and T Wang) performed a systematic search in 6 electronic databases including Cochrane Central Register (CENTRAL), PubMed, China National Knowledge Internet (CNKI) Database, Chinese Biological Medical (CBM) Database, Wanfang Database, and China Science and Technology Journal Database (VIP) (up to December 31, 2021) with the following keywords: (1) traditional Chinese medicine; (2) Chinese medicine; (3) Parkinson’s disease; and (4) Parkinsonism. The search strategy was refined by combining the keywords using the Boolean operators “OR” or “AND.” There were no restrictions on the publication language in the literature search. Disagreements were resolved through consensus between the reviewers.

2.2. Study Selection. Inclusion criteria included the following: (1) researches comparing patients who receive integrated Chinese and Western medicine (ICWM) with conventional Western medicine (CWM); (2) patients with Parkinson’s disease; (3) containing indicators evaluating effectiveness between the two therapy; and (4) available in full text. The exclusion criteria were as follows: (1) ineligible article design; (2) duplicate articles; (3) reviews, protocols, or letters; and (4) no sufficient related outcomes.

2.3. Data Extraction and Quality Assessment. Two independent reviewers (B Sheng and W Song) performed the study selection, quality assessment, and data extraction. All available information related to our study topic was extracted from the included studies, including study authors, study design, treatment therapy, patients’ characteristics (age and gender), year of outset, and time of follow-up.

We assessed the methodological quality of the included studies by the Cochrane Collaboration tool, which was based on the following six items: allocation concealment, random sequence generation, blinding (objective outcomes), blinding (self-reported), selective and incomplete outcome reporting, and other bias presence.
| Study                          | Study design | Intervention                        | Treatment          | No. of patients | Gender (M/F) | Age Follow-up | Intervention | Control | Intervention | Control | Duration          |
|-------------------------------|--------------|-------------------------------------|--------------------|-----------------|--------------|---------------|--------------|----------|--------------|----------|------------------|
| Li Chengdong 2011 RCT         | Herbal fumigation and washing prescription + medoba | Medoba              | 40                | 40              | 23/17        | 61 ± 11.83    | 61 ± 11.83   | 4 months | 2006 to 2010  |
| Wan Fung Kum 2011 RCT         | Jia Wei Liu Jun Zi Tang + CMW | CMW                 | 22                | 25              | 14/8         | 64.82 ± 8.88  | 60.88 ± 9.41 | 24 weeks | NR           |
| Weidong Pan 2011 RCT          | Zeng-xiao An-shen Zhi-chan 2 + CMW | CMW                 | 56                | 54              | 34/22        | 62.82 ± 10.31 | 63.1 ± 10.2  | 13 weeks | 2008 to 2010  |
| Yang Qingtang 2012 RCT        | Shaoyao Gancao decoction + Ganmai Dazao decoction + medoba | Medoba              | 34                | 34              | NR           | NR            | NR           | 12 weeks | 2009 to 2011  |
| Yu Dengjun 2012 RCT           | Ginseng Guipi decoction + medoba | Medoba              | 50                | 48              | NR           | 70.02 ± 6.73  | 70.02 ± 6.73 | 4 weeks  | 2009 to 2011  |
| Zhong Cheng 2012 RCT          | Bushen Huoxue Tongluo capsule + CMW | CMW                 | 60                | 60              | NR           | 51.82         | 51.82        | 3 months | 2011 to 2012  |
| Chen Mengyun 2014 RCT         | Zhizhan granule + CMW | CMW                 | 57                | 51              | 38/19        | 66.44 ± 7.64  | 65.63 ± 7.37 | 12 weeks | 2012 to 2013  |
| Chao Gu 2015 RCT              | Di-Huang-Yi-Zhi + donepezil | Donepezil           | 30                | 30              | 14/16        | 67.33 ± 9.31  | 67.06 ± 9.63 | 6 months | 2010 to 2013  |
| Wen Lili 2015 RCT             | Cistanche wuxifeng granule + medoba | Medoba              | 29                | 28              | 15/14        | 70.79 ± 7.50  | 71.21 ± 5.95 | 3 months | 2013 to 2014  |
| You Jiahua 2015 RCT           | Shuijing dingzhan decoction + CMW | CMW                 | 30                | 30              | 22/8         | 65.4 ± 7.9    | 65.1 ± 8.2   | 12 weeks | 2013 to 2014  |
| Bai Yu 2016 RCT               | Zishen Roujing decoction + CMW | CMW                 | 54                | 54              | 33/21        | 66.81 ± 7.86  | 66.16 ± 7.72 | 12 weeks | 2007 to 2015  |
| Xu Qingshui 2016 RCT          | Cistanche Rongjing + levodopa | Levodopa            | 14                | 10              | 8/6          | 60.35 ± 8.17  | 63.22 ± 6.79 | 3 months | NR           |
| Ye Qing 2016 RCT              | Yizhi Pingzhan recipe + levodopa | Levodopa            | 40                | 38              | 25/15        | 67.59 ± 7.89  | 65.93 ± 6.63 | 3 months | 2013 to 2015  |
| Zhang Lijuan 2016 RCT         | Qingxin Kaiqiao recipe + acupuncture + medoba | Medoba              | 49                | 49              | NR           | 62.3 ± 11.2   | 63.1 ± 10.5  | 4 months | 2015         |
| Cai Li 2017 RCT               | Zhizhan decoction + CMW | CMW                 | 43                | 43              | 25/18        | 57.24 ± 3.36  | 58.14 ± 4.12 | 12 weeks | 2014 to 2016  |
| Chen Yu 2017 RCT              | Tianma goutengyin and Shaoyao Gancao decoction + medoba | Medoba              | 36                | 36              | 22/14        | 68.8 ± 10.5   | 67.7 ± 9.9   | 3 months | 2013 to 2015  |
| Wang Jiecheng 2017 RCT        | Self-made prescription + dopashydrazine | Dopashydrazine      | 49                | 49              | 28/21        | 72.32 ± 10.72 | 73.81 ± 10.64 | 4 weeks  | 2016         |
| Mo Haizhen 2018 RCT           | Yishen tiaogan lieyu recipe + dopashydrazine | Dopashydrazine      | 30                | 30              | 13/17        | 62.74 ± 4.89  | 64.57 ± 6.68 | 8 weeks  | 2016 to 2017  |
| Study       | Study design | Treatment  | No. of patients | Gender (M/F) | Age Follow-up | Duration |
|-------------|--------------|------------|-----------------|--------------|---------------|----------|
| Xu Xiao 2018| RCT          | Shaoyao Gancao decoction+CMW | CMW            | 30           | 16/14         | 53 ± 11.45 | 3 months |
|             |              |            |                 |              |               |          | 2014 to 2017 |
| Cao Jianfeng| RCT          | Dialectical prescription+levodopa | Levodopa      | 45           | 29/16         | 68.56 ± 2.71 | 8 weeks |
| 2020        |              |            |                 |              |               |          | 2016 to 2018 |
| Liao Xun 2020| RCT         | Dialectical prescription+dopashydrazine | Dopashydrazine | 36           | 20/16         | 52.47 ± 1.36 | 11 weeks |
|             |              |            |                 |              |               |          | 2018 to 2019 |
| Zhao Lili 2020| RCT        | Dialectical prescription+medoba | Medoba        | 60           | NR            | 57.00 ± 13.87 | 5 weeks |
|             |              |            |                 |              |               |          | 2017 to 2019 |
| Zhang Quan 2021| RCT      | Yangxue Pinggan granule+CMW | CMW           | 20           | 10/10         | 58.00 ± 14.05 | 8 weeks |
|             |              |            |                 |              |               |          | 2017 to 2019 |

RCT: randomized controlled trial; CMW: conventional Western medicine; NR: not reported.
2.4. Statistical Analysis. All statistical analyses were performed by using Review Manager (version 5.4) software (RevMan; The Nordic Cochrane Centre, Copenhagen, Denmark, 2020). Continuous variables were expressed as mean difference (MD) with 95% confidence interval (CI), and risk ratio (RR) was used for classification data. Heterogeneity of the data was assessed using the chi test and $I^2$ values. $I^2$ of 25, 50 and 75% will be considered to represent low, medium, and high heterogeneity, respectively. A fixed effect model was applied in the absence of heterogeneity, while random effect model was used if heterogeneity was observed. Publication bias was evaluated by visual inspection of funnel plots and using Egger’s tests.

3. Results

3.1. Search Process. A total of 326 eligible studies were screened. After exclusion of 303 trials that did not meet our inclusion criteria, 23 randomized RCTs with a total of 1769 patients were included (14–36). The process of literature retrieval is shown in Figure 1.

3.2. Characteristics of the Included Studies. Table 1 showed the main characteristics of the included studies. The ICWM group treatment contained herbal prescription, decoction, capsule, and granule, and the CWM group was treated with medoba, donepezil, levodopa, or dopashydrazine. All these studies were published from 2011 to 2021. The sample size ranged from 24 to 120.

3.3. Results of the Quality Assessment. The quality of the included studies were assessed in accordance with Cochrane Collaboration tool. There were no high risk of six kinds of bias in each studies (Figure 2). A summary of the risk of bias assessment for all included studies is shown in Figure 3.

3.4. Results of the Heterogeneity Test

3.4.1. UPDRS Score. The Parkinson’s disease rating scale (UPDRS) scored the patient’s condition before and after treatment and evaluated the scores of four parts of UPDRS: I, II, III, and IV. Part I mainly evaluated the patient’s mental behavior and emotional factors, part II evaluated the patient’s ability of daily living, part III evaluated the patient’s motor ability, and part IV evaluated the complications during treatment. Ten, eleven, twelve, and eight trials compared the effect of the ICWM versus CWM according to changes in the UPDRS-I, II, III, and IV score, respectively.

The pooled results from the random effect model showed that the ICWM group had a higher decrease of UPDRS-I, II, III, and IV than the CWM group, as the MD of UPDRS-I, II, III, and IV were $-1.05$ (95% CI: $-1.42$ to $-0.69$, $P < 0.00001$), $-2.55$ (95% CI: $-3.19$ to $-1.90$, $P < 0.00001$), $-3.64$ (95% CI: $-4.69$ to $-2.60$, $P < 0.00001$), and $-0.61$ (95% CI: $-0.96$ to $-0.27$, $P = 0.00004$), respectively (Figure 4). The results demonstrated that ICWM showed a significant beneficial effect in improving mental behavior, emotional factors, ability of daily living, motor ability, and complications than CWM.
Random sequence generation (Selection bias)
Allocation concealment (Selection bias)
Blinding of participants and personnel (Performance bias)
Blinding of outcome assessment (Detection bias)
Incomplete outcome data (Attrition bias)
Selective reporting (Reporting bias)
Other bias

0% 25% 50% 75% 100%
Low risk of bias
Unclear risk of bias
High risk of bias

Figure 3: Quality assessment of the included studies: low risk (green), unclear (yellow), and high risk (red).

| Study or Subgroup | Intervention Mean | Control Mean | Mean difference | IV, Random, 95% CI | Mean difference IV, Random, 95% CI |
|-------------------|------------------|--------------|----------------|------------------|------------------|
| ICWM              |                  |              |                |                  |                  |
| Chen meng 2014    | -0.52 ± 0.69     | 0.02 ± 0.70  | -0.54 ± 0.70   |                  |                  |
| Mo han 2014       | -0.50 ± 0.68     | 0.06 ± 0.59  | -0.56 ± 0.62   |                  |                  |
| Wang 2014         | -0.49 ± 0.58     | 0.08 ± 0.61  | -0.57 ± 0.65   |                  |                  |
| Li 2015           | -0.48 ± 0.62     | 0.05 ± 0.62  | -0.53 ± 0.68   |                  |                  |
| Wu 2016           | -0.47 ± 0.63     | 0.04 ± 0.61  | -0.51 ± 0.66   |                  |                  |
| Zhang 2017        | -0.46 ± 0.62     | 0.04 ± 0.61  | -0.50 ± 0.65   |                  |                  |
| Other bias        |                  |              |                |                  |                  |

Figure 4: Forest plot showing the mean difference in the UPDRS score between ICWM and CWM groups.
the Montreal Cognitive Assessment (MoCA). The MoCA
calculated 236 patients reported it by the instruments of
3.4.3. Cognitive Function. For cognitive function, three stud-
3.4.2. PDQ-39 Score. Six studies involving 430 patients con-
tributed to the analysis of life quality, by using the question-
naires of the 39-item Parkinson’s disease questionnaire
(PDQ-39). The pooled analysis indicated that, compared
with CWM group, the ICWM group resulted in a great
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3.4.5. Adverse Reaction. A total of eight studies reported the adverse reaction. The forest plot showed that the rate of adverse reactions in the ICWM group was lower than the CWM group (RR = 0.21, 95% CI: 0.13 to 0.36, P < 0.00001) (Figure 8), without significant heterogeneity among studies ($I^2 = 0\%$, $P = 0.81$) (Figure 8).
3.5. Publication Bias. Funnel plots were performed to evaluate the publication bias. Two funnel plots were produced for indexes of effective rate and adverse reaction, and they showed some evidence of asymmetry (Figure 9), but the Egger’s linear regression for quantitative publication bias of two indexes was nonsignificant (effective rate, $P = 0.478$; adverse reaction, $P = 0.751$), which suggested that no significant publication bias existed in our meta-analysis.

4. Discussion

With the increasing global aging society, the prevalence and incidence of PD continue to increase. Studies have confirmed that almost all PD patients have at least one nonmotor symptom, which is closely related to the duration of PD, disease severity, and cognitive function (37). Damage is closely related, which is also the main factor affecting the quality of life of patients and even late disability. In terms of Western medicine treatment, levodopa is still the only reported drug that can prolong life expectancy, but after long-term replacement therapy treatment, it will become less and less advantageous, and more than 50% of PD patients will eventually experience severe movement disorders, sleep attacks, and adverse reactions, resulting in an immeasurable burden on patients, families, and society (38, 39). Traditional Chinese medicine is effective in alleviating various symptoms, especially age-related symptoms.

Compared with the traditional CWM, ICWM treatment can prolong the increase of CWM dosage and the time course of combined medication. At the same time, traditional Chinese medicine has less toxic and side effects (40). Therefore, taking advantage of the traditional Chinese medicine can not only improve the clinical symptom severity score of PD but also have fewer adverse reactions (41, 42).

The results of this study showed that the treatment of PD with ICWM was better than the simple CWM treatment in reducing the UPDRS score and improving the PDQ-39 (MD = −8.71, 95% CI: -13.52 to -3.90, $P = 0.0004$), and it was also better than CWM in the MoCA scores (MD = 3.35, 95% CI: 1.65 to 5.04, $P = 0.0001$). There are certain advantages in terms of effective rate (RR = 1.27, 95% CI: 1.18 to 1.37, $P < 0.00001$) and adverse reactions (RR = 0.21, 95% CI: 0.13 to 0.36, $P < 0.00001$). This is consistent with Tian’s research results (43).

This meta-analysis has the following limitations. First, most of the included studies were in Chinese, with only 3 articles in English, and the research subjects were all domestic patients. There may be bias in population selection and low research quality. Second, only 6 of the included studies used a random number table, and the rest of the studies mentioned “random” but did not specify the random method. Third, except for 3 studies that adopted double-blind method, the rest did not mention the specific blinding method. Fourth, sleep disorders in PD require long-term treatment, and the included studies lack long-term follow-up.

To sum up, ICWM can effectively improve the symptoms of PD patients and their quality of life and reduce adverse reactions. It is a safe and effective intervention method in clinical practice. Due to the limitations of the quality and quantity of the included studies, this systematic review still has many deficiencies. More randomized controlled trials should be implemented to further strengthen this evidence.

Data Availability

No data were used to support this study.

Ethical Approval

The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are appropriately investigated and resolved.

Disclosure

All authors have completed the ICMJE uniform disclosure form.

Conflicts of Interest

The authors have no conflicts of interest to declare.

Authors’ Contributions

Zengmian Wang and Tianshu Wang have contributed equally to this work and share first authorship.

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