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Observation on the Efficacy of Self-formulated Huatan Chushi Zhuyu Decoction in the Treatment of Adenoid Hypertrophy in Children and Literature Research on Traditional Chinese Medicine Treatment

Ying Wang [1], Changwen Che [2], Mingsheng Zhang [2], Zhonghai Xin [3,*]

[1] Department of Otorhinolaryngology, Changping District Integrated Traditional Chinese and Western Medicine Hospital, Beijing 102208, China

[2] Department of Otorhinolaryngology, Dongzhimen Hospital, Beijing University of Chinese Medicine, Beijing 100007, China

[3] Department of Otorhinolaryngology, Wangjing Hospital, China Academy of Chinese Medical Sciences, Beijing 100102, China

*** Correspondence**:

Zhonghai Xin

xzh_d716@163.com

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Abstract

To observe the clinical efficacy of the self-formulated Huatan Chushi Zhuyu Decoction (HCZ Decoction) combined with basic Western medical treatment in children with moderate to severe adenoid hypertrophy (AH) accompanied by allergic rhinitis (AR), and to explore the theoretical basis by referring to traditional Chinese medicine (TCM) literature. A retrospective analysis was conducted. A total of 84 children with moderate to severe AH admitted to the outpatient department from January 2022 to December 2024 were included and divided into the decoction group (43 cases) and the non-decoction group (41 cases) according to the treatment regimen. The non-decoction group was treated with mometasone furoate nasal spray (100 μg/d) + montelukast (4-5 mg/d) for 2 weeks, combined with cetirizine (5-10 mg/d) for anti-allergy. On this basis, the decoction group was additionally given the HCZ Decoction (including tangerine peel, Poria cocos, Pinellia ternata, licorice, Arisaema cum Bile, peach kernel, Spina Gleditsiae, etc.), one dose per day, taken after breakfast and dinner, with a treatment course of 2 weeks. Baseline data such as age, gender, and BMI of the children in the two groups were collected. The differences in nasal symptom scale, pediatric sleep disorder scale, polysomnography (PSG) parameters, and the degree of AH before and after treatment were compared. The t-test and chi-square test were performed using SPSS 27.0 statistical software, with a significance level of $P < 0.05$. Chinese databases such as CNKI and Wanfang (from 2014 to 2024) were systematically searched. Using the Citespace 6.3 literature processing tool, the hotspots and clustering information of keywords,

institutions, and co-authors related to the TCM treatment of AH in Chinese literature were analyzed. There were no statistical differences in general data and clinical baseline data between the two groups ($P > 0.05$), indicating comparability. The scores of various items in both the decoction group and the non-decoction group decreased after treatment, confirming the effectiveness of the treatment. The total score of OSA-18 was at the moderate to severe level, and there were differences in the total score and the changes of various scores between the decoction group and the non-decoction group, with the scores of the decoction group being lower. There was a difference in the change score of the total nasal symptom score (TNSS) between the two groups, mainly manifested in nasal obstruction and sneezing. There were no differences in the changes of OAHI and LSaO2 scores between the two groups. The literature study showed that the core therapeutic methods of TCM treatment for AH are "resolving phlegm, removing dampness, and promoting blood circulation to remove blood stasis", which highly coincides with the compatibility of the self-formulated decoction. The HCZ Decoction combined with basic Western medical treatment can significantly improve the nasal symptoms and sleep quality of children with moderate to severe AH accompanied by AR. Its curative effect may be achieved by regulating the local inflammatory response rather than reducing the volume of the adenoids. TCM literature supports that ‘the intermingling of phlegm, blood stasis, and dampness’ is the core pathogenesis of AH. This decoction provides a safe and effective non-surgical treatment option for clinical practice.

Keywords: Adenoid Hypertrophy; Allergic Rhinitis; Decoction

1. Introduction

AH is a common disease in pediatric otorhinolaryngology, which has a high incidence during the physiological AH period of children aged 4 to 6 years. Epidemiological surveys show that its incidence rate is as high as 30%-40% (Tse et al., 2023). The occurrence of this disease is closely related to AR, recurrent upper respiratory tract infections, obesity, atopic constitution, and genetic factors (Niedzielski et al., 2023). In addition to local symptoms such as nasal obstruction, rhinorrhea, and sinusitis, the most serious complication of AH is obstructive sleep apnea hypopnea syndrome (OSA), which can lead to the disruption of children's nighttime sleep structure. Consequently, it can trigger attention deficit hyperactivity disorder (ADHD) during the day, abnormal emotional behaviors, and disorders of nighttime growth hormone secretion, affecting neurocognitive development and physical growth (Shivnani et al., 2023). Moreover, the long-term state of mouth breathing can lead to abnormal maxillofacial development (adenoid facies), increase the difficulty of orthodontic treatment, and induce secretory otitis media through eustachian tube dysfunction, thus affecting auditory function (Shivnani et al., 2023; Zhang et al., 2024).

With the transformation of the modern medical model and the update of health concepts, the standardized diagnosis and treatment of AH have increasingly received attention. As the gold standard treatment method, adenoidectomy's curative effect is influenced by factors such as the age of the child patient, atopic constitution, and the mucosal repair ability after surgery (Randall,

2020). Conservative drug treatment (nasal glucocorticoids + leukotriene receptor antagonists) has a certain curative effect on children with AH complicated by AR (Eldegeir et al., 2023). However, studies have shown that about 9% of cases require secondary surgical intervention (Schupper et al., 2018). In clinical practice, some parents refuse surgery due to concerns about surgical risks or ethical issues, and simply using Western medicine treatment often fails to achieve the expected results (Zwierz et al., 2024). Therefore, exploring a safe and effective integrated traditional Chinese and Western medicine treatment plan is of great clinical significance.

Based on the TCM pathogenesis theory of "intermingling of phlegm and blood stasis", this study proposes the therapeutic method of "resolving phlegm, removing dampness, and promoting blood circulation to remove blood stasis". It is planned to combine a self-formulated TCM decoction with Western medicine treatment to improve the clinical symptoms of children patients. The aim of this study is to verify the clinical efficacy of this decoction through a retrospective study. With the support of bibliometric research, this study aims to provide evidence support for the TCM clinical non-surgical treatment of AH.

2. Materials and Methods

2.1. General Information

Children's cases that met the diagnostic criteria for AH and AR (Ahmad et al., 2023; Cheng et al., 2024), were treated at the outpatient department of the Otolaryngology Department of our hospital from January 2022 to December 2024, had complete information, and were under 12 years old were collected. A total of 84 cases that met the inclusion criteria and exclusion criteria were included in the study. The general information of the cases, including age, gender, body mass index (BMI), the degree of AH, etc., was collected.

2.2. Clinical Information

2.2.1 Inclusion and Exclusion Criteria

Inclusion Criteria:

① Children who meet the diagnostic criteria for OSA and AR, do not meet the surgical indications such as adenoidectomy and need to receive conservative treatment as evaluated by doctors, as well as children who meet the surgical indications but whose guardians insist on choosing conservative treatment and are willing to follow the research protocol for TCM intervention; ② Children under 12 years old; ③ Children who meet the syndrome type of deficiency of qi in the spleen and lung with intermingling of phlegm and blood stasis; ④ The guardians of the children have a full understanding of the research purpose, methods, possible benefits and risks, and voluntarily sign the informed consent form; ⑤ Children who are willing to accept the TCM treatment plan and are willing to cooperate with the requirements of various examinations, follow-ups during the entire research process.

Exclusion Criteria:

① Children suffering from serious diseases of important organs such as the heart, liver, kidney, and lung, or suffering from malignant tumors and hematological diseases; ② Children with a clear history of allergy to the traditional Chinese medicine or related drug components to be used in the study; ③ Children who have received other systemic treatments that may affect the results of this study within 4 weeks before the start of the study; ④ Children or their guardians who cannot cooperate well with the study, such as being unable to take medicine on time or attend follow-ups on time; ⑤ Children with mental diseases who are unable to cooperate with the treatment, or those who are in the acute infection period and are not suitable for the study of traditional Chinese medicine treatment.

2.2.2. Research Grouping

The study was conducted in a retrospective analysis and parallel control manner. According to whether the self-formulated decoction was taken or not, the cases were divided into two groups: the non-decoction group (41 cases) and the decoction group (43 cases). The non-decoction group was treated with mometasone furoate nasal spray (100 μg/d) + montelukast (4-5 mg/d) for 2 weeks, combined with cetirizine (5-10 mg/d) for anti-allergy. On this basis, the decoction group was additionally given the HCZ Decoction (including tangerine peel, Poria cocos, Pinellia ternata, licorice, Arisaema cum Bile, peach kernel, Spina Gleditsiae, etc.), one dose per day, taken after breakfast and dinner, with a treatment course of 2 weeks.

2.2.3. Observation Indicators

Baseline clinical data within one week before the start of treatment and outcome clinical data at the end of treatment were collected for the enrolled cases, including the degree of AH under endoscopy, OSA - 18 score, TNSS score, and PSG test results.

Endoscopic evaluation: Nasal fibro – nasopharyngoscopy was used for examination. The color and swelling degree of the nasal mucosa, the size of the turbinate, the condition of secretions in the nasal passages, the degree of obstruction of the posterior nasal choanae by the adenoids, and the characteristics of the surface secretions of the adenoids were systematically and carefully observed. The degree of obstruction of the posterior nasal choanae by the adenoids was determined using a percentage as a quantitative index. Specifically, when the adenoids obstructed 50% of the posterior nasal choanae, it was defined as mild obstruction; when the obstruction ratio was between 50% (exclusive) and 75% (inclusive), it was classified as moderate obstruction; if the obstruction ratio was greater than or equal to 75%, it was determined as severe obstruction (Varghese et al., 2016).

OSA-18 score: As an evaluation method for pediatric snoring, it is divided into five aspects: sleep impact, physical symptoms, emotional impact, daytime state, and impact on guardians, with a total of 18 items (Alimoglu et al., 2020). In this study, an evaluation rule of 1-7 points was adopted. 1 point indicated no such problem, 2 points indicated almost none, 3 points indicated rarely, 4 points indicated sometimes, 5 points indicated often, 6 points indicated mostly, and 7 points indicated definitely. A score <= 60, 60 - 80, >= 80 points represented mild, moderate,

and severe impacts on the child's life, respectively. The total OSA-18 score was the sum of the scores of the five aspects, ranging from 7 to 126 points. The evaluation times were within one week before treatment and at the end of treatment.

TNSS score: It is used for the evaluation of nasal symptoms of AR. In this study, it was used for the evaluation of nasal symptoms of AH complicated by AR. The evaluation was divided into four dimensions: nasal congestion, nasal itching, runny nose, and sneezing. Each dimension used a scoring range of 0-3 points. The more severe, the higher the score of the symptoms. 0 points corresponded to no such symptoms; 1 point corresponded to mild symptoms that did not trouble daily life; 2 points corresponded to moderate symptoms that made the patient feel troubled but did not interfere with normal activities or sleep; 3 points corresponded to severe symptoms that seriously affected daily activities and sleep status (Cheng et al., 2024). The total TNSS score was the sum of the scores of the four dimensions, ranging from 0 to 12 points. The evaluation time points were set within one week before treatment and at the end of treatment.

Sleep evaluation: PSG testing was used for the objective evaluation of OSA. The whole - night sleep monitoring method was adopted for PSG, with a monitoring time of more than 7 hours. Information such as nasal airflow, blood oxygen, heart rate, respiratory movement, body position, and snoring was collected. Two people manually interpreted the monitoring data to obtain a report. With OAHI ＞＝ 1 as the diagnostic standard for OSA (Ahmad et al., 2023), the OAHI and LSaO2 indicators were collected. The evaluation time points were set within one week before treatment and at the end of treatment.

2.3. Bibliometric Research Method

The bibliometric analysis of the literatures retrieved from CNKI and Wanfang databases was carried out using the tool Citespace 6.3. The search terms were "adenoid hypertrophy", the search scope was set as "title", the search time range was set from January 2000 to December 2024, and the literature type was set as journal articles. Manually, the articles that met the requirements related to the traditional Chinese medicine treatment of adenoid hypertrophy were selected according to the titles and abstracts.

The bibliographic citation information of the literatures in ref format was exported and then imported into the Citespace software. Duplicate literatures were screened out, and a total of 2,237 literatures were finally counted. Appropriate time slices, node types, and threshold parameters were set in the software interface. The network visualization effect and analysis precision were adjusted, and the analysis was run to generate a knowledge graph. The co-citation relationships among the "keywords" of the literatures, the ranking of hotspots, the time series of article publication, and the relationships among the publishing institutions and authors were presented.

2.4. Statistical Method

The SPSS 24.0 software was used. For the comparison of continuous variables between groups, one-way analysis of variance was adopted, and the test level was set as $\alpha = 0.05$. A P value less than 0.05 indicated that the difference was statistically significant. The general linear model repeated measures test was used for the detection of repeated measurement data in the two groups.

3. Results

3.1. Comparison of General Information between the Decoction Group and the Non-decoction Group

A total of 84 cases were included in the study, with 43 cases in the decoction group and 41 cases in the non-decoction group. The average ages of the two groups were 6.37 years old and 5.65 years old respectively. According to the BMI values of the cases, they were divided into two categories: normal and overweight. Among them, the overweight cases in the decoction group accounted for 11.63% (5/43), and those in the non-decoction group accounted for 17.07% (7/41). The body weights of the cases in both groups were mainly within the normal range. The degrees of adenoid hypertrophy in both groups were mainly moderate to severe, accounting for 79.07% (34/43) in the decoction group and 82.93% (34/41) in the non-decoction group.

There were no significant differences in age, gender composition, body weight characteristics, and the degree of adenoid hypertrophy between the cases in the decoction group and the non-decoction group (p ＞＝ 0.05, see Table 1). The general information levels between the groups were consistent, indicating comparability.

Table 1. Comparison of the general data between the decoction group and the non-decoction group

	cases	gender		age	BMI		AH		
		male	female		normal	Over weight	0	1	2
decoction group	43	22	21	6.37±2.39	38	5	9	16	18
non-decoction group	41	24	17	5.65±2.09	34	7	7	13	21
P value	-	0.519		0.150	0.544		0.689		

3.2. Comparison of Baseline Data of Clinical Observations between the Decoction Group and the Non-decoction Group

The baseline statistics of clinical data for the decoction group and the non-decoction group included the total OSA-18 score, the total TNSS score, and the values of OAHI and LSaO2 from PSG. There were no significant differences in the above-mentioned scores and values between the two groups (p＞＝0.05, see Table 2). The levels of clinical observation data between the groups were consistent, indicating comparability. The OSA-18 scores were mainly at the moderate level, suggesting that AH had a moderate impact on the lives and daily activities of the children. The enrolled children mainly had mild to moderate OSA.

Table 2. Comparison of the baseline data before treatment between the decoction group and the non-decoction group

	OSA-18	TNSS(total)	OAHI	$LSaO_2$
decoction group	70.58±2.71	7.27±1.29	5.06±1.65	88.12±1.87
non-decoction group	70.90±2.93	6.92±1.31	4.87±1.66	88.26±1.92
P value	0.604	0.219	0.598	0.757

3.3. Comparison of Observation Indicators of Adenoid Hypertrophy between the Decoction Group and the Non-decoction Group

The scores of the five aspects of OSA-18, namely sleep impact, physical symptoms, emotional impact, daytime state, and impact on guardians, were statistically analyzed respectively. It was found that after treatment, the scores of all items and the total score of all cases were lower than the baseline scores before treatment. The results of the test using the general linear model for repeated measures are shown in Table 3.

Between-group effect: There was a significant between-group difference in the total OSA-18 score between the two groups ($p < 0.001$); specifically, in terms of the four aspects of treatment's impact on sleep, body symptoms, daytime state, and impact on guardians, there were between-group differences in the scores ($p < 0.001$, $p < 0.001$, $p = 0.002$, $p < 0.001$).

Time effect: The total OSA-18 score and the scores of all five aspects decreased after treatment, and there were significant differences in the scores of the cases before and after treatment ($p < 0.001$).

Interaction effect between group and time: There were differences in the changing trends of the total OSA-18 score and the scores of all five aspects before and after treatment between the two groups ($p < 0.001$, $p < 0.001$, $p = 0.008$, $p = 0.004$, $p = 0.004$, $p < 0.001$), indicating an interaction effect. There were differences in the treatment scores between the decoction group and the non-decoction group.

Table 3. Comparison of the OSA-18 scores before and after treatment between the decoction group and the non-decoction group

	sleeping		Body symptom		mood		daytime		guidians		Total	
	before	after	before	after	before	after	before	after	before	after	before	after
decoction grou	16.93 ±1.54	6.60± 1.23	16.20 ±1.42	8.20± 0.96	6.34± 1.25	4.53± 0.63	10.86 ±1.31	5.25± 0.95	20.23 ±1.37	11.88 ±1.19	70.58 ±2.71	36.46 ±2.59

p												
non-decoction group	12.60±1.61	9.46±1.38	16.41±1.46	9.46±1.14	6.58±1.30	4.75±0.85	10.95±1.49	6.41±1.04	20.34±1.29	14.04±1.70	70.90±2.93	44.14±3.31
treatment												
P value	＜0.001		＜0.001		＜0.001		＜0.001		＜0.001		＜0.001	
η^2	0.947		0.938		0.949		0.907		0.938		0.981	
treatment*grouping interaction												
P value	＜0.001		0.008		0.004		0.004		＜0.001		＜0.001	
η^2	0.372		0.082		0.000		0.097		0.230		0.429	
grouping												
P balue	＜0.001		＜0.001		0.246		0.002		＜0.001		＜0.001	
η^2	0.290		0.144		0.016		0.109		0.237		0.517	

3.4. Comparison of Nasal Symptoms of Allergic Rhinitis between the Decoction Group and the Non-decoction Group

The scores of the four dimensions of TNSS, namely nasal congestion, nasal itching, runny nose, and sneezing, were statistically analyzed respectively. It was found that after treatment, the scores of all items and the total score of all cases were lower than the baseline scores before treatment. The results of the test using the general linear model for repeated measures are shown in Table 4.

Between-group effect: The total TNSS score and the scores of all four dimensions decreased after treatment, and there were no significant differences in the scores of the cases before and after treatment between the two groups (p ＞＝ 0.05).

Time effect: The total TNSS score and the scores of all four dimensions decreased after treatment, and there were significant differences in the scores of the cases before and after treatment ($p < 0.001$).

Interaction effect between group and time: There were differences in the changing trends of the total TNSS score and the scores of nasal congestion and sneezing before and after treatment between the two groups ($p < 0.001$, $p < 0.001$, $p = 0.006$), indicating an interaction effect. There were differences in the total TNSS score, the scores of nasal congestion and sneezing treatment

between the decoction group and the non-decoction group, while there were no differences in the symptoms of nasal itching and rhinorrhea.

Table 4. Comparison of the TNSS scores before and after treatment between the decoction group and the non-decoction group

	Nasal obstruction		itching		rhinorrhea		sneezing		total	
	before	after	before	after	before	after	before	after	before	after
decoction group	2.53±0.50	0.69±0.70	1.02±0.85	0.23±0.47	2.00±0.65	1.32±0.47	1.72±0.59	10.9±0.29	7.27±1.29	3.34±1.13
non-decoction group	2.34±0.57	1.24±0.66	1.07±0.78	0.48±0.59	2.02±0.68	1.31±0.47	1.48±0.55	1.19±0.40	6.92±1.31	4.24±1.13
Treatment										
P value	＜0.001		＜0.001		＜0.001		＜0.001		＜0.001	
η^2	0.778		0.480		0.527		0.420		0.855	
Treatment*grouping interaction										
P value	＜0.001		0.198		0.820		0.006		＜0.001	
η^2	0.182		0.020		0.0.001		0.088		0.173	
grouping										
P value	0.092		0.244		0.939		0.441		0.221	
η^2	.034		.017		0.000		0.007		0.018	

3.5. Comparison of Sleep Observation Indicators between the Decoction Group and the Non-decoction Group

The scores of the two dimensions of PSG, namely OAHI and LSaO2, were statistically analyzed. It was found that after treatment, the OAHI scores of all cases were lower than the baseline values, and the LSaO2 scores were higher than the baseline values. The results of the test using the general linear model for repeated measures are shown in Table 5.

Between-group effect: The OAHI score decreased after treatment, and the LSaO2 score increased after treatment. There were no significant differences in the scores of the cases before and after treatment between the two groups (p ＞＝ 0.05).

Time effect: The OAHI score decreased after treatment, and the LSaO2 score increased after treatment. There were significant differences in the scores of the cases before and after treatment ($p < 0.001$).

Interaction effect between group and time: There were no differences in the changing trends of the scores of the two dimensions of OAHI and LSaO2 before and after treatment between the two groups (for the scores of the two dimensions of OAHI and LSaO2), indicating no interaction effect. There were no differences in the scores of the two dimensions of OAHI and LSaO2 between the decoction group and the non-decoction group before and after treatment.

Table 5. Comparison of the PSG-related scores before and after treatment between the decoction group and the non-decoction group

	OAHI		$LSaO_2$	
	before	after	before	after
decoction group	5.06±1.65	0.53±0.63	87.72±2.02	96.02±2.09
non- decoction group	4.87±1.66	046±0.55	88.43±1.89	96.14±2.18
Treatment				
P value	＜0.001		＜0.001	
η^2	0.882		0.895	
treatment*grouping interaction				
P value	0.740		0.330	
η^2	0.001		0.0.012	
grouping				
P value	0.518		0.207	
η^2	0.005		0.019	

3.6. Bibliometric Analysis of Traditional Chinese Medicine Treatment for Adenoid Hypertrophy

According to the bibliometric analysis and statistics, the keywords in terms of citation quantity and ranked by time are as follows: Yu Jingmao, deficiency of qi in the lung and spleen, nasal obstruction, TCM clinical practice, children, review, curative effect, external treatment method, pediatric tuina, and data mining.

Pediatric tuina and data mining are relatively hot keywords in recent years (Figure 1, A). In terms of the results of keyword clustering hotspots, the top 10 ranked keywords are: clinical experience, children, deficiency of qi in the spleen and lung, pediatric tuina, snoring and sleeping, data mining, experience of famous doctors, review, curative effect, intermingling of phlegm and blood stasis, Erchen Decoction, TCM, staged treatment, Yu Jingmao and children (Figure 1, B, C).

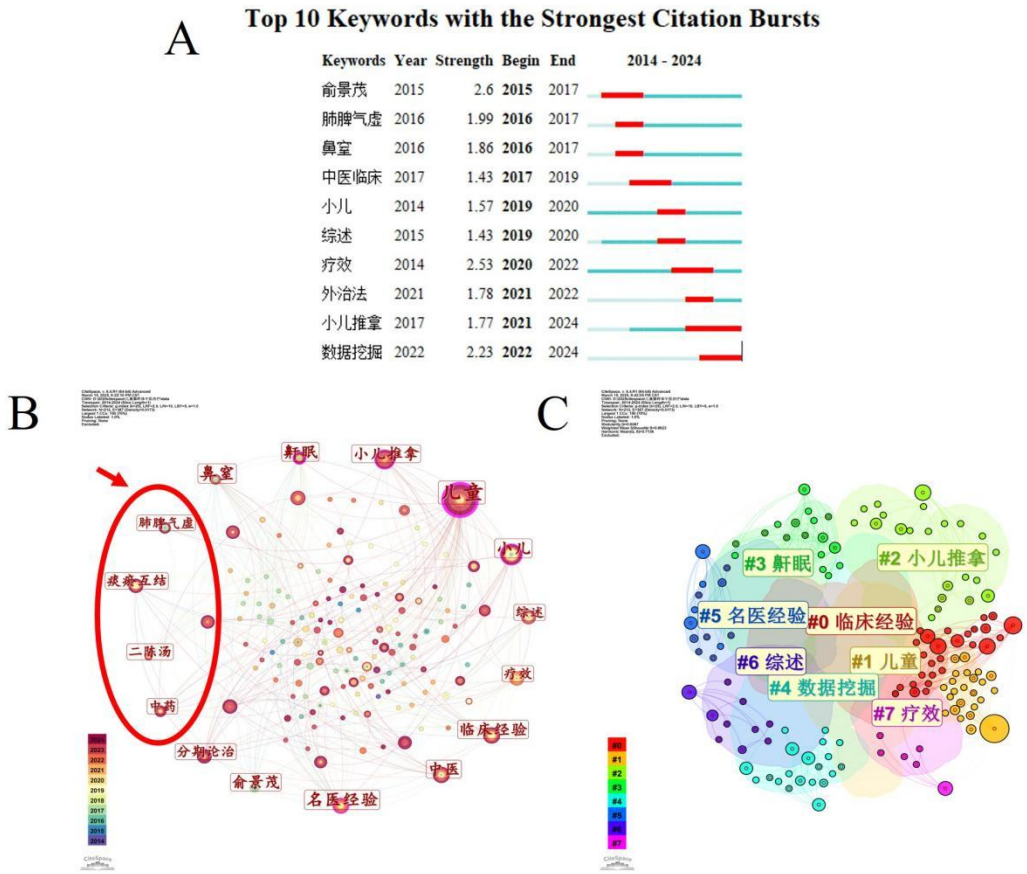

Figure 1. Cluster Analysis and Hotspot Analysis of Keywords in the Treatment of AH in Children with TCM

Arranged in chronological order, the articles summarizing the clinical experience of TCM treatment for AH in children have the longest citation time span, showing a uniform distribution from 2014 to 2024. The citations of articles on data mining of TCM treatment for AH in children have increased significantly in the past five years.

Among the authors of the published articles, the top three most cited are Jiang Zhiyan, Liu Zhuyun, and Ren Xianzhi. Among the institutions of the published articles, the top three most cited are Longhua Hospital Affiliated to Shanghai University of Traditional Chinese Medicine, Shanghai University of Traditional Chinese Medicine, and the Seventh Hospital Affiliated to Shanghai University of Traditional Chinese Medicine.

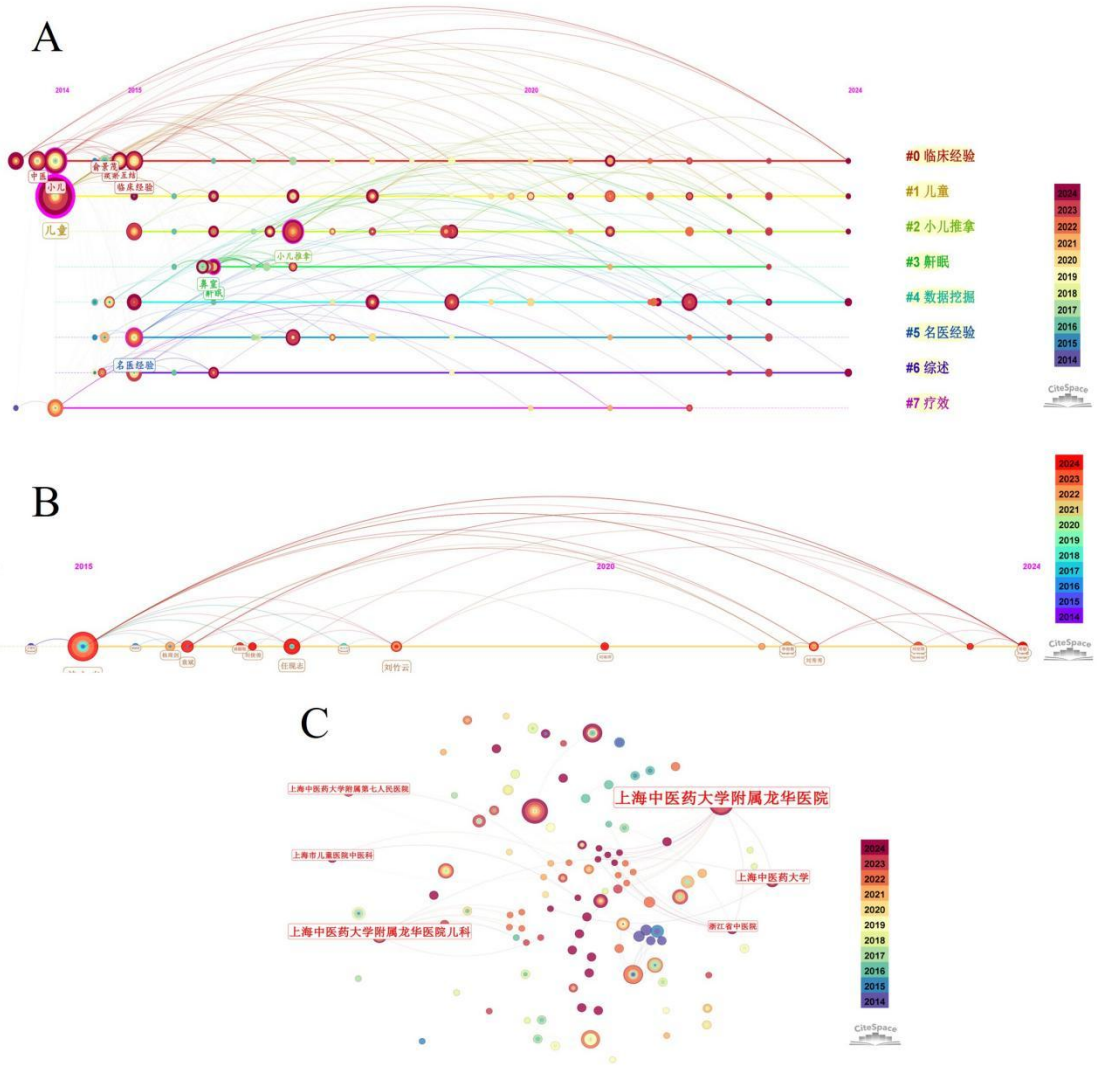

Figure 2. Arrangement of Keywords and author citation in Chronological Order and Co-occurrence of Institutional Co-citations

4. Discussion

According to modern medical concepts and relevant guidelines (Ahmad et al., 2023; Joseph et al., 2025), for AH, the conservative treatment methods mainly focus on the application of nasal glucocorticoids and leukotriene receptor antagonists. In addition, some research reports have pointed out that second-generation antihistamine drugs play a certain role in controlling nasal symptoms and ear complications (Velentza et al., 2020). In the field of treating AR in children, nasal glucocorticoids and second-generation antihistamine drugs have been clearly listed as the preferred treatment options. At the same time, the importance of immunotherapy, health education, and nursing has also been emphasized (Pavon-Romero et al., 2021).

However, in clinical practice, even if children meet the surgical indications for AH, some parents still prefer conservative treatment. Behind this phenomenon, there are both subjective factors such as cultural differences and many objective factors. For example, surgery cannot completely cure AR, and it may be complicated by chronic sinusitis after surgery. There may even be a situation where the AH again and require reoperation. Relevant studies have shown that

factors such as the first surgical age being less than 2 years old, frequent upper respiratory tract infections, suffering from AR, and genetic factors are all risk factors for secondary adenoidectomy (Lee et al., 2018). Moreover, eustachian tube dysfunction after surgery is relatively common, and it often requires repeated tympanic membrane puncture or even tube insertion to improve hearing (Diksha et al., 2022).

It can be seen that relying solely on modern medical drug treatment is difficult to fully meet the clinical needs of conservative treatment for AH. Therefore, exploring new treatment options to further improve the treatment effect and meet the actual clinical needs is of great practical significance. Traditional medicine has shown significant advantages in the treatment of AH and AR and has gained widespread cultural recognition in China. Many domestic research reports have shown that TCM and non-drug external treatment methods of TCM can effectively improve the symptoms of AH and the clinical manifestations of AR (Sun et al., 2019; Zhang et al., 2020).

Based on a systematic summary of previous research reports and personal clinical experience, this study uses a self-formulated HCZ Decoction to treat children with AH complicated by AR, aiming to observe the clinical efficacy of this decoction on the basis of standard modern drug treatment.

The results of this study showed that the clinical symptoms of OSA in all the included cases improved after treatment. The OSA-18 score decreased from moderate to mild after treatment, indicating that both the treatment in the decoction group and the non-decoction group was effective, and the treatment effect of the decoction group was better than that of the non-decoction group, with a between-group difference. This superiority was manifested in five aspects: sleep impact, body symptoms, mood impact, daytime state, and impact on guardians. The conclusion of this study is consistent with the viewpoints reported in previous studies (Zhang et al., 2020; Zhao et al., 2023).

In terms of the improvement of nasal symptoms, although the decoction group did not show superiority compared with the non-decoction group, the improvement trends of nasal obstruction and sneezing symptoms were different from those of the non-decoction group, suggesting that the decoction group still had advantages in the treatment of nasal symptoms, which was in line with the viewpoints in the previous literatures on the treatment of AR in children with TCM (Zhang et al., 2020). However, there were no differences in the trends and effects of improving OAHI and LSaO2 between the two groups, indicating that the treatment with this decoction may not have shown advantages in improving objective scores.

The bibliometric study suggested that the treatment of AH with TCM focused more on the experience summary of famous veteran Chinese medicine doctors and the mining of clinical data. The clinical syndrome differentiation mainly focused on deficiency of qi in the spleen and lung and the intermingling of phlegm and blood stasis. Taking Erchen Decoction as an example, the medication focused on removing dampness, resolving phlegm, and promoting blood circulation to remove blood stasis, providing literature support for the composition of the decoction in this study.

The innovation of this study lies in combining clinical observation with bibliometric research, analyzing the clinical impact of the method of resolving phlegm, removing dampness, and

promoting blood circulation to remove blood stasis in the treatment of AH, and providing a reference basis for the conservative treatment of AH complicated by AR with traditional medicine in clinical practice. The deficiency is that further follow-up was not carried out to explore the long-term effects of AH treatment. The sample size of this study still needs to be expanded to clarify the impact of treatment on objective evaluation results.

Author Contributions:

Ying Wang and Zhonghai Xin designed the work; Ying Wang, Changwen Che contributed to the acquisition, analysis, and interpretation of data; Ying Wang wrote the main manuscript and prepared all the figures. Mingsheng Zhang and Zhonghai Xin revised the manuscript. All authors reviewed the manuscript.

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Not applicable.

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All authors declare no competing interests.

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