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 primipara³¹. Study reported that the incidence of acute mastitis is 33%. And it is easy to recurrence³². 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 breastfeeding³³. 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
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. 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. 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 refered to books Surgery
and Chinese Medicine Surgery. Diagnosis criteria:[7]
(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:[3] (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.

According to the Guiding Principles for Clinical Research
of New Chinese Medicine,[9-10] 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.
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\cite{11}. 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 $I^2\geq50\%$, fixed effects model (FEM) is used for heterogeneity between studies is low and homogeneity is high. If $P>0.05$, $I^2\leq50\%$, 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.

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
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\textsuperscript{12,20} used random number table method, 1 paper\textsuperscript{17} 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\textsuperscript{12,13} 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
| Author(year, location) | Case load | Intervention measures | Outcome indicators | Journal |
|------------------------|-----------|-----------------------|--------------------|---------|
|                        | Trial group | Control group | Trial group | Control group |                  |
| Ling wenjin et al.(12)(2011, Guilin) | 61 | 52 | Acupoint massage | Cefazolin | Effective rate | Guangxi Journal of Traditional Chinese Medicine |
| Ou yi(13)(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 et al.(14)(2017, Beijing) | 140 | 120 | Acupoint massage +routine treatment | Routine treatment | Effective rate; recurrence rate Effective rate; onset time | Chinese Journal of Disaster Medicine |
| Zhang liti (10)(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 et al.(15) (2014, Shandong) | 250 | 250 | Acupoint massage +Decoction | Decoction | Effective rate | Contemporary Medical Journal |
| Xu guoshun et al.(16)(2016, Xinjiang) | 17 | 17 | Acupoint massage +penicillin | Penicillin | Effective rate | Xinjiang Medical Journal |
| Tian yanling et al.(17) (2012, Ningxia) | 42 | 42 | Acupoint massage +microwave therapy | Microwave therapy | Cure rate | Ningxia Medical Journal |
| Bao yurong(18) (2016, Jilin) | 26 | 26 | Acupoint massage +microwave therapy | Microwave treatment | Effective rate; onset time | Modern Health Journal |
| Gao xueqing et al.(19) (2011, Hubei) | 42 | 42 | Acupoint massage+ Anti-infective therapy | Anti-infective therapy | Effective rate Effective rate; score of symptoms and signs; recurrence rate | Modern Journal of Integrated Traditional Chinese and Western Medicine |
| Shi hongjian et al.(20) (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 jiaor et al.(21) (2010, Ningbo) | 38 | 38 | Acupoint massage +Chaihusanjie decoction | Chaihusanjie decoction | Effective rate | Shandong Journal of Traditional Chinese Medicine |
| Zhou min et al.(22)(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(23) (2004, not mention) | 32 | 16 | Acupoint massage | Jinhuang powder | Effective rate | Journal of acupuncture of tuina science |
| Yu yining(24)(2001, Taiyuan) | 69 | 59 | Acupoint massage +Ultrashort wave therapy | Ultrashort wave therapy | Effective rate | Journal of Shanxi Medical University |
| Li ziyu (25)(not mention, Tangshan) | 63 | 37 | Acupoint massage | Routine treatment | Cure rate | No mention |
| Zhou min et al.(26) (2009, Shanghai) | 99 | 99 | Acupoint massage | Cefradine | Effective rate; score of symptom and sign; lump size | Journal of Integrated Traditional Chinese and Western Medicine |
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 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 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, 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 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 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 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=1.82, 95% CI (0.50, 282.04), \( P=0.13 \)]. The result was shown in Figure 7.

Score of symptoms and signs: Three studies
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

| Study or Subgroup | acupoint massage | Normal | Mean Difference | Mean Difference |
|------------------|------------------|--------|----------------|----------------|
|                  | Mean  | SD    | Total | Mean  | SD    | Total | IV, Random, 95% CI | IV, Random, 95% CI |
| Chai 2014        | 0     | 1     | 40    | 0.9   | 0     | 40    | 23.6% | -0.00 [-12.04, -0.08] |
| Zhang 2012       | 1     | 2.51  | 80    | 2.23  | 4.9   | 80    | 55.3% | -1.33 [-2.54, -0.12] |
| Zhou 2009        | 2.43  | 3.19  | 32    | 3.61  | 2.98  | 32    | 95.1% | -1.38 [-2.74, -0.06] |
| Total (95% CI)   | 132   | 132   | 100.0% | -3.88 [-7.50, -0.27] |

Heterogeneity: $\chi^2 = 28.73, df = 6 (P = 0.00001), I^2 = 93\%$

Test for overall effect: $Z = 2.11 (P = 0.04)$

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[27]. 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[9] 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.[7]. 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[28].

**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[29]. Danxi’s Mastery of Medicine records that timely discharge of milk is conductive to promoting disease recovery and preventing the occurrence of acute mastitis[30]. 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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