Effect of Yiqi Yangyin prescription in treatment of dilated cardiomyopathy: a Meta-analysis of randomized controlled trials

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Abstract

OBJECTIVE: To evaluate the therapeutic effect of Yiqi Yangyin prescription for dilated cardiomyopathy (DCM).

METHODS: Electronic databases were searched for relevant clinical randomized controlled trials of DCM treatment using Yiqi Yangyin prescription (Shengmai and Zhigancao decoction). Databases searched included PubMed, EMBASE, the Cochrane Library, China National Knowledge Infrastructure Database, Wanfang Database, China Science and Technology Journal Database, and Chinese Biological Medicine from January 1, 1985, to October 31, 2015. After literature screening and data extraction according to previously determined exclusion criteria, data were analyzed using RevMan 5.3 and Stata 12.0. Study heterogeneity was evaluated using the I² test and Cochran’s Q test. Egger’s test was used to detect publication bias.

RESULTS: Nineteen trials involving 1024 participants were included in the Meta-analysis. Of these, 15 used Shengmai (treatment group: 421 cases; control group: 344 cases) and 4 used Zhigancao decoction (treatment group: 133 cases; control group: 126 cases). A Meta-analysis demonstrated that the total curative effect was significantly improved by combining Shengmai with conventional treatment [relative risk (RR) = 1.32, 95% confidence intervals (CI) (1.22, 1.43), P < 0.01]. Left ventricular ejection fraction [standard mean difference (SMD) = 1.13, 95% CI (0.55, 1.70), P < 0.01] and left ventricular end diastolic [SMD = −0.46, 95% CI (−0.70, −0.23), P < 0.01] were also improved. Adding Zhigancao decoction achieved the same effect [total efficiency of RR = 1.34, 95% CI (1.16, 1.54), P < 0.01].

CONCLUSION: Compared with conventional therapy, Yiqi Yangyin prescription can significantly improve the curative effect, increase left ventricular ejection fraction, and reduce left ventricular end diastolic. Thus, it can effectively improve heart function in patients with DCM.

INTRODUCTION

Dilated cardiomyopathy (DCM) is characterized by dilatation and impaired contraction of the left ventricle or both ventricles. It may be idiopathic, familial/genetic, viral and/or immune, alcoholic/toxic, or associated with recognized cardiovascular disease in which the degree of myocardial dysfunction is not explained by the abnormal loading conditions or the extent of ischemic damage. DCM is a main cause of severe heart failure,
especially in children and young adults. The direct result of mononuclear cellular infiltration of the myocardium is necrosis, loss of myocytes, and formation of scar tissue in the myocardium, which leads to loss of contractile function and ventricular enlargement. There is no term for DCM in Chinese medicine; based on its clinical manifestations, it is attributed to “palpitation”, “asthma”, “edema”, “xiongbi”, and consumptive disease. At present, the treatment of heart failure in DCM remains a difficult problem. Routine Western medical approaches, such as blood vessel expansion, and the use of digitalis, diuretics, and other drugs, are still the most common therapies for heart failure in DCM. However, these drugs have many limitations. Chinese medical practitioners treat DCM using Traditional Chinese Medicine, and consider that deficiencies in both Qi and Yin are the internal causes of the disease. The Chinese medical approach to DCM is based on the use of Yiqi Yangyin to treat and improve prognosis of the disease, and this approach has produced good results. There have been many randomized controlled trials (RCT) using Shengmai or Zhigancao decoction and other Yiqi Yangyin classical prescriptions to treat DCM. However, the small sample sizes make it difficult to determine the precise effect of these prescriptions. Therefore, the study aim was to perform a Meta-analysis of all RCTs describing the treatment of DCM with Yiqi Yangyin prescription (Shengmai and Zhigancao decoction) to evaluate its curative effects.

METHODS

Search strategy
Two independent authors searched PubMed, MEDLINE, EMBASE, the Cochrane Library, China National Knowledge Infrastructure Database, Wanfang Database, China Science and Technology Journal Database, and Chinese Biological Medicine from January 1, 1985, to October 31, 2015. Ongoing clinical studies were searched using the ClinicalTrials.gov database. A search strategy was used to retrieve articles from the English databases, and an advanced search strategy was used to retrieve articles from the Chinese databases. Keywords were "Shengmai", "Zhigancao decoction", "Dilated cardiomyopathy", and "randomized controlled trial". Search strategy:
1# YiqiYangyn prescription,
2# Shengmai,
3# Zhigancao decoction,
4# 1# OR 2# OR 3#,
5# dilated cardiomyopathy,
6# "Cardiomyopathy, Dilated" [Mesh],
7# DCM,
8# 5# OR 6# OR 7#,
9# random* OR (randomized controlled trial),
10# 4# AND 8# AND 9#

Study selection
After omitting reviews, letters, conference excerpts, and duplicates, the reviewers screened the titles and abstracts of all potentially eligible articles. Both authors applied the eligibility criteria and created a list of full-text articles through consensus. The reviewers then considered the full texts of these articles and the final list of included articles was reached through consensus. A third reviewer was available for mediation during this process.

Inclusion criteria
To estimate the curative effect of Yiqi Yangyin prescription on DCM, we included (a) all clinical RCTs of Shengmai or Zhigancao decoction treatment for DCM; (b) trials in which DCM was defined according to the 1995 World Health Organization/International Society and Federation of Cardiology Task Force on the Definition and Classification of Cardiomyopathies; (c) and trials which included a clearly defined test group combining conventional Western Medicine treatment with Shengmai or Zhigancao decoction, and control groups for conventional Western Medicine only. These studies included at least one outcome measure, such as total effective rate, excellence rate, left ventricular ejection fraction (LVEF, %), heart rate (HR) per min, and left ventricular end diastolic (LVDd, d/mm).

Data extraction and quality evaluation
Data extraction and quality assessment of the included publications was performed independently by two reviewers using the Cochrane Collaboration’s tool. Any controversy was settled through discussion or with assistance from a third party. When there was insufficient information to permit the evaluation of study quality, it was rated as unclear (uncertain risk of bias). The following information from each article was recorded: the first author, year of publication, development time of the study, the patiets, efficacy evaluation criteria, the number of cases, patient age, duration of disease, drug delivery, and treatment and control group strategies. The outcome parameters required for Meta-analysis were total effective rate, excellence rate, HR, LVDd, and LVEF.

Outcome measures
The Meta-analysis assessed the curative effect of Yiqi Yangyn prescription on DCM. Total effective rate, excellence rate, HR, LVDd, and LVEF were used to evaluate the therapeutic effect of Shengmai. The effect of Zhigancao decoction was evaluated using three outcome measures: total effective rate, excellence rate, and LVEF.

Statistical analysis
Dichotomous outcomes (marked efficiency and total efficiency) were expressed as relative risks (RRs) and 95% confidence intervals (CIs). As the traditional Chinese medicine treatment course could differ between studies, we combined standard mean difference (SMD) with 95% CI for each study for continuous outcomes (LVEF, LVDd, and HR). Heterogeneity was measured using Cochran’s Q statistic and the $I^2$ test, yielding a Chi-square P value or $I^2$ value. In cases of significant
heterogeneity (Cochran’s Q significant at < 0.05; I² > 50%), a random-effects model was used; otherwise, a fixed-effects model was selected. Sensitivity analysis was performed to determine whether removal of each study would impact the pooled result. Egger’s test was conducted to detect publication bias. All statistical analyses were performed using Stata 12.0 (StataCorp LP, Texas, USA) and RevMan 5.3 (Cochrane, London, United Kingdom).

RESULTS

Information retrieval

A total of 442 articles were identified. After screening the titles and abstracts, 79 relevant studies were found. After detailed evaluation of the full text, 19 papers met the review inclusion criteria, of which 15 used Shengmai and 4 used Zhigancao decoction. These 19 articles were all written in Chinese and published between 2000 and 2015 (Figure 1).

Research characteristics

Nineteen RCTs that enrolled 1024 participants were included in the present Meta-analysis. Shengmai was used in 15 of the included trials (treatment group: 421 cases, control group: 344 cases) and Zhigancao decoction was used in 4 studies (treatment group: 133 cases, control group: 126 cases). In all studies, the control group was treated with routine Western Medicine (Tables 1, 2).

Quality evaluation

Several trials failed to provide sufficient details of random sequence generation and allocation concealment; therefore, selection bias was rated as an unknown risk. In addition, most of the studies did not include an analysis plan, so we were unable to judge reporting bias. Of all the included studies, the studies by Jiang and Wang were of relatively high quality (Figures 2-5).

Records identified through database searching (n = 442)
Wanfang (n = 269)
CNKI (n = 80)
VIP (n = 50)
Chinese biological medicine (n = 43)
PubMed, EMBASE, Cochrane library (n = 0)

Articles excluded (n = 363)
Reasons:
duplicates (n = 125)
irrelevant papers (n = 201)
review, conference excerpts, graduation thesis (n = 37)

Full-text and abstract assessed for eligibility (n = 79)

Articles excluded (n = 60)
Reasons:
No control group (n = 27)
No correlation outcome variables (n = 15)
Non dilated ardiomyopathy (n = 11)
The test group was added shengmai and other kinds of Medicine on the basis of conventional treatment (n = 3)
Study on Huangqi Shengmaiyin (n = 4)

Full-text articles included in the Meta-analysis (n = 19)
Shengmai (n = 15)
Zhigancao decoction (n = 4)

Figure 1 Flow chart of literature search
CNKI: China National Knowledge Infrastructure Database; VIP: Chinese Scientific Journals Database.
<table>
<thead>
<tr>
<th>Study</th>
<th>Inclusion time</th>
<th>Inclusion patient</th>
<th>Grouping</th>
<th>Number (man/women)</th>
<th>Age (years)</th>
<th>Duration of treatment</th>
<th>Treatment strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Wu XH et al 2001</td>
<td>1996.06-2000.05</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>28 (16/12)</td>
<td>40.3±15.0</td>
<td>18.1 (1-48) m</td>
<td>Conventional treatment + Shengmai injection 40-60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Zhong SW et al 2000</td>
<td>-</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>30 (18/12)</td>
<td>35.6 (18-58)</td>
<td>6.5 (1.5-10) y</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Guo XJ et al 2003</td>
<td>-</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>30 (20/10)</td>
<td>22-59</td>
<td>-</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Yu JX et al 2002</td>
<td>1995.12-2001.03</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>32 (21/11)</td>
<td>34-54</td>
<td>1-48 m</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Wang YW et al 2002</td>
<td>1999.01-2002.03</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>27 (15/12)</td>
<td>55-22-68</td>
<td>-</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Zhang YC et al 2002</td>
<td>-</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>50</td>
<td>59±18</td>
<td>(4.8±2.4) y</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Wang CL et al 2004</td>
<td>2000.06-2003.06</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>30 (18/12)</td>
<td>46.2 (32-63)</td>
<td>32.4 (7.45) m</td>
<td>Conventional treatment + Shengmai injection 60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Wang H 2006</td>
<td>2002.01-2005.05</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>30 (19/11)</td>
<td>41±15</td>
<td>(3.26±1.17) y</td>
<td>Conventional treatment + Shengmai injection 40-60 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Hui SL et al 2007</td>
<td>2002.02-2007.01</td>
<td>DCM with heart failure</td>
<td>Chinese medicine group</td>
<td>29 (17/12)</td>
<td>57 (24-69)</td>
<td>-</td>
<td>Conventional treatment with Shengmai injection 40 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td>Chen SF 2008</td>
<td>2001.05-2006.05</td>
<td>DCM with heart failure</td>
<td>Chinese medicine group</td>
<td>32 (18/14)</td>
<td>50.3±15.01</td>
<td>-</td>
<td>Conventional treatment with Shengmai injection 50 mL, intravenous drip, 1 times/day, 15 days/course, subsequently oral Shengmai capsule 2 capsules, 3 times a day, 15 days/course</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>20 (11/9)</td>
<td>39.5±13.5</td>
<td>(2.96±1.14) y</td>
<td>Conventional treatment of heart failure</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>29 (17/12)</td>
<td>57 (24-69)</td>
<td>-</td>
<td>Conventional treatment with Shengmai injection 40 mL, intravenous drip, 1 times/day, 15 days/course</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>25 (14/11)</td>
<td>58 (22-72)</td>
<td>-</td>
<td>Conventional treatment with Shengmai injection 50 mL, intravenous drip, 1 times/day, 15 days/course, subsequently oral Shengmai capsule 2 capsules, 3 times a day, 15 days/course</td>
</tr>
</tbody>
</table>
Table 1 Characteristics of the included studies of Shengmai to treat dilated cardiomyopathy (Continued)

<table>
<thead>
<tr>
<th>Study</th>
<th>Inclusion time</th>
<th>Inclusion patient</th>
<th>Grouping</th>
<th>Number (man/women)</th>
<th>Age (years)</th>
<th>Duration of treatment</th>
<th>Treatment strategy</th>
</tr>
</thead>
<tbody>
<tr>
<td>Jiang LH 2009*</td>
<td>2003.06-2008.09</td>
<td>DCM with heart failure</td>
<td>Chinese medicine group</td>
<td>48 (20/28)</td>
<td>54.9±7.23</td>
<td>5 m-5 y</td>
<td>Shengmai injection 40 mL, intravenous drip, 1 times/day, 15 days/course, 3 courses</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>30 (15/15)</td>
<td>57.6±7.06</td>
<td>7 m-6 y</td>
<td>Conventional treatment of heart failure</td>
</tr>
<tr>
<td>Wu XL 2009*</td>
<td>2002.01-2009.07</td>
<td>DCM with heart failure</td>
<td>Chinese medicine group</td>
<td>30 (20/10)</td>
<td>45.81</td>
<td>8 m-7 y</td>
<td>Conventional Western Medicine + Shengmai injection 40 mL, intravenous drip, 1 times/day, 14 days/course</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>30 (22/8)</td>
<td>41.79</td>
<td>7 m-8 y</td>
<td>Oxygen uptake, Conventional Western Medicine</td>
</tr>
<tr>
<td>Zhang HX et al 2012*</td>
<td>2010.01-2011.02</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>20 (11/9)</td>
<td>43.0±8.7</td>
<td>-</td>
<td>Shengmai Baoyuan Tang, decoct with water, oral, 2 times/day, 30 days/course, subsequently oral Shengmai Baoyuan Tang capsule, 0.5g/capsules, 6 capsules, 3 times a day</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>20 (13/7)</td>
<td>42.0±9.2</td>
<td>-</td>
<td>Conventional Western Medicine</td>
</tr>
<tr>
<td>Jiang HD et al 2014*</td>
<td>2008.06-2013.05</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>28 (19/9)</td>
<td>45.0±12.3</td>
<td>1-6 y</td>
<td>Conventional Western Medicine + Shengmai powder, decoct with water, oral, 2 times/day, 28 days/course</td>
</tr>
<tr>
<td>Gong LY et al 2015*</td>
<td>2010.01-2011.12</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>33 (19/14)</td>
<td>38.4±5.40</td>
<td>-</td>
<td>Conventional Western Medicine + Shengmai Baoyuan Tang, decoct with water, oral, 2 times/day, 28 days/course</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>30 (17/13)</td>
<td>38.20±5.20</td>
<td>-</td>
<td>Conventional Western Medicine</td>
</tr>
</tbody>
</table>

Notes: DCM: dilated cardiomyopathy; m: month; y: year. The data show means ± standard deviations or means (ranges).

Table 2 Characteristics of the included studies of Zhigancao to treat dilated cardiomyopathy

<table>
<thead>
<tr>
<th>Study</th>
<th>Inclusion time</th>
<th>Inclusion patient</th>
<th>Grouping</th>
<th>Number (man/women)</th>
<th>Age (years)</th>
<th>Duration of treatment</th>
<th>Treatment strategies</th>
</tr>
</thead>
<tbody>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>31 (17/14)</td>
<td>40.6±3.5</td>
<td>-</td>
<td>Conventional Western Medicine</td>
</tr>
<tr>
<td>Yang HY et al 2008*</td>
<td>2002.01-2007.06</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>35 (21/14)</td>
<td>41 (30-41)</td>
<td>-</td>
<td>Conventional treatment + Zhigancao Tang</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>30 (19/11)</td>
<td>42 (28-63)</td>
<td>-</td>
<td>Conventional Western Medicine</td>
</tr>
<tr>
<td>Wang QG et al 2009*</td>
<td>2002.09-2005.09</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>35 (20/15)</td>
<td>38.7±4.5</td>
<td>3.8±0.4</td>
<td>Conventional treatment + Zhigancao Tang</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>35 (22/13)</td>
<td>40.9±3.8</td>
<td>3.9±0.6</td>
<td>Conventional Western Medicine</td>
</tr>
<tr>
<td>Huang QY 2012*</td>
<td>-</td>
<td>DCM</td>
<td>Chinese medicine group</td>
<td>32 (20/12)</td>
<td>47.8 (41-78)</td>
<td>3.1 (1-11)</td>
<td>Conventional treatment + Zhigancao Tang</td>
</tr>
<tr>
<td></td>
<td></td>
<td></td>
<td>Control group</td>
<td>30 (19/11)</td>
<td>45.6 (40-73)</td>
<td>3.2 (1-12)</td>
<td>Oxygen uptake, limiting salt, conventional treatment</td>
</tr>
</tbody>
</table>

Notes: DCM: dilated cardiomyopathy; m: month; y: year. The data show means ± standard deviations or means (ranges).
Effect of Shengmai on DCM

Thirteen studies\(^6-9,11-13,15-20\) reported the total effective rate (total effective rate = excellence rate + effective rate). There was a statistically significant difference in the total effective rate between Shengmai groups (421 cases) and conventional treatment groups (344 cases) [fixed-effects model: \(RR = 1.32; 95\% CI (1.22, 1.43); P = 0.54; I^2 = 0\%\)]. Addition of Shengmai increased the total effective rate (Egger’s test: \(P = 0.01\)). There was significant publication bias among the various studies (Figures 6, 7).

The Meta-analysis of excellence rate was based on 12 RCTs (Shengmai groups, 391 cases; conventional treatment groups, 314 cases). The excellence rate was statistically and significantly improved by addition of Shengmai [fixed-effects model: \(RR = 1.70; 95\% CI (1.37, 2.10); I^2 = 0\%\)]. There was no significant publication bias (Egger’s test: \(P = 0.66\)) (Figures 8, 9).

Ten studies\(^6,7,9,10,11,14,15,18-20\) reported the LVEF. Pooled analysis of the overall study cohorts revealed a significant increase in the LVEF in groups receiving additional Shengmai treatment [random-effects model: \(SMD = 1.13, 95\% CI (0.55, 1.70)\)]. Furthermore, there was a beneficial effect of Shengmai on LVEF after a sensitivity analysis was performed to address the significant heterogeneity between studies (\(I^2 = 90\%\), \(P < 0.01\)). Meta-analysis of five studies\(^7,12,16,19,20\) revealed a significant reduction in LVDd with the addition of Shengmai [fixed-effects model: \(SMD = 0.64, 95\% CI (-0.23, 0.23)\)]. Five studies\(^6,9,14,15,17\) reported changes in HR before and after treatment. There was significant heterogeneity (\(P < 0.01, I^2 = 84\%\)). Using a random-effects model to combine the results revealed no significant between-group difference in HR change [\(SMD = -0.54, 95\% CI (-1.15, 0.06); P = 0.08\)]. Egger’s test showed significant publication bias (\(P = 0.003\)) (Figure 10).

Effect of Zhigancao decoction on dilated cardiomyopathy

Four RCTs\(^21-24\) of Zhigancao decoction with 259 parti-
pants (Zhigancao decoction treatment group: 133 cases, conventional treatment group: 126 cases) were included in the present Meta-analysis. All four trials\textsuperscript{21,24} reported the total effective rate and excellence rate, and three studies\textsuperscript{21,22,24} reported the LVEF changes. There was a significant difference in total effective rate and excellence rate between Zhigancao decoction and conventional treatment groups [total effective rate: fixed-effect \( RR = 1.34; 95\% \ CI (1.16, 1.54); P = 0.20; I^2 = 35\% \); excellence rate: fixed-effect \( RR = 1.84; 95\% \ CI (1.30, 2.61); P = 0.93; I^2 = 0\% \)]. There was an increasing trend toward in the LVEF of Zhigancao decoction groups [fixed-effect \( SMD = 0.71; 95\% \ CI (0.41, 1.01); P = 0.18; I^2 = 42\% \)] (Figure 11).

**Sensitivity analysis**

Sensitivity analysis showed that the pooled results were consistent with the original results after eliminating the included studies one-by-one, and the overall outcomes were not reversed. The results showed that the Meta-analysis was relatively stable.

**DISCUSSION**

This paper mainly evaluated the curative effect of Yiqi Yangyin prescription (Shengmai and Zhigancao decoction) in treatment of DCM. After rigorous screening, 19 Chinese articles were included in this Meta-analysis. We found heterogeneity between the studies, which was probably a result of differences in the course of Traditional Chinese Medicine treatment across the included studies. Despite the reference standard, study quality may have contributed to the heterogeneity of the results. In addition, there are region-related health differences in China; therefore, individual patient differences across the included studies may explain differences in patient recovery.

The present Meta-analysis demonstrates that Yiqi Yangyin prescription can significantly improve treatment efficiency, increase LVEF, reduce LVDD, and improve heart function, compared with conventional Western Medicine treatment.

This Meta-analysis had several limitations. First, the validity of our results was dependent on the validity of the included studies, and we did not include patient-level data. Second, although the number of articles included was large, the overall sample size of the study population was relatively small. Thus, type II error may explain some of the negative findings. Third, studies reporting the total effective rate and LVEF showed significant publication bias. Heterogeneity between studies may represent a potential source of bias in a Meta-analysis, and further studies are required featuring large high quality RCTs to improve the quality of Meta-analysis.

In conclusion, this Meta-analysis indicates that addition of Shengmai or Zhigancao decoction can significantly improve curative efficiency, increase LVEF, and decrease LVDD compared with conventional treatment. Therefore, Yiqi Yangyin prescription can effectively improve cardiac function in patients with DCM.
REFERENCES


8. Guo XJ, Wang Q, Wang Y. Clinical observation on the


Figure 9 Results of Egger's test: publication bias plot of excellence rate (Shengmai).

Figure 10 Meta-analysis for comparison of left ventricular ejection fraction, left ventricular end diastolic, and heart rate between Shengmai and Western Medicine.

A: left ventricular ejection fraction; B: left ventricular end diastolic; C: heart rate.
Soup (SMBY) on treatment of dilated cardiomyopathy.
Lin Chuang Xin Xue Guan Bing Za Zhi 2012; 2012(02): 101-103.


