



Review article

Research progress of traditional Chinese medicine in the treatment of allergic rhinitis

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ABSTRACT

Allergic rhinitis, one of the common diseases in otolaryngology, has shown an increasing incidence under the influence of various geographical, cultural and economic factors, making it a common and serious global public health problem. Modern medicine uses medication as the primary therapy for allergic rhinitis, but poor symptom control and easy relapse are the disadvantages of this treatment. However, Traditional Chinese medicine, with its long history, has treated allergic rhinitis by symptomatic treatment according to pattern differentiation with its unique insights and methods, which are effective and safe in numerous clinical studies. Therefore, this paper describes TCM decoction, acupuncture, moxibustion, acupoint application, catgut-embedding therapy and ear acupuncture in the treatment of AR. This study aims to provide more personalized and precise treatment for allergic rhinitis patients by investigating the mechanism of action, clinical research and development of traditional Chinese medicine treatments.

1. Introduction

Allergic rhinitis (AR), a common clinical allergic disease, is usually accompanied by chronic inflammatory cell infiltrates in the nasal mucosa [1]. The main symptoms of this disease include sneezing, clear nasal discharge, nasal congestion and nasal itching, which can badly affect patients' quality of sleep, work and daily life [2,3]. According to relevant epidemiological data, approximately 10–40% of the world's population is affected by AR [4,5]. In China, the morbidity of AR has reached over 10% and has become increasingly prevalent in recent years, making it a global health concern [6]. AR, a common and multiple autoimmune disease, has been the subject of increasing clinical interest and concern. Presently, the role of immune factors in the onset and development of AR is widely studied [7,8]. Both geneogenous immune cells and adaptive immune cells have been reported to be involved in the pathophysiological mechanisms of AR [9–11].

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Table 1
TCM syndrome classification in AR.

Chinese Herbal Formula	Composition	Number of Cases	Syndrome Type	Diagnostic Criteria	Therapeutic Effect	Inclusion Period	site	References
Ximin Jian	Ephedra, Cinnamon Twig, White Peony Root, Prepared Aconite Root, Asarum, Bupleurum, Magnolia Flower, Roasted Licorice	50	Lung and Kidney Deficiency-Cold Syndrome	Primary symptoms: Nasal itch, frequent sneezing or sudden onset, continuous clear nasal discharge, nasal congestion; Secondary symptoms: Limbs not warm, pale complexion, aversion to cold or preference for warmth, curled up posture; clear and long urine or loose stools; pale tongue with white and moist or slippery coating, or swollen and tender tongue. Diagnosis is made if there are two or more primary and secondary symptoms.	Regulates immune balance; significantly improves nasal and systemic symptoms	May 2017 to October 2018	Beijing Traditional Chinese Medicine Hospital, Capital Medical University	[21]
Qi-Tonifying	Astragalus, Codonopsis, Dried Ginger, Cinnamon Twig, Ephedra, Schisandra, Earthworm, Magnolia Flower, Licorice, etc.	388	Lung and Spleen Deficiency-Cold Syndrome	Symptoms include episodic nasal itch, continuous sneezing, clear nasal discharge, nasal congestion, enlarged turbinates, pale nasal mucosa. May also have aversion to cold, reduced appetite, loose stools, fatigue in limbs. Tongue is pale red.	Significantly improves symptoms such as nasal itch, sneezing, nasal discharge, nasal congestion, and swollen turbinates	June 2009 to September 2011	Affiliated hospitals of Nanjing University of Chinese Medicine including the Second and Third Affiliated Hospitals	[22]
Jianpi Tongqiao Decoction	Astragalus, Codonopsis, Licorice, Xanthium, Magnolia Flower, Asarum, Schizonepeta, Platycodon, Pumice, Cimicifuga, Bupleurum	90	Spleen Qi Deficiency Syndrome	Spleen Qi deficiency leading to lack of nourishment for the nasal passages, with wind-cold taking advantage due to deficiency, manifesting as nasal itch and frequent sneezing; Spleen Qi deficiency causing dampness not to be transported, leading to accumulation in the nasal passages, hence nasal congestion and clear discharge; Pale tongue, swollen tongue body, tooth marks on the sides.	Regulates and enhances immunity	January 2016 to December 2017	First Affiliated Hospital of Guangxi University of Traditional Chinese Medicine	[23]
Yifei Tiaoxue Decoction and Qingre Tongyang Decoction	Yifei Tiaoxue Decoction (Astragalus, Atractylodes, Saposhnikovia, Roasted Ephedra, Cinnamon Twig, White Peony Root, Asarum, Dark Plum, Cicada Slough, Tribulus, Salvia, Nelumbo, Angelica, Chuanxiong, Roasted Earthworm, Licorice); Qingre Tongyang Decoction (Pueraria Root, Scutellaria, Mulberry Leaf, Cinnamon Twig, White Peony Root, Asarum, Rehmannia, Salvia, Dried Lotus, Dark Plum, Angelica, Chuanxiong, Roasted Earthworm, Licorice).	90	Yang Qi Deficiency Syndrome and Yang Qi Stagnation Syndrome	Yang Qi Deficiency: Nasal itch, sneezing, clear watery nasal discharge, nasal congestion; aversion to wind, spontaneous sweating, shortness of breath, unwillingness to talk, pale tongue, thin white coating. Yang Qi Stagnation: Nasal itch, sneezing, thick nasal discharge, nasal congestion, dryness inside the nose, often triggered in hot and stuffy weather; dryness of mouth and nose, itchy throat, irritability, thirst, red tongue, white or yellow coating.	Reduces swelling of nasal mucosa, improves nasal ventilation, promotes recovery of nasal mucosal function	June 2011 to October 2012	Affiliated Hospital of Shandong University of TCM	[24]

Clinically, western medicine values avoiding contact with allergens, boosting immunity and combining with medications such as hormones, receptor antagonists and antihistamines to treat AR [12–14]. Clinically, western medicine values avoiding contact with allergens, boosting immunity and combining with medications such as hormones, receptor antagonists and antihistamines to treat AR. However, these treatments have significant short-term effects, but their efficacy is often not long-lasting, and once stopped, they are prone to recurrence. In addition, hormone and other drugs are highly dependent, and antihistamines have side effects such as drowsiness, which are not suitable for long-term use [15]. Therefore, AR and its root cause cannot be fully cured and treated [16,17]. As a result, many clinicians are actively exploring the TCM diagnosis and treatment regimen for AR [18]. Clinically, TCM methods such as decoction and acupuncture have been widely used to treat AR [19,20], and have achieved significant curative effects and a good safety profile. These TCM methods are practical treatment strategies that are of great importance for the prevention and treatment of AR and represent a significant breakthrough in treating AR. This paper reviews the research progress of TCM in the treatment of AR in recent years, providing a basis for clinical traditional Chinese medicine treatment of AR.

2. TCM decoctions

In the research field of traditional Chinese medicine (TCM), the pathogenesis of AR can be divided into the dysfunction of zang-fu organs, including deficiency of lung qi, deficiency of spleen qi, or wind-cold stagnation and blockage due to the insufficiency of kidney yang (Table 1). And deficiency and impairment of the lung, spleen and kidney will cause the failures of upward and outward diffusion of lung qi, ascending of the spleen qi and warming of the kidney qi, especially the insufficiency of the Wei-defensive qi, which leads to the hypofunction of healthy qi in defending against pathogens, coupled with pathogenic factors such as wind-cold or damp-heat invading the exterior, resulting in the occurrence of AR. Accordingly, TCM treats both symptoms and root causes.

YAN et al. [21] randomly divided 100 confirmed AR patients (perennial) with deficiency-cold of lung and kidney into treatment and control groups. The treatment group was given Ximin decoction, which is composed of *Herba Ephedrae* 5g, *Ramulus Cinnamomi* 10g, *Radix Paeoniae Alba* 10g, *Radix Aconiti Lateralis Praeparata* 10g, *Radix et Rhizoma Asari* 3g, *Radix Bupleuri* 9g, *Flos Magnoliae* 10g and *Radix et Rhizoma Glycyrrhizae Praeparata cum Melle* 10g. The control group was treated with Flixonase nasal spray and oral administration of loratadine tablets. After four weeks of treatment, the results showed that Ximin decoction not only improved the body's immune balance, but also relieved nasal and systemic symptoms of allergic rhinitis with deficiency-cold of lung and kidney. YAN et al. [22] evaluated the clinical efficacy of Yiqi Wenyang Fang on AR patients with deficiency-cold of lung and spleen using cetirizine and budesonide nasal sprays as a control. This study concluded that Yiqi Wenyang Fang (Chinese medicinal granules, composed of raw *Radix Astragali*, *Radix Codonopsis*, *Rhizoma Zingiberis*, *Ramulus Cinnamomi*, *Herba Ephedrae*, *Fructus Schisandrae Chinensis*, *Pheretima*, *Flos Magnoliae* and *Radix et Rhizoma Glycyrrhizae*), whether from the short or long term effect, is favourably effective in the treatment of AR patients with deficiency-cold of lung and spleen, which deserves further study. GUI et al. [23] observed the clinical efficacy of Jianpi Tongqiao decoction (JTD) in treating AR with deficiency of spleen qi by randomly dividing 90 patients into Western medicine group (external use of azelastine hydrochloride nasal spray), Chinese medicine group (oral use of JTD), and combined group (external use of azelastine hydrochloride nasal spray + oral use of JTD). The results suggested that JTD can reinforce the healthy qi to strengthen the body and enhance immunity and show significant clinical efficacy in treating perennial AR with spleen

Table 2
Distribution of acupoints corresponding to TCM treatment types for AR.

Treatment Type	Acupoints	Efficacy Rate	Function	References
Acupuncture Moxibustion	Tongtian, Shenzhu	96.97%	Good clinical effectiveness, reduces recurrence rate	[28]
	Feishu, Pishu, Shenshu	91.7%	Improves circulation, enhances immune function	[29]
	Yintang, Yingxiang, Shangxing, Tongtian, Feishu, Hegu, Zusanli, Shenque, etc.	83.33%	Enhances quality of life, particularly through improvements in sleep and nasal symptoms	[30]
	Shangxing, Yintang, Yingxiang, Lieque, Hegu	93.7%	Increases cure rate, improves symptoms	[31]
	Yingxiang, Yintang, Baihui, Hegu, Guanyuan, Zusanli, Taichong, Dazhui, Fengchi, etc.	82%	Significantly improves TCM syndrome differentiation, clinical symptoms, physical signs, and VAS scores	[32]
	Yintang, Shangyingxiang, Fengmen, Zusanli, Pishu, Weishu	96.55%	Improves patients' symptoms and signs	[33]
Acupoint Application	Qihai, Fengmen, Feishu, Hegu	96.77%	Enhances immune function, strengthens constitution	[34]
	Dazhui, Feishu, Pishu, Shenshu	88.3%	Coordinates organ functions, improves constitution, adjusts immune function, improves blood circulation, eliminates abnormal nasal mucosal inflammatory reactions	[35]
	Yintang, Fengmen, Feishu, Gaomangshu	96.7%	Opens nasal passages, regulates Qi and blood	[36]
	Dazhui, Fengmen	84.94%	Enhances immune function, strengthens disease prevention and resistance	[37]
Acupoint Catgut Embedding	Yintang, Dazhui, Fengmen	90%	Stable efficacy, safe and reliable, no toxic side effects	[38]
	Dazhui, Fengchi, Feishu, Zhiyang, Zhongwan, Qihai, Dachangshu, Daheng	92.31%	Effectively improves related symptoms, reduces recurrence rate	[39]
	Dazhui, Fengchi, Feishu, Zhiyang, Zhongwan, Qihai, Dachangshu, Daheng	94%	Facilitates nasal patency	[40]

qi deficiency. Based on TCM formulas and medicinals, FEI *et al.* [25] treated AR according to the wind theory that “wind is the leading cause of diseases”. They conducted a controlled trial between the observation group (treatment according to the wind theory; the formula was composed of *Herba Schizonepetae* 12g, *Radix Saposhnikoviae* 10g, *Radix Angelicae Sinensis* 12g, *Radix Rehmanniae* 12g, *Periostracum Cicadae* 6g, *Rhizoma Anemarrhenae* 12g, fried *Rhizoma Atractylodis* 12g, *Fructus Arctii* 12g, *Gypsum Fibrosum* 20g, *Fructus Mume* 6g, *Radix et Rhizoma Glycyrrhizae Praeparata cum Melle* 8g and *Bombyx Batryticatus* 8g) and the control group (orally taking desloratadine citrate disodium tablets). The findings indicated that treating AR according to the wind theory is a viable and remarkably effective method and presents more advantages in reliving an itchy nose. Under the guidance of “Heli Yangqi treatment” in *The Yellow Emperor’s Inner Classic*, WANG *et al.* [24] evaluated the clinical efficacy of self-made Yifei Tiaoxue Decoction and Qingre Tongyang Decoction on AR by randomly dividing 90 cases into the Yang qi deficiency group, qi stagnation group and the control group. Results demonstrated that both decoctions significantly relieved AR symptoms and reduced the degree of nasal mucosal swelling.

3. Acupuncture

As an essential medical intervention technique for the treatment of AR, acupuncture directly stimulates specific acupoints on the body to balance yin and yang, unblock the meridians and collaterals, and circulate qi and blood, thereby achieving the balance between yin and yang, harmony between qi and blood, and opening of the nasal orifices (Table 2). It was included in the American Clinical Practice Guideline: Allergic Rhinitis for the first time in 2015 [26]. Modern medicine has extensively proven that acupuncture is effective in regulating the neuroimmune system, reducing neurogenic inflammatory responses and swelling degree of the nasal mucosa, and inhibiting the increase in serum IgE levels [27].

At present, local point selection plus point selection along the meridians is the primary principle for treating AR with acupuncture (Table 3). As shown in Fig. 1, the frequently-used acupoints are Yingxiang Acupoint (LI 20), Yintang Acupoint (EX-HN3), Hegu Acupoint (LI 4), Feishu Acupoint (BL 13), Zusanli Acupoint (ST 36), Fengchi Acupoint (GB 20), Shenshu Acupoint (BL 23), Pishu Acupoint (BL 20), Shangyinxiang Acupoint (EX-HN8), and Dazhui Acupoint (DU 14). The primary meridians selected are the bladder meridian, the large intestine meridian and the Du meridian. According to the traditional point selection principle, Yingxiang Acupoint (LI 20) is a crossing point of the large intestine meridian and the stomach meridian, which is beneficial for removing wind and clearing heat, unblocking the nasal orifices, and can be used to treat many nasal diseases. Yintang Acupoint (EX-HN3), located above the nose,

Table 3
Specific localization of acupoints in traditional Chinese medicine.

Acupoint	Localization
Lieque (LU7)	On the radial edge of the forearm, above the styloid process of the radius, 1.5 inches above the wrist crease.
Hegu (LI4)	On the back of the hand, between the 1st and 2nd metacarpal bones, at the midpoint of the radial side of the second metacarpal bone.
Quchi (LI11)	At the lateral end of the elbow crease, when elbow is flexed, at the midpoint between Chize (LU5) and the lateral epicondyle of the humerus.
Yingxiang (LI20)	Next to the midpoint of the outer border of the nostril, in the nasolabial groove.
Zusanli (ST36)	On the anterior and lateral side of the lower leg, 3 inches below Dubi (ST35), one finger breadth from the anterior crest of the tibia.
Sanyinjiao (SP6)	On the medial side of the lower leg, 3 inches above the tip of the medial malleolus, behind the medial border of the tibia.
Xuehai (SP10)	When the knee is flexed, 2 inches above the medio-superior border of the patella, at the bulge of the medial portion of the quadriceps femoris muscle.
Daheng (SP15)	On the abdomen, 4 inches lateral to the center of the umbilicus.
Tongtian (BL7)	On the head, directly above the midpoint of the anterior hairline, 4 inches upwards, and 1.5 inches lateral.
Fengmen (BL12)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 2nd thoracic vertebra.
Feishu (BL13)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 3rd thoracic vertebra.
Geshu (BL17)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 7th thoracic vertebra.
Ganshu (BL18)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 9th thoracic vertebra.
Pishu (BL20)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 11th thoracic vertebra.
Weishu (BL21)	On the back, 1.5 inches lateral to the lower border of the spinous process of the 12th thoracic vertebra.
Shenshu (BL23)	On the lower back, 1.5 inches lateral to the lower border of the spinous process of the 2nd lumbar vertebra.
Dachangshu (BL25)	On the lower back, 1.5 inches lateral to the lower border of the spinous process of the 4th lumbar vertebra.
Gaohuangshu (BL43)	On the back, 3 inches lateral to the lower border of the spinous process of the 4th thoracic vertebra.
Zhishi (BL52)	On the lower back, 3 inches lateral to the lower border of the spinous process of the 2nd lumbar vertebra.
Taixi (KI3)	On the medial side of the foot, in the depression between the medial malleolus and the Achilles tendon.
Mingmen (GV4)	On the lower back, at the level of the 2nd lumbar vertebra, in the depression below the spinous process.
Zhiyang (GV9)	On the back, at the level of the 7th thoracic vertebra, in the depression below the spinous process.
Shenzhu (GV12)	On the back, at the level of the 3rd thoracic vertebra, in the depression below the spinous process.
Dazhui (GV14)	At the lower border of the spinous process of the 7th cervical vertebra.
Shangxing (GV23)	On the head, directly above the midpoint of the anterior hairline, 1 inch upwards.
Guanyuan (CV4)	On the lower abdomen, on the midline, 3 inches below the umbilicus.
Qihai (CV6)	On the lower abdomen, on the midline, 1.5 inches below the center of the umbilicus.
Shenque (CV8)	At the center of the abdomen, in the center of the umbilicus.
Zhongwan (CV12)	On the upper abdomen, on the midline, 4 inches above the center of the umbilicus.
Fengchi (GB20)	At the nape, below the occiput, level with Fengfu (GV16), between the upper portion of the sternocleidomastoid muscle and the trapezius.
Yintang	At the forehead, at the midpoint between the eyebrows, where the line connecting the eyebrows intersects with the midline of the forehead.
Shangyinxiang (LI20)	On the face, at the junction of the nasal ala and the nasal bone, near the upper end of the nasolabial groove.

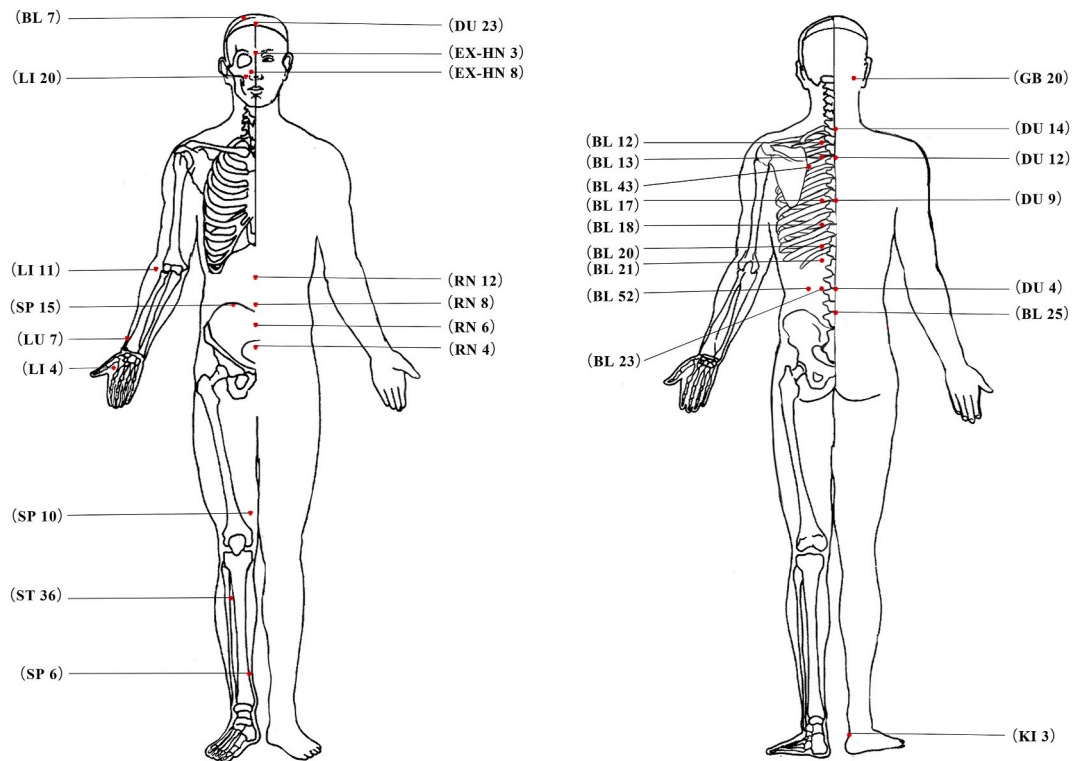


Fig. 1. Specific localization of acupoints in Traditional Chinese Medicine.

is a vital acupoint for treating nasal disorders [41]. Both Yingxiang Acupoint (LI 20) and Yintang Acupoint (EX-HN3) reflect the near-therapeutic effects of acupoints. Shangyinxiang Acupoint (EX-HN8), an extra point next to the nose, coupled with Yingxiang Acupoint (LI 20) and Yintang Acupoint (EX-HN3) is a classic empirical point combination known as the “three nasal points”, which combines the local point selection and point selection according to symptoms to enhance the therapeutic effect on nasal disorders [42]. Needling Hegu Acupoint (LI 4), a Yuan-primordial point of the large intestine meridian of hand-Yangming, can improve qi and blood, remove wind and release the exterior, eliminate pathogenic factors from the exterior, and unblock the nasal orifices, which has promising effects in the treatment of diseases of the facial orifices [43]. Zusanli Acupoint (ST 36) is the He-sea point of the stomach meridian and the lower He-sea point of the stomach; it “starts from the nose” of the stomach meridian and functions to supplement qi and secure the exterior, replenish deficiency and strengthen the body, and improve the immunity [44]. Fengchi Acupoint (GB 20), a crossing point of the gallbladder meridian and the Yangwei meridian, is a crucial acupoint for dispelling the wind. Dazhui Acupoint (DU 14) is a crossing point of the Du meridian and the six yang meridians. Needling these two posterior points for diseases located in the front of the body could make the yang meridians converge, activating yang qi, and reinforcing healthy qi to eliminate pathogenic factors. The crossing points are the most commonly used specific points. Acupoints such as Yingxiang Acupoint (LI 20), Fengchi Acupoint (GB 20) and Dazhui Acupoint (DU 14) intersect and connect with meridians and function to disperse qi and circulate blood, regulate the interior and exterior. The pathogenesis of AR is closely associated with the lungs, spleen and kidneys, which are easily attacked by pathogenic factors when deficient, resulting in the development of AR [45]. All the Feishu Acupoint (BL 13), Pishu Acupoint (BL 20) and Shenshu Acupoint (BL 23) are the points of the bladder meridian, and acupuncture of these three acupoints can achieve remarkable clinical curative effects for AR. Furthermore, these three points play a crucial role in the Back-Shu points, as specific points, and their combinations are conducive to enhance the therapeutic effect.

LU et al. [28] took the fire-needle acupuncture of Tongtian Acupoint (BL 7) and Shenzhu Acupoint (DU 12) combined with catgut-embedding therapy as the observation group and catgut-embedding therapy as the control group. The fire-needle acupuncture functioned to dispel the wind and disperse the cold, warm yang and unblock collaterals, while catgut-embedding therapy functioned as a long-term stimulation to prevent relapse. The efficacy rate of the combined therapy was as high as 96.97%, and the disease recurrence rate was only 9.3% four months after treatment. YU et al. [46] randomly divided 60 AR patients into observation and control groups. The control group received Zuo’s yang-warming acupuncture therapy, i.e. Dong’s extraordinary points: dà chà, huǒ zhǔ, huǒ lián and huǒ chuán, with an overall efficacy rate of 93.3%. Whereas, the control group received conventional acupuncture therapy with an efficacy rate of 63.3%. Yang-warming acupuncture therapy was found to be effective in treating AR, which can be extended to clinical application. Needling the sphenopalatine ganglion with the filiform needle, developed by Professor LI Xinwu according to the theory and methods of integrated traditional Chinese and Western medicine [47], is easy to use and shows immediate effect after more than decades of practice and observation of more than 100,000 patients. To compare the effects of needling the

sphenopalatine ganglion and needling the common acupoints, XU et al. [48] randomly divided 80 AR patients into the observation group and the control group according to the random number table. In the observation group, the needle was inserted into the space between the zygomatic arch and the mandibular coronoid process. In contrast, in the control group, the acupuncture was performed by needling the primary acupoints of Yingxiang Acupoint (LI 20), Yintang Acupoint (EX-HN3), or Fengchi Acupoint (GB 20). The study showed that acupuncture on sphenopalatine ganglion has a noticeable short-term clinical effect that quickly relieves symptoms and improves the quality of life.

4. Moxibustion

YANG et al. [29] observed the curative effect of ginger-insulated moxibustion in the treatment of 60 AR patients. The therapeutic method is as follows: first placed fresh ginger slices on the bilateral Feishu Acupoint (BL 13), then ignited the moxa cones (A moxa cone is a product made by hand or machine with a cone-shaped moxa velvet ball. When using moxa cones for moxibustion, the cone-shaped moxa balls burned are called moxa cones) on the fresh ginger slices to perform moxibustion until local skin flushing occurred, but without blistering. In addition, moxibustion of bilateral Pishu Acupoint (BL 20) was combined for patients with spleen deficiency and bilateral Shenshu Acupoint (BL 23) for patients with kidney deficiency. In the first course, the moxibustion was performed once a day for ten days. The second course started after 1–3 days. After a total of 3 courses of moxibustion, the treatment response rate was 91.7%. Moxibustion was then performed once a month for one year to consolidate the curative effect. LIN et al. [30] randomly divided 72 AR patients into a treatment group (treated by heat-sensitive moxibustion, heat-sensitive moxibustion is the use of mugwort heat produced by igniting mugwort to suspend moxibustion on heat sensitive acupoints) and a control group (treated with ephedrine nasal drops). After 20 days of treatment, the total efficacy rate in the treatment group was 83.33%, significantly higher than 66.67% in the control group ($P < 0.05$). XU [31] conducted a clinical observation on 70 eligible AR patients by randomly dividing them into treatment and control groups. A total of 62 patients (8 dropouts) completed the study, of which 32 patients in the treatment group received thunder-fire moxibustion combined with acupuncture, and 30 patients in the control group received moxibustion coupled with acupuncture. The findings indicated that both treatment methods are effective for the treatment of AR, meanwhile, the overall response rates of both groups were not significantly different. However, the marked response rate in the treatment group was markedly higher than that in the control group, providing available evidence for clinical application. SUN et al. [32] reported that Da Aiduan warm needle moxibustion has achieved a remarkable effect in the treatment of AR with lung qi deficiency-cold, the mechanism of which may be related to the decrease of serum IgE, IL-4 and the increase of IF- γ . To explore the curative effect of wheat-grain sized cone moxibustion in the treatment of AR with spleen qi deficiency, GAO [33] needled Yintang Acupoint (EX-HN3), bilateral Shangyingxiang Acupoint (EX-HN8), Fengmen Acupoint (BL 12), Zusanli Acupoint (ST 36), Pishu Acupoint (BL 20) and Weishu Acupoint (BL 21), and simultaneously conducted wheat-grain sized cone moxibustion on bilateral Pishu Acupoint (BL 20) and Weishu Acupoint (BL 21). After four courses of treatment, wheat-grain-sized cone moxibustion was clinically effective and beneficial for immune regulation.

5. Acupoint application

Acupoint application, one of the moxibustion methods, applies herbal cakes to acupuncture points. TANG et al. [34] treated 74 AR patients with acupoint application according to different syndromes. The overall response rate of the spleen qi deficiency pattern, kidney yang depletion pattern and lung qi deficiency-cold pattern were 88.46%, 88.23%, and 96.77%, respectively. TANG et al. [49] found that using Bimintong-Energy Patch on Yingxiang Acupoint (LI 20) and Shenque Acupoint (RN 8) to treat AR can be an alternative to antihistamines to some extent, reducing drug toxicity. ZHAO et al. [35] showed that acupoint application combined with acupuncture treating AR could regulate the functions of zang-fu organs from multiple levels and channels, balance yin and yang, improve the constitution, and achieve treatment of the symptoms and root cause. XU et al. [36] mixed herbal powders include *Radix Angelicae Dahuricae*, *Rhizoma Corydalis*, *Semen Sinapis*, *Radix et Rhizoma Asari*, and *Radix Kansui* with ginger juice paste, then applied the prepared paste to Yintang Acupoint (EX-HN3), Fengmen Acupoint (BL 12), Feishu Acupoint (BL 13) and Gaohuang Acupoint (BL 43) for 0.5–1 h, once every ten days, three times as a course. A total of 30 cases received the treatment, of which 24 had a marked response, resulting in an overall response rate of 96.7%. WU et al. [37] prepared herbal pastes by mixing fresh ginger juice with antiallergic herbal powder (composed of 8 herbs including *Semen Sinapis*, *Radix et Rhizoma Asari*, *Radix Kansui*, *Rhizoma Corydalis* and *Cortex Cinnamomi*). They applied the paste to Dazhui Acupoint (DU 14) and bilateral Fengmen Acupoint (BL 12). The paste was applied on dog days and non-dog days, once every ten days (10 h each time), for 4 applications. A total of 65 cases received the treatment in the dog days' group, of which 20 had a marked response, resulting in an overall response rate of 80.00%; a total of 174 cases received the treatment in the non-dog days' group, of which 65 cases had a marked response, resulting in an overall response rate of 86.78%; a total of 239 cases received the treatment in the acupoint application group, of which 85 cases had a marked response, resulting in an overall response rate of 84.94%; a total of 100 cases received the treatment in the desensitization group, of which 9 had a marked response, resulting in an overall response rate of 78.00%; a total of 136 cases received the treatment in the desensitization group, of which 43 cases had a marked response, resulting in an overall response rate of 83.82%; a total of 103 cases received the treatment in the season group, of which 31 cases had a marked response, resulting in an overall response rate of 81.55%. To observe the efficacy of acupoint application with rhinitis patches in the treatment of AR, CHEN et al. [38] treated 30 patients with rhinitis patches in the treatment group and 28 patients with acupuncture in the control group. The overall response rate was 90% in the treatment group and 71.4% in the control group, showing a significant difference in efficacy between the two groups ($P < 0.05$).

6. Acupoint catgut embedding therapy

REN et al. [39] observed the curative effect of acupoint catgut embedding therapy (include Dazhui Acupoint (DU 14), Fengchi Acupoint (GB 20), Feishu Acupoint (BL 13), Zhiyang Acupoint (DU 9) and Zhongwan Acupoint (RN 12)) combined with nasal patches (made from *Herba Schizonepetae* 10g, *Radix Saposhnikoviae* 6g, *Periostracum Cicadae* 3g, *Radix Angelicae Dahuricae* 6g, *Flos Magnoliae* 3g (wrap-boiling), *Fructus Xanthii* 3g) in the treatment of AR. Compared with conventional Western medicine, acupoint catgut embedding therapy plus acupoints application significantly improved symptoms in AR patients and showed lower relapse rates. WU et al. [50] addressed that acupoint catgut embedding therapy combined with desloratadine citrate disodium tablets dramatically reduced serum IL-33 levels in treating AR patients with deficiency of lung qi and spleen qi. The study by YAO et al. [51] on acupoint catgut embedding therapy in treating AR patients with lung and spleen deficiency syndrome found a sustained effect and significant reduction in the degree of inferior nasal concha swelling. QIN et al. [40] treated 197 AR patients by implanting 0.3–0.8 cm medical catgut 3/0 at selected points: (1) Quchi Acupoint (LI 11) and Zusanli Acupoint (ST 36); (2) Dazhui Acupoint (DU 14), Feishu Acupoint (BL 13), Pishu Acupoint (BL 20) and Shenshu Acupoint (BL 23); (3) Yintang Acupoint (EX-HN3), Yingxiang Acupoint (LI 20), Xuehai Acupoint (SP 10) and Sanyinjiao Acupoint (SP 6). Symptom-based point combinations are as follows: Ganshu Acupoint (BL 18), Geshu Acupoint (BL 17) and Taixi Acupoint (KI 3) for deficiency of lung qi and spleen qi; Hegu Acupoint (LI 4) and Lieque Acupoint (LU 7) for constraint-heat of the lung meridian; Mingmen Acupoint (DU 4), Zhishi Acupoint (BL 52) and Guanyuan Acupoint (RN 4) for depletion of kidney yang. The points selection was made according to groups (1), (2) and (3) in the first course and according to the syndrome in the second course. The treatment was given once a week, and one group of points was selected each time. The period between each course was 7–14 days, and the results were evaluated three courses later. There were 148 cases of curative treatment, and the overall response rate was as high as 94%.

7. Ear acupuncture

The zang-fu organs, meridians, five sensory organs and the nine orifices of the human body are an organic whole, of which the ear connects to the zang-fu organs through meridians. As a branch of acupuncture and moxibustion, ear acupuncture has a long history in China, which cures diseases by non-invasive ear stimulation. Ear acupuncture is effective and safe in the treatment of AR in previous reports [52–57]. WANG et al. [58] treated 300 cases of AR by applying *Semen Vaccariae* to auricular points: shén mén (TF4), gān (CO12), shèn (CO10), pí (CO13), fèi (CO14), xīn (CO15), yān (LO5), bí (TG1, 2i and TG4) and yān (TG3). The treatment was applied to the auricular points of two ears alternately, once every three days. Patients were required to press the wáng bù liú xíng (*Semen Vaccariae*) 5–7 times a day, causing a feeling of distending pain in the points and a burning sensation in the auricle, ten times as a course of treatment. The 100 cases in the control group were treated with Biyankang tablets, four tablets each time, three times a day, for 30 days as a course. Both groups were treated for three courses. One hundred ninety cases and 12 cases were recovered in the treatment and control groups, respectively, and the overall response rate was 99.0% and 40%, respectively, significantly different ($P < 0.05$). FAN [59] used tack-shaped ear needles on auricular points covered fèi (CO14), qì guǎn (CO16), nèi bí (TG4), wài bí (TG1, 2i), dà cháng (CO7), guò mǐn diǎn and shèn shàng xiàn (TG 2P) to treat 50 cases of AR patients. For spleen and stomach deficiency, pí (CO13), wèi (CO4) and sǎn jiǎo (CO17) were added; for yin deficiency with internal heat, gān (CO12), shèn (CO10), jiǎo gǎn (AH6a) and shén mén (TF4) were added. The auricular points of both ears were used alternately. Patients were asked to hold the ear needles between their thumb and forefinger and then gradually increase the pressure to produce a sensation of soreness, distension, numbness and pain, 4–5 times a day, 3–5 min for each point. The needles were changed every three days, and every eight treatments as a course, for a total of two courses. Twenty-eight cases were successful, accounting for 56%; 12 cases were markedly effective, accounting for 24%; 9 cases were effective, accounting for 18%; 1 case was ineffective, accounting for 2%, resulting in an overall response rate of 98%.

8. Combination treatments

YAN et al. [60] needed the endonasal bilateral yíng xiāng (LI 20) and agger nasi under the nasal endoscope in combination with qi supplementation and allergy-relieving decoction to treat patients with moderate to severe AR for two weeks. The results showed the excellent effect of endonasal acupuncture plus qi supplementation and allergy-relieving decoction in treating moderate to severe AR, indicating that the regimen can be a complementary or alternative therapy for AR. In the treatment of AR with acupuncture combined with decoction, ZHU [61] reported that the effect of the acupuncture-decoction combination group, with the advantages of economy, safety and few side effects, was significantly better than the acupuncture-only group ($P < 0.05$) after three weeks of treatment. XIA et al. [62] found that an acupuncture-medicine combination can significantly reduce immune indices such as serum IgE levels of AR in children and improve nasal breathing. ZHANG et al. [63] investigated the clinical effect of acupuncture and medicine combination in treating AR with deficiency-cold of the lung and spleen. After six weeks of treatment, the results showed that the combination of acupuncture and medication not only improved the sleep quality and nasal symptoms of AR patients, but also relaxed their mood and regulated their emotions.

9. Conclusion

AR severely affects the physical and mental health of patients and reduces their quality of life. The number of AR patients is increasing dramatically under the influence of the global environment, making the disease more clinical concern. Fortunately, TCM, especially decoction and acupuncture, possesses features and advantages of flexible, diverse treatment methods and options with great

promise, which can partially compensate for the disadvantages of Western medicine, such as low adherence, high cost, multiple toxic and side effects, etc. Combining treatment methods such as decoction and acupuncture are more effective than use alone, extending a new way of thinking about the clinical treatment of AR. However, some limitations still exist in the treatment of AR with TCM: ① There is a need to increase the sample size to conduct more high-quality randomized controlled trials (RCTs). ② Too many acupuncture points selected, which may make patients anxious and reduce healing effect. ③ There is a lack of uniformity and normalisation in selecting decoctions and acupuncture points due to individual differences. ④ Although there are many methods for treating AR, no agreement has been reached. ⑤ Most of the studies observed short-term effects and lacked long-term follow-up. How to improve and extend the efficacy of the TCM treatment regimen, reduce the relapse rate and improve the quality of life of AR patients are essential issues that need to be urgently addressed by medical professionals in the future.

Disclosure statement

The authors declare that the research was conducted without any commercial or financial relationships construed as a potential conflict of interest.

Data availability statement

Data included in article/supp. material/referenced in article.

CRediT authorship contribution statement

Jing Yue: Writing – original draft. **Dingqian Hao:** Supervision. **Shengyang Liu:** Resources. **Jin Zhuang Yu:** Methodology. **Linghui Meng:** Software. **Jian Lv:** Visualization. **Jinhao Guo:** Writing – review & editing.

Declaration of competing interest

The authors declare that they have no known competing financial interests or personal relationships that could have appeared to influence the work reported in this paper.

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