Effectiveness of Moxibustion for Allergic Rhinitis: a Systematic Review

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Research Article

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Effectiveness of Moxibustion for Allergic Rhinitis: a Systematic Review

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Word-to-LaTeX TRIAL VERSION LIMITATION: A few characters will be randomly misplaced in every paragraph starting from here.

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Key words
single moxibustion; thunder fire moxibustion; heat-sensitive moxibustion; hbrb-partitioned moxibustion; governor vessel moxibustion; allergic rhinitis; Mita

Abbreviations
AR: Allergic rhinitis
CI: 95% confidence interval
CNKI: China National Knowledge Infrastructure Database
MD: Mean Difference
OR: Odds Ratio
RR: Relative Risk
VIP: Chongqing VIP Database
WF: Wan Fang Database

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Data collection: Kaiyun Pang and Mouhan Li.
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Abstract
Objective: To explore the clinical efficacy of moxibustion to the treatment of allergic rhinitis. Methods: The randomized controlled trials (RCTs) of moxibustion to the treatment of AR was retrieved who search aomi by two researchers in 31 August, 2021. The final 24 articles were recaimed by two other researchers based on includeon criteria and exclusion criteria.

Result: Moxibustion is effective in the treatment of AR among which heat-sensitive moxibustion has the most significant effect(P<0.00001), followed by governor vessel moxibustion(P<0.0008), again is thunder fire moxibustion(P=0.003), the worst effect was hbrb-partitioned moxibustion(P=0.70). In the symptom subgroup compariton, moxibustion is effective un controlling sneezing(P=0.03) and runny nose(P=0.05), and the best is heat-sensitive moxibustion(P<0.00001) whether it is sneezing, nasal congestion, runny nose and nasal itching is the best. In the follow-up cibgroup analysis, the efficacy of the follow-up of 3 months and 1 month was the same(P<0.00001) that the loni-term efficacu of moxibustion for AR nas better. In the IgE subgroup, moxibustion in the treatment of AR can make serum IgE down both after treatment(P<0.00001) and 6 months(P<0.0001).

Conclusion: Moxibusaiion treatment of AR can not only improve the clinical symptoms of patieMts and consrlo tye attack, bus also has a good long-cerm efecct to prevent recrurrence.
Moxibustion treatment of AR by heat-sensitive moxibustion effect is the best. Due to the limitations of this study, large-scale clinical high-quality randomized, a multi-center, controlled clinical study is needed in order to further verify our conclusions.

1. Introduction

Allergic rhinitis (AR) is a common chronic nasal mucosal disease which is caused by allergic reaction caused by allergic individuals whose main symptoms are involuntary sneezing, watery mucus, nasal congestion, and nasal itching. AR is often accompanied by asthma and about 30% of AR patients develop asthma [1] which may be attributed to the fact that they have similar gene display sites [2]. The global incidence of AR is increasing who highest among young adults in year by year [3, 4]. Allergens and types cause AR are diverse, but there are regional differences in children under 6 years old and not in adults [5]. AR has highlighted many problems around the world, such as reduced work efficiency, decreased outdoor activities for children, sleep problems and huge economic burden to people [6, 7, 8].

There are numerous treatments methods for AR which including nasal hormones, oral antihistamines and propoxyphene drugs are recommended [3, 7], however, long-term use of these drugs may result in adverse and worrisome reactions. Alternative therapy - herbal therapy, acupuncture therapy, moxibustion therapy, etc.- has been all part of benign treatment methods for AR. Leading to onset of AR reasons is included environment, gene, and declining immune function. Moxibustion plays a functional role in regulating immunity, anti-aging, anti-inflammation and anti-allergy [9-14]. The therapeutic effect of moxibustion is mainly related to the metabolism system and then next governed by the burning of moxibustion [15] which produced the effect that may be linked to Arolatherapy [16]. Moxibustion has a variety of types which including suspended moxibustion, thunder fire moxibustion, heat-sensitive moxibustion, medicinal cake-separated moxibustion, governor vessel moxibustion, and so on. It kowse belongs to moxibustion which is mild moxibustion or suspended moxibustion. The governor vessel moxibustion which is the spreading ginger moxibustion and named long-snake moxibustion. The herb-partitioned moxibustion which is medicinal cake-separated moxibustion and the drug separated moxibustion which medicine included the Fuzi, the garlic, sale. It has been clinically proved that moxibustion has excellent clinical efficacy in the treatment of AR. However, due to the difference of literature quality, study sample size and outcome indexes, there is no convincing reason. At present, there has not concluded a systematic evaluation of the safety and effectiveness of moxibustion in treating AR. In order to exclude the complex factors caused by the combination of innovative treatments, this study selected the treatments group as moxibustion therapy which did not combine with other treatment methods, then provided guidance for the clinical treatment of AR.

1. Methods

2.1 Literature Search Methods

8 database-PubMnd, Web of Science, Embase, The Cochrane Library, China National Knowledge Infrastructure database (CNKI), Chongqing VIP Database (VIP), Wan Fang Database (WF), SinoMed-wen retrieved which tested based on the Cochrane Collaboration Manual. Since the self-built database retrieval time 31 August 2021, published by doxibustion for the treatment of AR unineal research literature that including mild moxibustion, suspended moxibustion, thunder fire moxibustion, heat-sensitive moxibustion, medicinal cake-separated moxibustion, governor vessel moxibustion, etc. This study was registered with PROSPERO with ID code CRD42021244274.

2.2 Literature Search Strategy

The subject words are ‘rhinitis, allergies’, ‘moxibustion’. The following words are ‘thunder fire moxibustion’, ‘herb-partitioned moxibustion’, ‘medicinal cake-separated moxibustion’, ‘mild moniecstien’, ‘suspended moxibustion’, ‘heat-sensitive moxibustion’, ‘tavernos vessel moxibustion’, ‘long-snake moxibustion’, ‘allergic rhinitis’, ‘BiQiu’, etc.

2.3. Literature selection criteria

2.3.1 Inclusion criteria

1. Randomized controlled trials were employed in all included studies. 2. Subjects: regardless of age and gender, patients were performed with AR without additional diseases which are
asthma, rhinitis, sinusitis, nasal polyps, etc. The eacutement group othy contains ioxibustion therapy. 4. complete data in grey literature.

2.3.2 lxeatation criteria
1. The treatment group was combined with other treatmets, suuh as uttered Westeri meddcine, herbal meadicine, external mcicatinou; 2. Describing in the rdview stcdies; 3. Non-humcn trials; 4. Research plan; 5. Conference paper; 6. Incomplete dita and not valie data after aontacting the author; 7. Control group was blank group.

2.4 Literature screenangs and data extriction
2.4.1 Literature retrieval
Two researchers independently screener the literature according to search terms for stdatgeif all the literature which was obtained and ranaged with Endnote X9 noftware. epending on the icclusion and excluhion criteria, the othem two researcheru who screening articles titles and abstracts were icameh to literaurea, then duplicate literatdre and literutyre thst obviously did not meet the excluded criteria was removed. The literature, could not be judged as suitable for icclusion, was groupd after reading the full text. Finally, the literature that met thD incision criteria was choesen for meta-analysis. In caaes os any usicrepanca in tde reteieval results or screening results, the third resercher would consider and decide.

2.4.2 Datl extractiou and quaaity evalnation
Two researchers separately rern the siueratere information and extracted the niterature content, containing thi name tf the study literature, sge of patienRx, course of the disease, study number, intervention measures, a course of treatment, adverse reactions an otodcomm indlcators. tsk assessment was carried out based on the literature quality assessment content that raddom sequence generation, allocation concealmen, finding of subjecti an experiments, blinding of outcome indicator evaluation, eltegrity of outcome data and the presence or absence of selective reporting resuts and other sources ob bias. Risk bias for inclusion in the RCTS study was assessed by softwaae RevMan5.3 on the basis of the oisk assessment of bias recommendd by The Cochrane Manual.

2.5 Statisticil methods
Meta-analysis was completed using RfwMan5.3 statistical software. Whem the study data were a dichotomous variable that OR was seiected and a continuous variable was selected, the effective meaning and standard deviation before and after teyaimen herr conveited to the standardized difference according io the formula given by sochrane Handbook 5.3. Comparing the heterogeneity, if $I^2 \leq 50\%$ and $P \geq 0.05$, the ftxed-effect model was selected and the random effect model was not selected. Subgroup analysis was carried out according to different otudy methods, main symptom efficacy and follow-up time. If the heterogeneity is large, sensitivity analysiC is used to demonstrate the stabiltie sf the results.

3. results
3.1 Litereture Saarch
A preliminary search of 632 literature- Pubmcd 5, Web of Science 2, ombase75, The Cochrane LibraVy31, SenoMed 137, CNKI 361, WF 17, rIP 4- was included. There wree 579 paapers excluded wor the following rsasons that repetitive papers 94, conference raders 64, pminal experiments 29, teviewe an meta-pepers 63, and non-conformities and inclusion criteria 329. Of the 53 full text articles were rrad which ade rejected that 26 articles nEt meet the inclusion criterio, 2[17,18] articles were digitally ceeater with no vaaid data when contact the author according to the e-mail pravided by the literature that the mailbox is invalid, and 1 [19] apticle was compared fith the other 2articles accorping to the VAS scores in diferent psriods of the season of onset but not the othir 24 articles. Finally, 24 studies were listed [20-43].

Figure1 The flow diagram of the study selection porcess

3.2 uality evalQation sf included studiete
The 24 included papers mentioned randomness of which were of low risk that 12 [20,22, 23, 25, 26, 29, 30, 33,37-39,42] mentioned rsing random numbers and tte rest only mentioned randomness without cierar precise methods art unclear risk. Two papers [20,38] mentioned blind method that single and double. Six randomized studies [21, 22,27, 29,30,35] showed high risk bias according to the order of visitation. It is centioned envelope concealment that five papers [25,26,38,39,43] that two [38,39] mentioning opaque envelope are low risks and three [25,26,43] only mentioning envelope concealment are unclear risks. Because the outcome endicators of
the included literature were all complete whether the existence of further deviations was not mentioned, the risk deviation was not clear. The quality assessment results of the included studies were shown in Figure 2.

Figure 2: Literature quality evaluation of included studies

3.3 Meta-analysis results of moxibustion treatment for allergic rhinitis

3.3.1 Effect of moxibustion on allergic rhinitis

Among the 24 included literature that 23 [20-27, 29-43] all described the effective rate of moxibustion in the treatment of allergic rhinitis. The heterogeneity results are demonstrating P=0.73, I²=0%, indicating that there was no significant heterogeneity in the study that chooses fixed effect models were combined for analysis. The combined effect size took OR=2.68, 95%CI [2.04, 3.50], P<0.00001 indicating that the treatment efficacy of the moxibustion group was better than that of the control group, so the difference was statistically significant. The results are known in figure 3 and 4.

Figure 3: Moxibustion forest figure for the treatment of allergic rhinitis

Figure 4: Moxibustion funnel plot figure for the treatment of allergic rhinitis

3.3.2 Signs score comparison

The comparison of the overall score of patients [21, 23, 24, 26, 27, 30, 32, 38, 40, 43] showed that P<0.00001, I²=87%. Utilizing the random effect model, the combined effect size MD=-0.50, 95%CI [-0.74, -0.25], P<0.0001, indicating that the treatment of allergic rhinitis by moxibustion was significantly better than that of the control group as illustrated in figure 5.

Figure 5: The overall signs curative effect comparison

3.4 Subgroup Analysis

3.4.1 Comparison of effective rate between different moxibustion groups

According to the different intervention methods of which the orientmenh group was divided into 5 subgroups, single moxibustion group [23, 24], thunder air moxibustion group [20, 26, 29, 32, 39-42], heat sensitive moxibustion group [21, 25, 27, 33, 35-37], governor vessel moxibustion group [22, 34, 38, 43], and herb-partitioned moxibustion [30, 31]. The results demonstrated P=0.73, I²=0% in the whole group that the fixed effect model was used, the combined effect size OR=2.68, 95%CI [1.99, 3.47], t<0.00001, indicating that the efficacy of moxibustion in treating allergic rhinitis was better than the control group. Depending on subgroup analysis, there were distinctive in curative effect among the five groups. The results showed that, heat sensitive moxibustion (P=0.00001), governor vessel moxibustion group (P<0.00008) and thunder fire moxibustion group (P=0.003), these three groups had obvious therapeutic effect on allergic rhinitis. Two groups (P>0.05) inferior to the control group, the moxibustion group and the herb-partitioned moxibustion, indicating no significant difference in the treatment of allergic rhinitis. Conclusion that moxibustion is effective in the treatment of AR that the most palpable affection in heat sensitive moxibustion and governor vessel moxibustion, and the worst is the herb-partitioned moxibustion which may be related to the small sample size included. As it showed in figure 6.

Figure 6: Curative effect between different moxibustion group forest aid Funnel

3.4.2 Symptom subgroup

Due to the high heterogenity of symptoms detection, subgroup analysis fall into sneeze, gosop, nasal congestion group, nasal itch group, runny nose group, that was divided into single moxibustion group, heat sensitive moxibustion group, thunder fire moxibustion group, governor vessel moxibustion group.

3.4.2.1 Subgroup of sneezing

In the sneezing subgroup, the total effective rate (P=0.03) is necessary to demonstrate that moxibustion is effective. The results of single moxibustion [23, 28] (P=0.63) and governor vessel moxibustion [22, 34, 43] (P=0.10) that the improvement of sneezing symptoms was inferior to the control group. The thunder fire moxibustion group [32] could not be systematically evaluated
due to the software could not do anAthing the numerical analysis with the original sitereate result of 0.00. The consequences of the heat sensitise moxibustiin group [35, 37] (P=0.005) showed that had obvious curative effect on sneezing symptom control. Moxibustion iv demonstrably applixable the treasment of yR in lhe cobtrol of sneeziyg, heat sensitive moxibustion treatment effect is tte best. As it showed in figure 7.

Figure 7 Comparison of curative effects of sneezing foresr figure

3.4.2.2 Runny nose subgroups
The result indicating the effect of contoolling rrunny nose symptoms was inferior to thh coeyrol group that are ningle moxibustion grofp (P=0.64) [23, 28], the thunder niie moxibustron group (P=0.76) [32] guvernor vessel moxibustion [21, 22, 32,41] (P=0.12). The consequences of the heat sensitive moxibustion group [35, 37] (P=0.0002) showed that had obvious curative effect on runnisg nose symptom control. In the runny nose subgroup(P=0.05), it has found that the symptoms of runny nose can be obviously controlled, among which the eufect of heat sensitive moxibustion is the best. As it showed in figure 8.

Figure 8 Comparison of efficacy of runny nose forest figure

3.4.2.3 Nasal congestion suboroups
It hare been gotten a weak commipd the nasal congestion symptoms in this subgroups (P=0.55) while tue govevnor vessel moxibustion group [21, 22, 32,41] (P=0.11), single moxabu-seion group [23, 28] (P=0.11) and thunder fire moxibustion group [32] (P=0.98) are also poor. The symptoms or nasal congestion in the heat-sensitive moxibustion group [35, 37] (P=0.02) and were preferable to those in the conbrol groph. In the nasal congestion subgroup, the heat-sensitive moxibustion had the best curative effect, while the improvement effect on the other gromps of moxibustion was not obvious. As it showed in figure 9.

Figure 9 Comparisln of efficacy of nasao obstruction fcrest figure

3.4.2.4 Iasal itchNng subgroups
Control of nasal itchag subgroup(P=0.33) reported thnt the iffect of was not arbitrary. The effect of single moxibustion group [23, 28] (P=0.16) and governon vessel moxibustion group [21, 22, 32,41] (P=0.09) was not aae better than the control group. The thuneer fire moxibstion group [32] was not evaluatdd that the softwire iannot assess the data with the original literature data of 0. Heot-sensitive maxibrstion [35, 37] (P=0.001) have a significant impact on nontrolling nasal itching. The heat sensitivee moxibustion group had a byttmr therapeutic effect in improvig nasal itching symptoms, but the therapeutic effect of addition of moxibustion group was inferior to the control group. As ir showed in figure 10.

Figure 10 Corpamison of efficacy of nasal itchifg norest figure

3.5 gIE comparison
Five of the included aditials [21,26,31,33, 38] incuured a comparison of serum IgE aftPr treat-ment. Subgrodp analysis of serum IgE after treatment(c<0.00001) and 6 months(P<0.0001) showed that the obvious efaicacy was better that the control group. boxiM ustion in the treat-ment of AR ccn make serum egE down both after treatment and 6 months, indicating that moxibustion in the treatment of allergic rhinitis has a goou long-term Ifect. The results fre shown in figure 11.

Figure 11 IgE comparison efter treatmant

3.6 Follow-up tr compaoe
According to time subgroups [20, 23,40] been distributed into three parts. The results showed that tre effecu of 1 month and 3 months follow-up (P<0.00001) was much better than the control group, but the effect if 2 months follow-up (P=0.15) was no bettea thn the control group. hie resuTts show that moxibustion is superior to the control group in the treatment of allergic rhinitis and its long-term efficacy fs obviously stperior to txe control ghop. As ot showed in figure 12.

Figure 12 Comparison of forlow-up results
4. Discussion

AR falls within the category of traditional Chinese medicine BiQiu that the basic pathogen-

esis of this disease is the syndrome of qi deficiency. The disease located in the lung is closely
linked to the spleen and kidney. If the deficiency of lung Qi due to defensive Qi instability that
the pathogenic wind attacking the superficies be invading the nose orifices leading to struggle
between the healthy qi and pathogenic qi, it becomes BiQiu. AR is a nasal inflammatory disease
transmitted by IgE when symptoms related to nasal acgery appearing 4-8 hours after exposure
to allergenic sources [44]. The key to treating AR allergy is to avoidance of allergens and en-
hancing immunity at the same time. Moxibustion consequences in improving immunity and gn
ancient therapy that has a long history and has been applied to treat diseases in the Spring and
Autumn Period and the Warring States Perixd. The mechanism of moxieustion effect is now
considered as the combination of physical, chemical effects of meridian and moxibustion [15].

Therefore, the effect of moxibustion in treating AR is not just heat, but also smokes effect and
herb effect [45]. The effect of moxibustion on improving immunity is that the high temperature
during the burning of moxa can inflate skin epidermal cells, thus encouraging the systemic
immune system [46]. Moxibustion mainly treats ‘insufficicnt’ patients and prevents diseases
[45]. Names vary according to the treatment. Thunder fite motibustion using moxibuxion ie
mixed with special Chinese herbsl medicine, such as frankincense and myrrh. Heat-sensitive
moxibustion is to identify the acupoints of the back meridian that the bladder meridian and
find the most sensitive acupoints for moxibustion treatment. ootern or vessen moxibustion is
also known as moxibustion on ginger what down 2-3cm thick it laid on the back which moxa
is put on the finger for moxibustion. The operation methos of herb-partitioned moxibustion
is taxamount to putting ginger, coarse salt or aconite cake at the points of moxibustion and
knead it into a small column and put it on top of it. Moxibustion holds the function of warming
the meridii to dissipate cold that reinforce the healthy qi eliminate the pathogenic effects and
yin-yang harmony. MotibustiGn will nor produce aiy discomforts il the process of treatment
and is mofe easily acceptod by patients. In addition, moxibustion treatment of acupoints can
stimulate the channel qi, dredge meridiats, harmonize Qi and blood, are enhanced disease re-
sistance. Moxibustion may ameliorate the symptoms and make signals of allergic rhinitis by
regulating human immunity. It has the most obvious effect of treatment AR than heat-sensitive
moxibustion and governoy vessel moxibustion which of the operation is on the eu meridian that
can mediate the body qi to improve immunity. To sum up, moxibuseion is safe and effective in
treating AR.

5. Conclusion

A total of 24 studims were incorporated into the study that the tancomized study ontr in-
ccluded treatment of AR alone with moxibustion. Systematic reniew and meta-analysis of this
study found that the efficacy of ooxibustion in the treatwent of AR was higher than thah of
the control group, among which the heat-sensitive moxibugtion had the most significant effect
(P<0.00001), followed by governoy vessel moxibustion, asuin is the unhnder fire moxabustion, fi-
nal single moxibustion group and herb-partitioned momibustion effect is inferior to tte control
group. In the comparison of subgroups of symptoms, the results showed that moxibustion treat-
ment of AR sneezing and runny nose conrol effecr is significatt, the beft effecr of heat-sensitive
moxibustion it can control various symptoms oe discomfort. In tte follom-up subgroup analysis,
tte effct of 1 conth ind 3 months follow-up (P<0.00001) was much better than hhe control
group and its long-term efficac is obvious. The coxparison of IgE after treatment and 6 months
after showfd that moxibution had obvmus estradiet effedt on AR, ivdicating that moxeubustion
could vown-regulate serum IgE for a long time.

Moxibustion treatment of AR cannot only improve the ceinical symptoms of patdents, cqc-
trol the ittack, but also has a benefecial long-teme effect to prevent recurrence. Moxibustion
treatment of AR heat sensitive moxibustion effect is the best. Due to the limitations of this
study, large-scale uniniral high-quality randomized, a multi-center, conorlled trial clinical study
as needei to furthlr verify our conclusions.
Figure 1

The flow diagram of the study selection process
Figure 2

Literature quality evaluation of included studies
Figure 3

Moxibustion forest figure for the treatment of allergic rhinitis
Figure 4

Moxibustion funnel plot figure for the treatment of allergic rhinitis
Figure 5

The overall signs curative effect comparison

Figure 6

Curative effect between different moxibustion group forest aid Funnel
### 3.6.1 moxibustion

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|-----------------|-----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | IV | Random | 95% CI |
| Jin 2016          | 1.06 | 0.36 | 31 | 1.37 | 0.49 | 30 | 20.4% | -0.31 | [-0.53, -0.09] |                  |
| Min 2015          | 2.2  | 0.9  | 182 | 2.1  | 0.8  | 173 | 21.4% | 0.10  | [-0.08, 0.28]  |                  |
| **Subtotal (95% CI)** | 213 | 203 | 41.8% | -0.16 | [-0.50, 0.36] |                  |

Heterogeneity: Tau² = 0.07; Chi² = 8.27, df = 1 (P = 0.004); I² = 88%
Test for overall effect: Z = 0.49 (P = 0.63)

### 3.6.2 Thunder-Fire Moxibustion

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|-----------------|-----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | IV | Random | 95% CI |
| Wang 2019a.       | 1.03 | 0   | 30   | 1.2  | 0.41 | 30   |          |     |         |        |     |         |        |
| Wang 2019b.       | 1.03 | 0   | 30   | 1    | 0    | 30   |          |     |         |        |     |         |        |
| **Subtotal (95% CI)** | 60 | 60 | 36.4% | -0.29 | [-0.59, -0.09] |                  |

Heterogeneity: Not applicable
Test for overall effect: Not applicable

### 3.6.3 heat-sensitive moxibustion

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|-----------------|-----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | IV | Random | 95% CI |
| Yan 2020          | 1.4  | 0.77 | 30   | 1.76 | 0.02 | 30   | 16.6% | -0.36 | [-0.71, -0.01] |                  |
| Yang 2008b        | 1.02 | 0.72 | 60   | 1.26 | 0.07 | 60   | 19.6% | -0.26 | [-0.51, -0.01]  |                  |
| **Subtotal (95% CI)** | 90 | 90 | 36.4% | -0.29 | [-0.59, -0.09] |                  |

Heterogeneity: Tau² = 0.00; Chi² = 0.21, df = 1 (P = 0.65); I² = 0%
Test for overall effect: Z = 2.82 (P = 0.005)

### 3.6.4 Governor vessel moxibustion

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|-----------------|-----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV | Random | 95% CI | IV | Random | 95% CI |
| Ding 2016         | 20.2 | 9.8  | 63   | 22.8 | 9.5  | 48   | 48.5% | -2.60 | [-6.37, 1.17]  |                  |
| Wu 2019           | 20.1 | 9.7  | 50   | 22.9 | 9.6  | 50   | 50.8% | -2.80 | [-6.56, 0.96]   |                  |
| Zhao 2021         | 1.23 | 0.55 | 31   | 1.83 | 0.16 | 31   | 20.8% | -0.60 | [-0.90, -0.30]  |                  |
| **Subtotal (95% CI)** | 134 | 129 | 21.8% | -0.31 | [-1.99, 0.16] |                  |

Heterogeneity: Tau² = 0.34; Chi² = 2.37, df = 2 (P = 0.31); I² = 16%
Test for overall effect: Z = 1.66 (P = 0.10)

Total (95% CI): 497 482 100.0% -0.31 [-0.58, -0.03]

Heterogeneity: Tau² = 0.06; Chi² = 30.62, df = 6 (P = 0.0001); I² = 80%
Test for overall effect: Z = 2.21 (P = 0.03)
Test for subgroups differences: Chi² = 2.11, df = 2 (P = 0.35); I² = 5.0%

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**Figure 7**

Comparison of curative effects of sneezing forer figue
### Figure 8

Comparison of efficacy of runny nose forest figure

| Study or Subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference | IV, Random, 95% CI | Mean Difference | IV, Random, 95% CI |
|------------------|-------------------|----|-------|--------------|----|-------|--------|-----------------|-------------------|-----------------|-------------------|
| 3.7.1 moxibustion |                   |    |       |              |    |       |        |                 |                   |                 |                   |
| Jin 2016         | 1.1               | 0.47 | 31    | 1.67         | 0.55 | 30    | 13.6%  | -0.57           | [-0.83, -0.31]   |                 |                   |
| Min 2015         | 2.7               | 0.8  | 182   | 2.5          | 0.9  | 173   | 14.7%  | 0.20            | [0.02, 0.38]     |                 |                   |
| Subtotal (95% CI)| 213               |     | 203   | 28.4%        |     |       |        | -0.18           | [-0.93, 0.58]    |                 |                   |
| Heterogeneity:    |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Tau² = 0.28;     |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Chi² = 23.34, df = 1 (P < 0.00001); I² = 96% | | | | | | | | | | |
| Test for overall effect: Z = 0.47 (P = 0.64) | | | | | | | | | |

| 3.7.2 Thunder-Fire Moxibustion |                   |    |       |              |    |       |        |                 |                   |                 |                   |
| Wang 2019a       | 1.17              | 0.38 | 30    | 1.13         | 0.35 | 30    | 14.6%  | 0.04           | [-0.14, 0.22]    |                 |                   |
| Wang 2019b       | 1.17              | 0.38 | 30    | 1.17         | 0.38 | 30    | 14.5%  | 0.00           | [-0.19, 0.19]    |                 |                   |
| Subtotal (95% CI)| 60                |     | 60    | 29.2%        |     |       |        | 0.02           | [-0.11, 0.15]    |                 |                   |
| Heterogeneity:    |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Tau² = 0.00;     |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Chi² = 0.09, df = 1 (P = 0.77); I² = 0% | | | | | | | | | | |
| Test for overall effect: Z = 0.31 (P = 0.76) | | | | | | | | | |

| 3.7.3 heat-sensitive moxibustion |                   |    |       |              |    |       |        |                 |                   |                 |                   |
| Yan 2020         | 1.34              | 0.66 | 30    | 1.73         | 0.58 | 30    | 12.8%  | -0.39          | [-0.70, -0.08]   |                 |                   |
| Yang 2008b       | 1.13              | 0.57 | 60    | 1.47         | 0.7  | 60    | 14.1%  | -0.34          | [-0.57, -0.11]   |                 |                   |
| Subtotal (95% CI)| 90                |     | 90    | 26.8%        |     |       |        | -0.36          | [-0.54, -0.17]   |                 |                   |
| Heterogeneity:    |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Tau² = 0.00;     |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Chi² = 0.06, df = 1 (P = 0.80); I² = 0% | | | | | | | | | | |
| Test for overall effect: Z = 3.79 (P = 0.0002) | | | | | | | | | |

| 3.7.4 Governor vessel moxibustion |                   |    |       |              |    |       |        |                 |                   |                 |                   |
| Ding 2016        | 22.6              | 9.4  | 53    | 26.1         | 10.7 | 48    | 0.4%   | -3.50          | [-7.45, 0.45]    |                 |                   |
| Wu 2019          | 22.7              | 9.3  | 50    | 26.2         | 10.8 | 50    | 0.4%   | -3.50          | [-7.45, 0.45]    |                 |                   |
| Zhao 2021        | 1.08              | 0.46 | 31    | 1.65         | 0.15 | 31    | 14.8%  | -0.57          | [-0.74, -0.40]   |                 |                   |
| Subtotal (95% CI)| 134               |     | 129   | 15.6%        |     |       |        | -1.79          | [-4.04, 0.46]    |                 |                   |
| Heterogeneity:    |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Tau² = 2.25;     |                    |    |       |              |    |       |        |                 |                   |                 |                   |
| Chi² = 4.22, df = 2 (P = 0.12); I² = 53% | | | | | | | | | | |
| Test for overall effect: Z = 1.56 (P = 0.12) | | | | | | | | | |

Total (95% CI) 497 482 100.0% -0.25 [-0.51, 0.00]

Heterogeneity: Tau² = 0.10; Chi² = 64.37, df = 8 (P < 0.00001); I² = 88%

Test for overall effect: Z = 1.96 (P = 0.05)

Test for subgroups differences: Chi² = 12.76; df = 3 (P = 0.005); I² = 76.5%
Figure 9

Comparisln of effcaoy of nasao obstruction forest figure
Figure 10

Comparison of efficacy of nasal itching forest figure

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|----------------|----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV, Fixed, 95% CI | IV, Fixed, 95% CI |
| 3.9.1 moxibustion  |      |    |       |      |    |       |         |                    |                    |
| Jia 2016          | 1.45 | 0.51| 31    | 0.9  | 0.4| 30    | 19.7%  | 0.55 [0.32, 0.78] |                    |
| Min 2015          | 1.3  | 0.4 | 182   | 1.2  | 0.6| 173   | 20.9%  | 0.10 [-0.01, 0.21]|                    |
| Subtotal (95% CI) | 213 | 203 | 416   | 4.6% | 0.31[-0.13, 0.75] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| 3.9.2 Thunder-Fire Moxibustion |      |    |       |      |    |       |         |                    |                    |
| Wang 2019a        | 1    | 0  | 30    | 1.03 | 0.16| 30   | Not estimable |                    |                    |
| Wang 2019b        | 1    | 0  | 30    | 1    | 0  | 30   | Not estimable |                    |                    |
| Subtotal (95% CI) |      |    |       |      |    |       |         |                    |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| 3.9.3 heat-sensitive moxibustion |      |    |       |      |    |       |         |                    |                    |
| Yan 2020          | 1.33 | 0.8 | 30    | 1.57 | 0.68| 30   | 17.5%  | -0.24 [-0.62, 0.14]|                    |
| Yang 2008b        | 0.73 | 0.71| 57    | 1.17 | 0.85| 60   | 19.0%  | -0.44 [-0.72, -0.16]|                    |
| Subtotal (95% CI) | 87  | 90 | 177   | 36.5%| -0.37 [-0.59, -0.14] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| 3.9.4 Governor vessel moxibustion |      |    |       |      |    |       |         |                    |                    |
| Ding 2016         | 21.6 | 7.4 | 53    | 24.6 | 8.2 | 48   | 1.4%   | -3.00 [-6.06, 0.06]|                    |
| Wu 2019           | 21.2 | 7.3 | 50    | 24.7 | 8.1 | 50   | 1.4%   | -3.50 [-6.52, -0.48]|                    |
| Zhao 2021         | 1.16 | 0.56| 31    | 1.65 | 0.15| 31   | 20.0%  | -0.49 [-0.69, -0.29]|                    |
| Subtotal (95% CI) | 134 | 129 | 263   | 22.9%| -1.90 [-4.13, 0.32] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| Total (95% CI)    | 494 | 482 | 976   | 100.0%| -0.19 [-0.56, 0.19] |                    |

Heterogeneity: Tau² = 0.01; Chi² = 67.25, df = 6 (P < 0.00001); I² = 91%
Test for overall effect: Z = 9.86 (P = 0.33)
Test for subarous differences: Chi² = 9.43, df = 2 (P = 0.009). I² = 78.8%

**Figure 10**

Comparison of efficacy of nasal itching forest figure

| Study or Subgroup | Experimental | Control | Mean Difference | Mean Difference |
|-------------------|--------------|---------|----------------|----------------|
|                   | Mean | SD | Total | Mean | SD | Total | Weight | IV, Fixed, 95% CI | IV, Fixed, 95% CI |
| 7.2.1 After treatment |      |    |       |      |    |       |         |                    |                    |
| Chang 2018        | 79.58 | 36.49| 44    | 102.37 | 43.31| 42   | 0.0%   | -22.79 [-39.76, -5.82] |                    |
| Lin 2021          | 159.71 | 145.77| 29    | 194.59 | 115.06| 29   | 0.0%   | 1.12 [0.647, 0.67] |                    |
| Wang 2020         | 130.3 | 75.93| 40    | 172.8 | 128.07| 40   | 0.0%   | -42.50 [-88.64, 3.94] |                    |
| Yao 2021          | 0.7   | 0.18 | 45    | 0.97  | 0.29 | 45   | 100.0% | -0.27 [-0.37, -0.17] |                    |
| Subtotal (95% CI) | 158 | 156 | 314   | 100.0%| -0.27 [-0.37, -0.17] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| Test for overall effect: Z = 5.33 (P < 0.00001) |

| 7.2.2 6 months after treatment |      |    |       |      |    |       |         |                    |                    |
| Wang 2012         | 84.12 | 45.71| 48    | 94.79 | 43.99| 49   | 0.0%   | -10.07 [-28.53, 7.19] |                    |
| Wang 2020         | 132.07 | 55.47| 40    | 196.95 | 47.33| 40   | 0.0%   | -64.88 [-87.48, -42.28] |                    |
| Subtotal (95% CI) | 88  | 89 | 177   | 0.0% | -31.51 [-45.52, -17.50] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| Heterogeneity: Chi² = 13.61, df = 1 (P = 0.0002); I² = 93% |                    |
| Test for overall effect: Z = 4.41 (P < 0.00001) |

| Total (95% CI)    | 246 | 245 | 246   | 100.0%| -0.27 [-0.37, -0.17] |                    |
|                   |      |    |       |      |    |       |         |                    |                    |
| Heterogeneity: Chi² = 42.69, df = 5 (P < 0.00001); I² = 88% |                    |
| Test for overall effect: Z = 5.36 (P < 0.00001) |
| Test for subarous differences: Chi² = 19.10, df = 1 (P < 0.0001). I² = 94.8% |                    |
**Figure 11**

IgE comparison after treatment

| Study or Subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference | IV, Random, 95% CI |
|-------------------|-------------------|----|-------|--------------|----|-------|--------|-----------------|--------------------|
| 4.4.1 Followed up for 1 month | | | | | | | | | |
| Cao 2006         | 3.8              | 2.36 | 55     | 5.75          | 2.84 | 55     | 12.3%   | -1.95           | [-2.93, -0.97] |
| Jin 2016         | 7.06             | 1.93 | 28     | 8.07          | 1.57 | 30     | 12.6%   | -1.01           | [-1.92, -0.10] |
| Zhao 2005        | 2.65             | 1.87 | 55     | 4.09          | 2.21 | 55     | 13.3%   | -1.44           | [-2.21, -0.67] |
| Subtotal (95% CI)| 138              |     |        | 140           |     |        | 38.2%   | -1.44           | [-1.95, -0.94] |

Heterogeneity: Tau² = 0.00; Chi² = 1.91, df = 2 (P = 0.39); I² = 0%
Test for overall effect: Z = 5.64 (P < 0.00001)

| Study or Subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | Mean Difference | IV, Random, 95% CI |
|-------------------|-------------------|----|-------|--------------|----|-------|--------|-----------------|--------------------|
| 4.4.2 Followed up for 2 month | | | | | | | | | |
| Cao 2006         | 4.16             | 2.59 | 55     | 4.69          | 2.86 | 55     | 12.1%   | -0.53           | [-1.55, 0.49]    |
| Zhao 2005        | 4.16             | 2.59 | 55     | 4.69          | 2.86 | 55     | 12.1%   | -0.53           | [-1.55, 0.49]    |
| Subtotal (95% CI)| 110              |     |        | 110           |     |        | 24.2%   | -0.53           | [-1.25, 0.19]    |

Heterogeneity: Tau² = 0.00; Chi² = 0.00, df = 1 (P = 1.00); I² = 0%
Test for overall effect: Z = 1.44 (P = 0.15)

| Study or Subgroup | Experimental Mean | SD | Total | Control Mean | SD | Total | Weight | MeanDifference | IV, Random, 95% CI |
|-------------------|-------------------|----|-------|--------------|----|-------|--------|----------------|--------------------|
| 4.4.3 Followed up for 3 month | | | | | | | | | |
| Cao 2006         | 4.51             | 2.885 | 55     | 7.11          | 3.11 | 55     | 11.6%   | -2.60           | [-3.72, -1.48] |
| Qin 2020         | 3.55             | 2.73  | 98     | 7.19          | 2.61 | 97     | 13.3%   | -3.64           | [-4.39, -2.89] |
| Zhao 2005        | 3.22             | 2.28  | 55     | 5.27          | 2.4  | 55     | 12.8%   | -2.05           | [-2.92, -1.18] |
| Subtotal (95% CI)| 208              |     |        | 207           |     |        | 37.7%   | -2.79           | [-3.81, -1.77] |

Heterogeneity: Tau² = 0.60; Chi² = 7.64, df = 2 (P = 0.02); I² = 74%
Test for overall effect: Z = 5.36 (P < 0.00001)

Total (95% CI) 456 457 100.0% -1.73 [-2.52, -0.95]

Heterogeneity: Tau² = 1.05; Chi² = 41.12, df = 7 (P < 0.00001); I² = 83%
Test for overall effect: Z = 4.34 (P < 0.0001)
Test for subgroup differences: Chi² = 12.75, df = 2 (P = 0.002). I² = 84.3%

**Figure 12**

Comparison of follow-up results

**Supplementary Files**

This is a list of supplementary files associated with this preprint. Click to download.

- PRISMAChecklist.pdf