

## Review

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# Clinical Efficacy of Acupoint Massage Versus Normal Treatments for Acute Mastitis: A Systematic Review

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## Abstract

**Objective:** To systematically review the effectiveness of acupoint massage versus normal treatments for acute mastitis.

**Methods:** Databases including CNKI, Wanfang database, VIP, Pubmed, Web of science and Cochrane were searched to collect randomized controlled trials (RCTs) about acupoint massage versus normal treatments for acute mastitis from inception to October 2018. Two reviewers independently screened literature, extracted data, and assessed the risk of bias of included studies. Then meta-analysis was performed using RevMan 5.3.3 software.

**Results:** A total of 16 RCTs involving 2 056 patients were included. The results of meta-analysis showed that, compared with normal treatments, acupoint massage could improve the efficiency of clinical treatment [RR = 1.18, 95% CI (1.13, 1.22),  $P < 0.00001$ ], shorten onset time [MD = -1.69, 95% CI (-1.89, -1.41),  $P < 0.00001$ ], decrease the lump size [MD = -2.64, 95% CI (-4.46, -0.82),  $P = 0.005$ ], and decrease the score of symptoms and signs [MD = -3.88, 95% CI (-7.50, -0.27),  $P = 0.04$ ]. However, there was no significant difference in recurrence rate [RR = 0.41, 95% CI (0.11, 1.57),  $P = 0.19$ ] and cure rate [RR = 11.82, 95% CI (0.50, 282.04),  $P = 0.13$ ].

**Conclusion:** The current evidence shows that, compared with normal treatments, acupoint massage can improve the efficiency of clinical treatment, shorten the onset time, and decrease the lump size. Due to the limited quality of included studies, more high quality studies are needed to verify the above conclusion.

**Key words:** Acupoint massage; Acute mastitis; Effectiveness; Systematic review; Meta-analysis

## Introduction

Acute mastitis, also known as “ruyong” in traditional Chinese medicine (TCM), is a common and frequently occurring disease in breast-feeding woman, mostly in primipara<sup>[1]</sup>. Study reported that the incidence of acute mastitis is 33%. And it is easy to recurrence<sup>[2]</sup>. Timely and

correct treatment can cure the disease completely. However, if the treatment wasn't timely, the disease could develop into breast abscess, which not only increases patients' pain, but also causes cessation of breastfeeding<sup>[3]</sup>. Causes of acute mastitis include liver depression and qi stagnation, and stomach heat. Methods of soothing liver and relieving depression are used in TCM. Acupoint massage is an effective Chinese nursing technology to dredge the channel and balance yin and yang. It refers to the special

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manipulation applied to the special position of human body to stimulate the acupoints of meridians and collaterals so as to achieve the purpose of dredging tendons and collaterals, activating blood circulation and removing blood stasis<sup>[4]</sup>. Acupoint massage technology is also called finger point massage, manipulation, acupoint finger pressure, massage, etc. Its essence is acupoint massage. At present, it has a good effect in clinical treatment<sup>[5-6]</sup>. This study intends to use evidence-based medicine to comprehensively retrieve the randomized controlled trials of acupoint massage in the treatment of breast mastitis at home and abroad, and evaluate its efficacy, in order to obtain evidence of the efficacy and advantages of acupoint massage, so as to promote clinical development.

## Resource and Method

### Study type

Random controlled trials are included which random list and grouping methods are made correct, regardless whether allocation hiding and blind methods are used.

### Study object

Acute mastitis patients whose age was over 18 years old were the study objects. Diagnosis referred to books *Surgery* and *Chinese Medicine Surgery*. Diagnosis criteria<sup>[7]</sup>: (1) Initial breast milk discharge was not smooth, breast swelling and pain is intolerable. There were caked mass, skin color was not red or reddish, the body was often accompanied by cold, fever, headache, loss of appetite, dry stool and other symptoms. (2) Chapped nipples were infected with pathogenic factors, the discharge of milk was not smooth. (3) Check the affected breast for swelling, fever, tenderness, local hardening, mass (strip-like), axillary lymph node enlargement. (4) The total number of white blood cells and neutrophils increased.

### Intervention measures

Control group should adopt treatment and nursing besides acupoint massage, while trial group should add acupoint massage or simply adopt acupoint massage on the basis of the control group. Acupoint massage techniques are as follows: operator holds up the affected breast with one hand, gently squeezes the areola with the other hand, and

combines pushing, kneading and pressing techniques to dredge breast lumps, help patients discharge the accumulated breast milk, repeat the above operations until the milk is exhausted and the breast becomes soft.

### Outcome indexes

Effective rate is the first outcome indicator. According to the *Guiding Principles for Clinical Research of New Chinese Medicine*<sup>[8]</sup>: (1) cure: symptoms disappear, mass dissipation, breast milk excretion is normal, white blood cell count is normal by blood routine examination; (2) marked effect: symptoms and signs are obviously reduced, mass dissipation is more than 60%, breast milk excretion is basically smooth, white blood cells are normal by blood test; (3) effective: symptoms and signs are improved, lumps are reduced, and white blood cells are normal by blood test. Breast milk expression is smooth. (4) ineffective: symptoms and signs are not alleviated, or breast has pus.

The secondary outcome indicators included onset time, mass size, recurrence rate, cure rate and score of symptoms and signs

Calculation method: effective rate = (cure + marked effective) cases / total cases × 100%, cure rate = cure cases / total cases × 100%. The onset time is calculated according to the number of days. The size of the mass was calculated according to the length and diameter of the mass, and the grading score was as follows: (1) 0 points: the mass disappeared; (2) 2 points: the mass < 2 cm; (3) 4 points: 2 cm < the mass < 4 cm; and (4) 6 points: the mass > 4 cm<sup>[9-10]</sup>.

According to the *Guiding Principles for Clinical Research of New Chinese Medicine*<sup>[9-10]</sup>, score of symptoms and signs was graded as follows: (1) grade 4: Lack of excretion of breast milk, accumulation of lumps or breast swelling and pain (2) grade 3: Local skin burning, irritability/thirst/constipation; (3) grade 2: Fever, headache/body pain and pulse; (4) grade 1: No disease's symptom or sign. The specific scoring criteria are shown in Table 1.

### Exclusion criterion

Repeated publication and inaccessibility of full-text were excluded.

**Table 1 Score of symptoms and signs**

+Symptoms	Score (Points)			
	0	1	2	3
Breast milk expression	Normal	Just a little bit unsmooth	Unsmooth	Unable to drain, drip down, or accumulate agglomeration
Mass	No	Lump size<10 cm	10 cm≤Lump size<30 cm	Lump size≥30 cm
Engorgement	No	Light but obvious	Bearable	Unbearable
Local skin color and burning sensation	No	Skin is normal and slightly heat	Skin is reddish and hot	
Irritability/thirst/constipation	No	Slight	Obvious	
Headache/body pain	No	Yes		
Aversion to cold/fever	No	Yes		
Pulse	Normal	Quick pulse		

**box 1 Retrieval strategy of pubmed**

#1 acupoint massage  
 #2 acupuncture points[MeSH Terms]  
 #3 fingers point  
 #4 #1 OR #2 OR #3  
 #5 acute mastitis  
 #6 lactation mastitis  
 #7 #5 OR #6  
 #8 #4 AND #7

**Retrieval strategy**

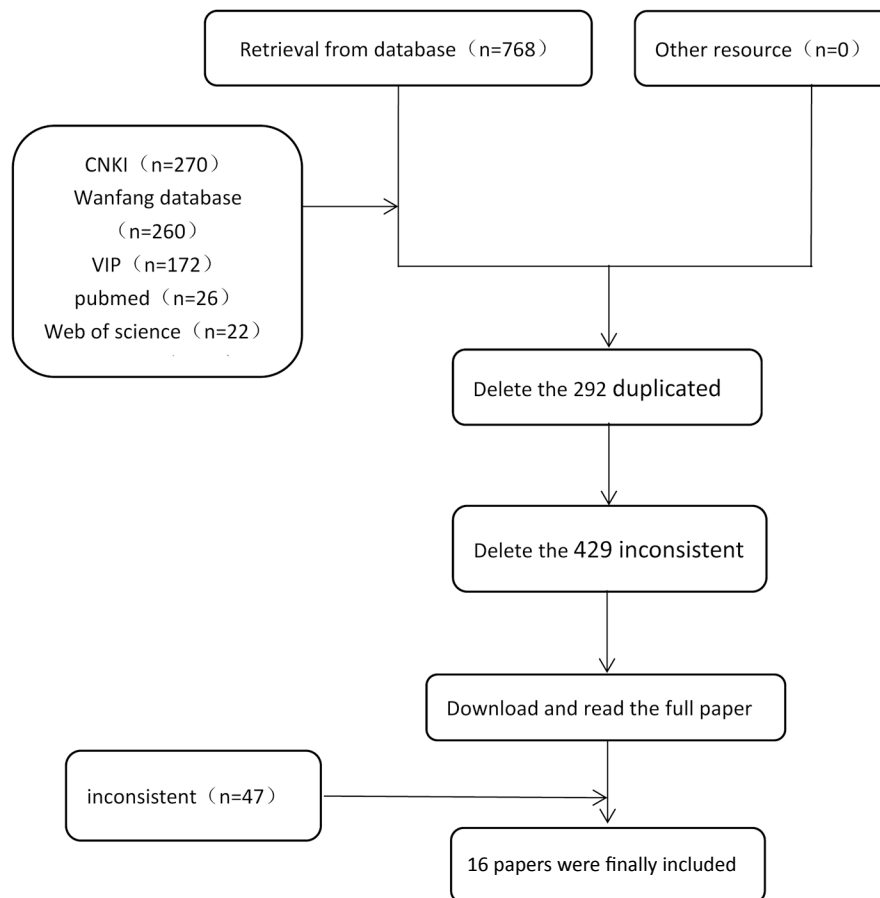
Retrieve relevant documents from CNKI, Wanfang database, VIP, PubMed, Web of science, and Cochrane and other databases. The retrieval time was from the establishment of the database to October 2018. At the same time, the references included in the literature were searched. Search terms are combined with subject words, keywords and free words. Search terms include acupoint massage, acupuncture points, fingers point, acute mastitis, lactation mastitis. Taking PubMed as an example, the specific retrieval strategy was shown in box 1.

**Document quality evaluation**

Evaluation content was based on Cochrane Handbook-5.1.0, and 2 researchers separately evaluate the quality of papers<sup>[11]</sup>. Contents of the evaluation: random sequence generation, allocation concealment, blinding of participants and personnel, blinding of outcome assessment, incomplete outcome data, selective reporting and other source of bias. Evaluation results include “low risk of bias”, “high risk of bias” and “unclear”.

**Statistical analysis**

Review Manager 5.3.3 was used to analyse the data.  $\chi^2$  test was used to test whether there is heterogeneity between studies. If  $P < 0.05$  and  $I^2 \geq 50\%$ , fixed effects model (FEM) is used for heterogeneity between studies is low and homogeneity is high. If  $P > 0.05$ ,  $I^2 \leq 50\%$ , it shows that the heterogeneity of the study is large, and random effects model (REM) should be used. Weighted Mean Difference (WMD) is used for continuous variable data. In order to merge the effects, the relative risk (RR) value is used to merge the effects, and 95% confidence intervals (CI) were given for each effect,  $P < 0.05$  shows that there was significant difference.



**Figure 1 The specific retrieval process of literatures**

## Results

### *Literature screening results*

A total of 768 papers were retrieved, including 270 articles from CNKI, 260 articles from Wan-fang Data, 172 articles from VIP, 26 articles from PubMed, 22 articles from Web of Science, 18 articles from Cochrane. Of all, 292 duplicated and 429 inconsistent papers were deleted. The remaining papers were downloaded to read the full text to select. Finally, 16 final papers were included and judged. The specific retrieval process is shown in Figure 1.

### *Features of the inclusion*

All of the included 16 papers were Chinese papers. The types of experimental studies were randomized controlled trials. A total of 2 056 patients were enrolled, and 1 070 patients received acupoint massage. The specific features

included in the study are shown in Table 2.

### *Quality of included papers*

Random sequence generation: 2 papers<sup>[13,20]</sup> used random number table method, 1 paper<sup>[17]</sup> used lottery method, and the rest of the papers did not mention the method of generating random sequence. Allocation concealment weren't mentioned in all paper. Blinding of participants and personnel: There was no mention of the use of blindness in all literature, but because of the different intervention measures between the trial group and the control group, it was easy to break the blindness, so it was judged to be high risk. Blinding of outcome assessment: There were 2 outcomes<sup>[12,13]</sup> are objective indicators, including treatment time and mass removal time, *etc.* The evaluation results were less affected by the measurers, so the judgement was low bias. The remaining outcomes indicators were effective

**Table 2 Basic features of included papers**

Author(year, location)	Case load		Intervention measures		Outcome indicators	Journal
	Trial group	Control group	Trial group	Control group		
Ling wenjin <i>et al.</i> <sup>[12]</sup> (2011, Guilin)	61	52	Acupoint massage	Cefazolin	Effective rate	Guangxi Journal of Traditional Chinese Medicine
Ou yi <sup>[13]</sup> (2014, Guangdong)	60	60	Acupoint massage +magnesium sulfate hot/ wet dressing	Magnesium sulfate hot/ wet dressing	Effective rate; onset time	Guide of China Medicine
Xue lihua <i>et al.</i> <sup>[14]</sup> (2017, Beijing)	140	120	Acupoint massage +routine treatment	Routine treatment	Effective rate; recurrence rate	Chinese Journal of Disaster Medicine
Zhang lili <sup>[10]</sup> (2012, Heilongjiang university of Chinese medicine)	60	60	Acupoint massage	Gualouniubang decoction	Effective rate; score of symptoms and signs	Heilongjiang university of Chinese medicine
Liu xiaofeng <i>et al.</i> <sup>[15]</sup> (2014, Shandong)	250	250	Acupoint massage +Decoction	Decoction	Effective rate	Contemporary Medical Journal
Xu guoshun <i>et al.</i> <sup>[16]</sup> (2016, Xinjiang)	17	17	Acupoint massage +penicillin	Penicillin	Effective rate	Xinjiang Medical Journal
Tian yanling <i>et al.</i> <sup>[17]</sup> (2012, Ningxia)	42	42	Acupoint massage +microwave therapy	Microwave therapy	Cure rate	Ningxia Medical Journal
Bao yurong <sup>[18]</sup> (2016, Jilin)	26	26	Acupoint massage +microwave treatment	Microwave treatment	Effective rate; onset time	Modern Health Journal
Gao xueqing <i>et al.</i> <sup>[19]</sup> (2011, Hubei)	42	42	Acupoint massage+ Anti-infective therapy	Anti-infective therapy	Effective rate	Modern Journal of Integrated Traditional Chinese and Western Medicine
Shi hongjian <i>et al.</i> <sup>[20]</sup> (2016, Hubei)	40	40	Acupoint massage	Antibiotic	Effective rate; score of symptoms and signs; recurrence rate	Guiding Journal of Traditional Chinese Medicine and Pharmacology
He jiaoer <i>et al.</i> <sup>[21]</sup> (2010, Ningbo)	38	38	Acupoint massage +Chaihusanjie decoction	Chaihusanjie decoction	Effective rate	Shandong Journal of Traditional Chinese Medicine
Zhou min <i>et al.</i> <sup>[22]</sup> (2007, Shanghai)	32	32	Acupoint massage	Cefradine	Effective rate; lump size; score of symptoms and signs	Jiangsu Journal of Traditional Chinese Medicine
Feng Yan-hua <sup>[23]</sup> (2004, not mention)	32	16	Acupoint massage	Jinhuang powder	Effective rate	journal of acupuncture of tuina science
Yu yining <sup>[24]</sup> (2001, Taiyuan)	69	59	Acupoint massage +Ultrashort wave therapy	Ultrashort wave therapy	Effective rate	Journal of Shanxi Medical University
Li ziyu <sup>[25]</sup> (not mention, Tangshan)	63	37	Acupoint massage	Routine treatment	Cure rate	No mention
Zhou min <i>et al.</i> <sup>[26]</sup> (2009, Shanghai)	99	99	Acupoint massage	Cefradine	Effective rate; score of symptom and sign; lump size	Journal of Integrated Traditional Chinese and Western Medicine

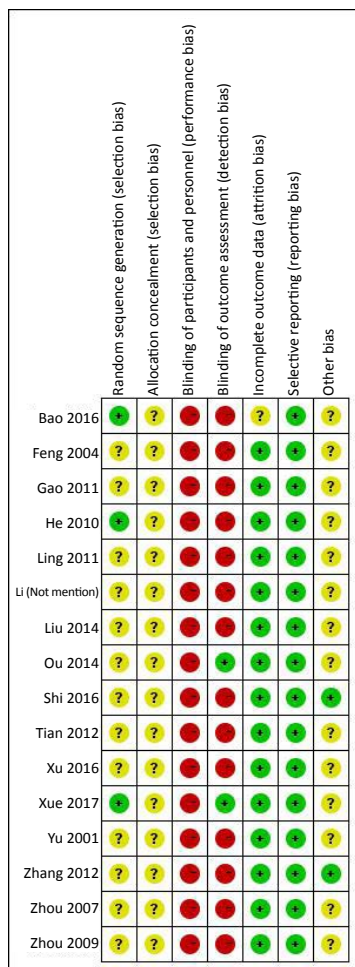


Figure 2 Bias analysis figure

rate, subjective influenced by the measurers was greater, judgement was high bias. Incomplete outcome data: All studies reported complete outcomes. Detailed descriptions of cases and causes of abscission were provided. The contents of reports were consistent. Therefore, incomplete outcomes data and selective reporting bias were judged to be low bias. Selective reporting: There was one literature<sup>[14]</sup> which introduced the research content and methods in detail. Other bias was less likely to occur and all papers were judged low bias. The specific situation was shown in Figure 2.

### Meta-analysis results

**Effective rate:** Fourteen papers<sup>[10,12-16,18-24,26]</sup> were included in this study, which used effective rate as an outcome indicator. The subjects included 1 873 patients. By  $\chi^2$  test, the heterogeneity was small ( $P=0.86$ ,  $I^2=0\%$ ). Therefore, a fixed model was used for analysis. The results showed

that compared with the control group, the effective rate of acupoint massage in the treatment of acute mastitis was high, the difference was statistically significant [ $RR=1.18$ , 95% CI (1.13, 1.22),  $P<0.00001$ ]. The result was shown in Figure 3.

**Onset time:** Three studies<sup>[13,14,18]</sup>, in which a total of 432 patients were included, compared the onset time of acupoint massage in the treatment of acute mastitis. The results of  $\chi^2$  test showed that the heterogeneity among the 3 studies was small ( $P=0.72$ ,  $I^2=0\%$ ). Fixed models were used for analysis. The results showed that the effect of acupoint massage group was faster than that of routine treatment group, and the difference was statistically significant [ $MD=-1.69$ , 95% CI (-1.89, -1.41),  $P<0.00001$ ]. The result was shown in Figure 4.

**Lump size:** Two studies<sup>[22,26]</sup> compared the lump size after treatment, a total of 257 patients. Results of  $\chi^2$  test showed that heterogeneity between the 2 studies was high ( $P<0.0001$ ,  $I^2=94\%$ ). Random models were used for analysis. The results showed that it can effectively reduce the lump size of acupoint massage when compared with control group. The difference was statistically significant [ $MD=-2.64$ , 95% CI (-4.46, -0.82),  $P=0.005$ ]. The result was shown in Figure 5.

**Recurrence rate:** Two studies<sup>[14,20]</sup> compared recurrence rate of acupoint massage, a total of 340 patients were included. Results of  $\chi^2$  test showed that heterogeneity between the 2 studies was high ( $P=0.06$ ,  $I^2=71\%$ ). Random model were used for analysis. The results showed that there is no difference between acupoint massage group and control group [ $RR=0.41$ , 95% CI (0.11, 1.57),  $P=0.19$ ]. The result was shown in Figure 6.

**Cure rate:** Two studies<sup>[17,25]</sup> compared cure rate, a total of 184 patients. Results of  $\chi^2$  test showed that heterogeneity between the 2 studies was high ( $P=0.04$ ,  $I^2=77\%$ ). Random model were used for analysis. The results showed that there was no difference between acupoint massage group and control group [ $RR=11.82$ , 95% CI (0.50, 282.04),  $P=0.13$ ]. The result was shown in Figure 7.

**Score of symptoms and signs:** Three studies<sup>[10,20,22]</sup>

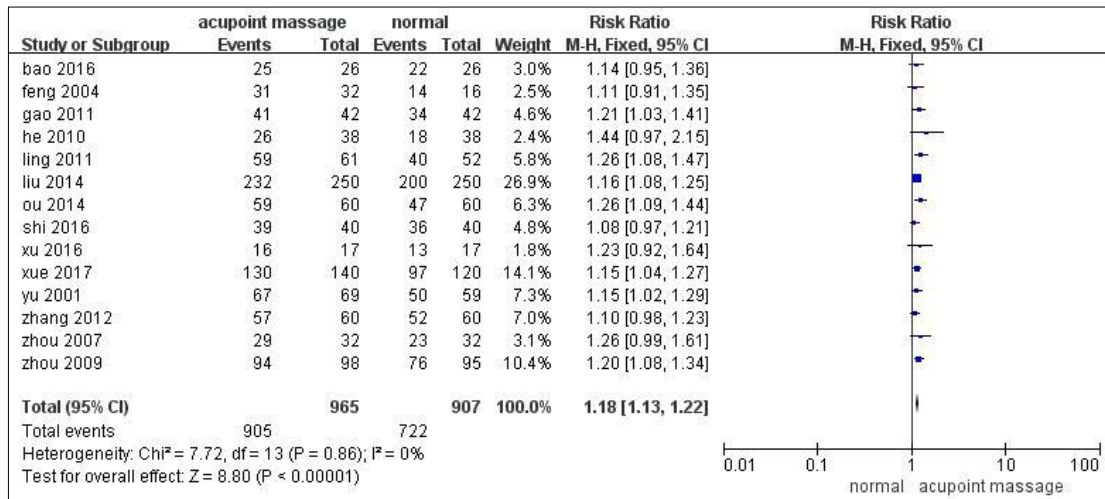


Figure 3 Meta-analysis on effective rate of acupoint massage

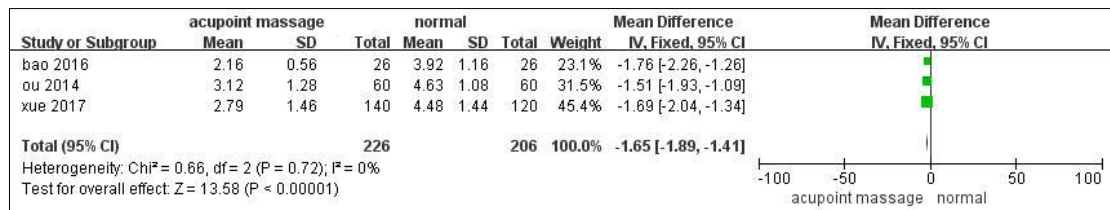


Figure 4 Meta-analysis on onset time of acupoint massage

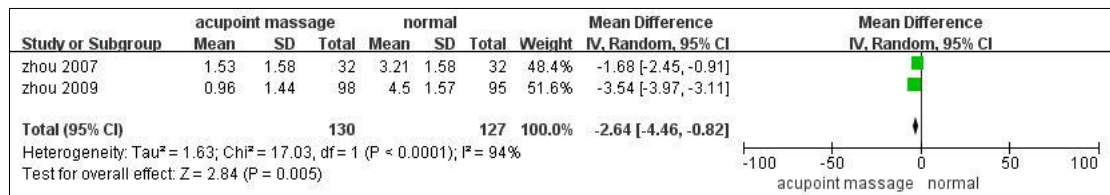


Figure 5 Meta-analysis on lump size of acupoint massage

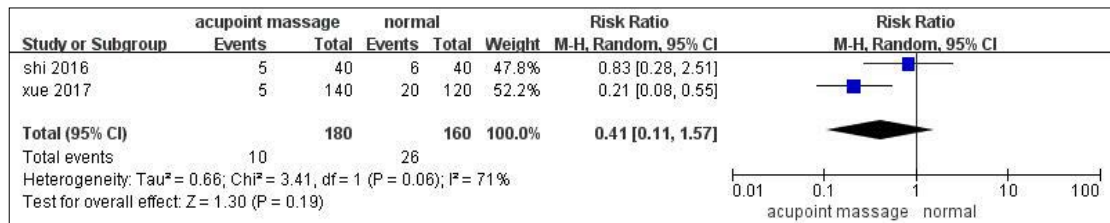


Figure 6 meta-analysis on recurrence rate of acupoint massage

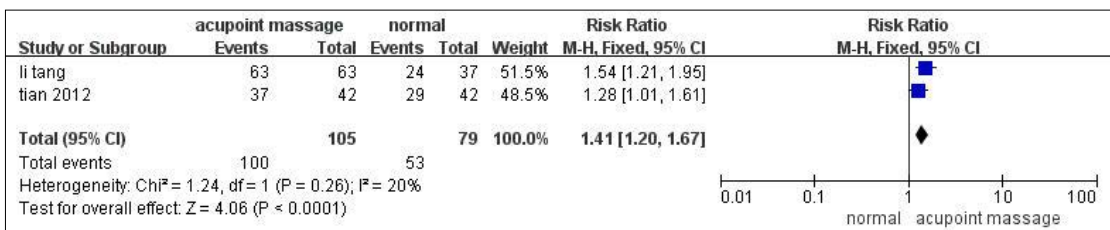


Figure 7 Meta-analysis on cure rate of acupoint massage

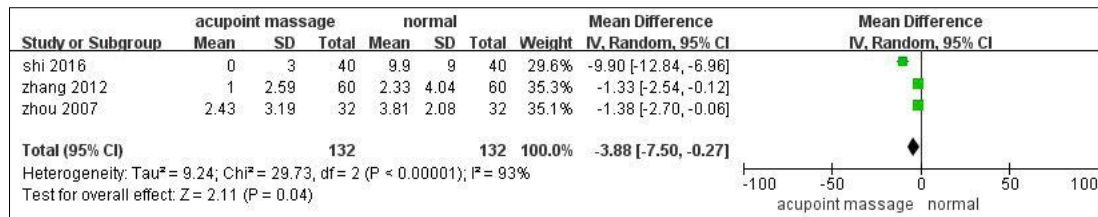


Figure 8 Meta-analysis on score of symptom and sign of acute massage

compared score of symptoms and signs, a total of 264 patients were included. Results of  $\chi^2$  test showed that heterogeneity between the three studies was high ( $P < 0.00001$ ,  $I^2 = 93\%$ ). Random model were used for analysis. The results showed that score of symptoms and signs was higher than that of routine treatment group, and the difference was statistically significant [MD = -3.88, 95% CI (-7.50, -0.27),  $P = 0.04$ ]. The result was shown in Figure 8.

## Discussion

### *Acupoint massage can improve the efficiency of the treatment and promote the recovery of acute mastitis*

Acupoint massage belongs to the category of external treatment of TCM. It is safe, non-invasive and effective and is easy to be accepted<sup>[27]</sup>. As an important part of TCM, acupoint massage can not only dredge channels and collaterals, stimulate relevant acupoints, but also can promote the discharge of breast milk, alleviate symptoms and promote patients' recovery. Gong's research<sup>[9]</sup> shows that acupoint massage can accelerate the discharge of accumulated milk and promote the smooth of breast duct, thereby alleviating local swelling, in-duration, pain and other symptoms.

The results showed that the effective rate of acupoint massage was significantly better than that of the control group. In addition, it produces quick results and has an obvious effect on reducing breast mass, which is consistent with the conclusions of Gong shangqun *et al.*<sup>[7]</sup>. The results showed that there was no significant difference between acupoint massage and routine treatment group in reducing recurrence rate and improving cure rate. This could be related to the low quality of the included literature and

fewer samples. The results of this study still need to be further confirmed. Large-scale, high-quality randomized controlled studies are expected to be carried out<sup>[28]</sup>.

### *Study quality evaluation*

16 papers were studied and 10 were of low quality. Main problems are as follows: (1) Random allocation: only 3 of the 16 papers mentioned random allocation methods, such as random number table method, lottery method, *etc.* There is bias risk for remaining 13 papers for not explaining the random grouping method. (2) Blind method: because of the particularity of the experiment, it is difficult to implement blind method for operators and subjects, only for outcome measurers. However, the inclusion studies did not mention the implementation of blind method for outcome measurers, so there is bias' risk; (3) Other possible bias are unable to be determined for insufficient information of the included papers.

### *Limitations of research*

The combined results of this study can effectively illustrate that acupoint massage can promote the recovery of acute mastitis and shorten the onset time, but there are some limitations: (1) Articles included in this study is Chinese literature (although there is an English article, but it is an English version of Chinese journals); (2) The quality of literature is generally low, large samples of high-quality RCTs still need to be studied. These limitations reduce the effect of meta-analysis and have a certain impact on the spread and development of acupoint massage in the treatment of acute mastitis.

### *Brief summary*

The study on acute mastitis has a long history in TCM. Theory of various pathogenic factors mentioned that

blood and *qi* do not flow and heat is accumulated in breast milk that causes breast swelling. If the swelling does not disperse, it will become acute mastitis<sup>[29]</sup>. *Danxi's Mastery of Medicine* records that timely discharge of milk is conducive to promoting disease recovery and preventing the occurrence of acute mastitis<sup>[30]</sup>. Acupoint massage is important manipulation in the treatment of acute mastitis in TCM, which has been paid much attention by ancient physicians and modern scholars. However, there is still a lack of high-quality systematic evaluation of the efficacy of acupoint massage. By meta-analysis, we find out that acupoint massage can significantly improve the efficiency, and it is suitable for clinical application.

## Declaration

The authors declare that they have no competing interests.

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