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HEAD & NECK

Meta-analysis of Chinese medicine in the treatment of adenoidal hypertrophy in children

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Abstract

Objective To evaluate the efficacy and safety of Chinese medicine in the treatment of adenoid hypertrophy in children.

Method Screening standard articles, extracting relevant data from meta-analysis, were analyzed by Revman5.1 software, by searching PubMed, Medline, VIP, Wan Fang and Chinese HowNet database 2006–2016 in traditional Chinese medicine treatment of children with adenoid literature.

Results 206 articles met the inclusion criteria, of which ten were selected and included in the meta-analysis, and there were 803 patients. The results showed that the remission rate of the Chinese medicine treatment group was better than that of the Western medicine group. The combined effect of the amount of OR 2.06, 95% Cl (1.45, 2.96) and the combined effect of the amount of the test $Z=4.12$, $P<0.00001$ showed the recurrence of the disease was lower in traditional Chinese medicine treatment group than the Western medicine group. The combined effect of the amount of OR 3.05, 95% Cl (2.11, 4.56) and the combined effect of the amount of the test $Z=5.86$, $P<0.00001$ showed the total effective rate is high in the traditional Chinese medicine treatment group than the Western medicine group. The difference between the combined effect of the amount of OR 2.79, 95% Cl (1.78, 5.03) and the combined effect of the amount of the test of $Z=4.54$, $P<0.00001$ was statistically significant, which showed the treatment effect of Chinese medicine group is obviously better than the Western medicine group.

Conclusion The use of Chinese medicine for the treatment of children with adenoid hypertrophy has good clinical efficacy.

Keywords Chinese medicine · Adenoid hypertrophy in children · Meta-analysis

Introduction

The adenoids are part of the pharyngeal lymphatic ring, located at the junction of the nasopharynx and the posterior wall, and have humoral immune function [1]. Adenoidal hypertrophy, that is, hyperplasia of the pharyngeal tonsils, in children is a normal physiological manifestation, and the adenoids reach the maximum level when the baby is 6 years of age. Adenoidal hypertrophy can be caused by influenza, rhinitis and sinusitis, and acute tonsillitis. It will lead to pathological adenoid enlargement often combining with chronic tonsillitis, and block of the eustachian tube causing otitis media which causes hearing loss and tinnitus, and even causes suppurative otitis media; at the same time, nasal congestion and nasal secretion retention can be caused by rhinitis, snoring, mouth breathing, and other symptoms, long before causing asymmetric facial growth in children [2]. Therefore, children with adenoid hypertrophy should not be underestimated; we must do an early detection and an early treatment.

In recent years, Chinese medicine for the treatment of adenoidal hypertrophy in children is widely used in clinical practice. To confirm the effectiveness and safety of Chinese medicine in the treatment of adenoidal hypertrophy in children this article collects the literature in the past 10 years, according to the requirements of Cochrane system evaluation, systematically evaluates the clinical efficacy of Chinese medicine in the treatment of adenoidal hypertrophy in children, and provides evidence for evidence-based medicine.

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Data and methods

Literature search and inclusion–exclusion criteria

English literature was searched in Medline and PubMed databases, and the literature in Chinese was searched in VIP, Wan Fang and China HowNet (CNKI) databases and all the traditional Chinese medicines for the treatment of adenoid hypertrophy from the literature published since 2006 were collected. The retrieval condition is as follows: in Chinese, the keywords were "Chinese medicine", "Chinese medicine", and "Pediatric adenoid hypertrophy"; in the English literature, the words include "traditional Chinese medical science", "traditional Chinese medicine", and "Adenoidal hypertrophy in children". Inclusion criteria: (1) the object of study: the clear diagnosis of adenoid hypertrophy; (2) methods: clinical randomized-controlled trials; (3) administration: the control group using the conventional Western medicine treatment, the treatment group treated by the traditional Chinese medicine. Exclusion criteria: (1) the subjects of the study include adult patients, (2) less than ten cases, (3) the exact Chinese medicine and traditional Chinese medicine theory did not explain in the literature, and (4) abstract data from conference and scarce literature.

Literature screening

According to the inclusion and exclusion criteria of literature screening, we initially retrieved 468 documents, read the titles and abstracts, and excluded 262 literature; 206 articles were further excluded as they did not meet the inclusion criteria; finally, ten articles were included for meta-analysis.

Methodological quality assessment of documentation

According to the Cochrane system evaluation method by two reviewers, for all randomized controlled trials (RCT) analyzing blind, randomized and follow-up of three parts, total score was 0–7: 1–3 is divided into low-quality research papers and 4–7 is divided into high-quality research. If the opinion does not agree, third parties were consulted to decide.

Statistical analysis

Statistical processing was done using RevMan5.3 software provided by Cochrane collaboration network for statistical purposes. If the test results are heterogeneous ($P < 0.05$), meta-analysis is performed using a random effect model; if the experimental results are not heterogeneous ($P > 0.05$), meta-analysis is performed using a fixed effect model. Counting data, the software recommends using the Peto ratio.

Results

Included in the study were ten basic cases of Chinese medicine for adenoid hypertrophy in children, results are shown in Table 1.

Table 1 The basic situation of ten cases of adenoid hypertrophy in children treated with Chinese medicine

Author	Particular year	Observation group		Control group		Score
		Number	Therapeutic intervention	Number	Contro-led intervention	
Chen [3]	2013	30	Tongqiao Sanjie decoction	30	Biyuanshu oral liquid	3
Zheng [4]	2010	30	Qingfei Sanjie decoction	30	Tongqiaobiyan tablet	2
Peng [5]	2014	48	Six Jun Xiao Luo decoction	32	Pidotimod dispersible tablets + mometasone furoate nasal spray	3
Jiang [6]	2016	40	Invigorating spleen to resolve dampness and dissipating stasis	30	Mometasone furoate nasal spray (Nasonex)	2
Zhao and Lei [7]	2017	33	Thunder fire moxibustion + Chinese medicine	33	Traditional Chinese medicine	1
Wang [8]	2017	120	Clear the nose and snore soup	40	Mometasone furoate + Biyuan Tongqiao granules	3
Liu [9]	2016	42	Self-made powder for eliminating prostate	42	Mometasone furoate nasal spray	3
Liao [10]	2009	30	Modified decoction of epiglottis and addiction	30	Mometasone furoate nasal spray	3
Zhu et al. [11]	2011	52	Shenling lavage fluid	51	Saline + gentamicin	3
Yu [12]	2015	30	Haizao Yuhu decoction combined with Fructus Xanthii decoction	30	Ketotifen	2

Funnel plots are drawn according to the data in the ten selected articles, as shown in Fig. 1, with OR (total effective number of the treatment group/control group total effective number) as abscissa, and the standard error (logarithm of OR) as ordinate. The graph shows that the graph is basically symmetrical, and the study is called normal distribution, which can be considered as no bias.

Comparison of symptom relief rate

The results are shown in Fig. 2. There are six articles on the treatment of adenoidal hypertrophy in Chinese medicine. The heterogeneity test, $P=0.75$, showed that the six literature data were homogeneous, so the fixed effect model was adopted. The combined effect of the amount of OR 2.06, 95% Cl (1.45, 2.96) and the combined effect of the amount of the $Z=4.12$ inspection, $P<0.00001$ indicated that the Chinese medicine alone or combined with Western treatment showed high remission rate than Western medicine in the treatment of children with adenoid hypertrophy symptoms.

Recurrence rate comparison

The results are shown in Fig. 3. There are five articles on the treatment of adenoidal hypertrophy in children with low recurrence rate after treatment. The heterogeneity test, $P=0.25$, showed that the five literature data were homogeneous, so the fixed effect model was adopted.

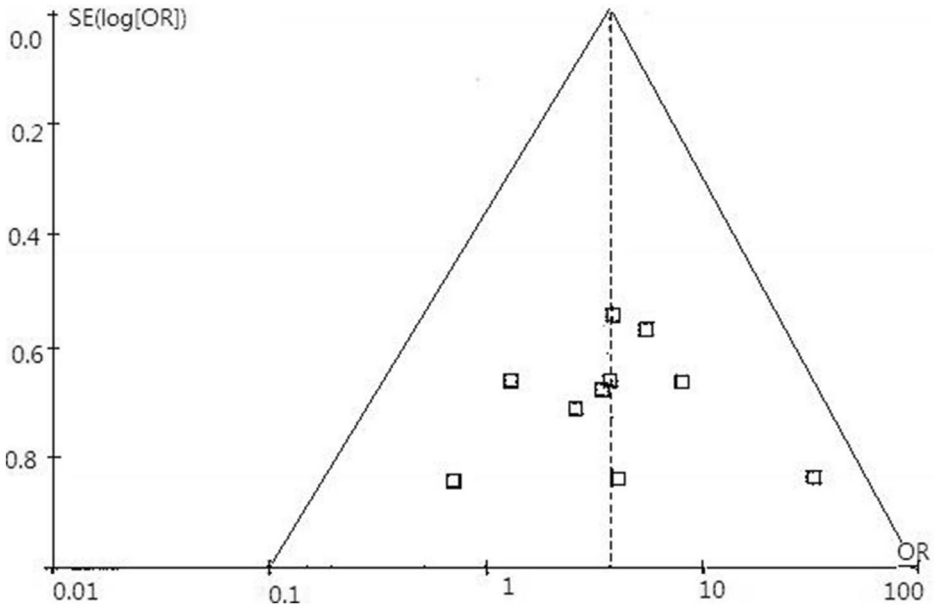

Fig. 1 Comparison of therapeutic effect between Chinese medicine observation group and control group

Review: 小儿腺样体肥大
Comparison:01 病灶
Outcome: 01 缓解率

Study or sub-category	中药观察组 n/N	对照组 n/N	Peto OR 95% Cl	Weight %	Peto OR 95% Cl
六君消瘰汤	13/48	6/32		7.54	1.52(0.40,3.52)
健脾化湿散结法	29/40	12/30		22.67	2.56(1.40,4.73)
清鼻止鼾汤	89/120	12/40		13.50	2.10(1.02,5.29)
自拟消腺散	26/42	14/42		19.53	2.38(1.12,3.75)
会厌逐瘀汤加味	21/30	7/30		10.25	1.32(0.40,3.60)
参苓灌洗液	39/52	16/51		26.51	2.72(1.29,5.67)
Total(95% Cl)	332	225		100	2.06(1.45,2.96)

Total events:217(中药观察组)，117(对照组)
Test for heterogeneity:chi=2.68,df=5(P=0.75)
Test for overall effect:Z=4.88(P<0.00001)

0.1 0.2 0.5 1 2 5 10
Favours treatment Favours control

Fig. 2 Comparison of remission rates of children with adenoidal hypertrophy treated with Chinese medicine and Western medicine

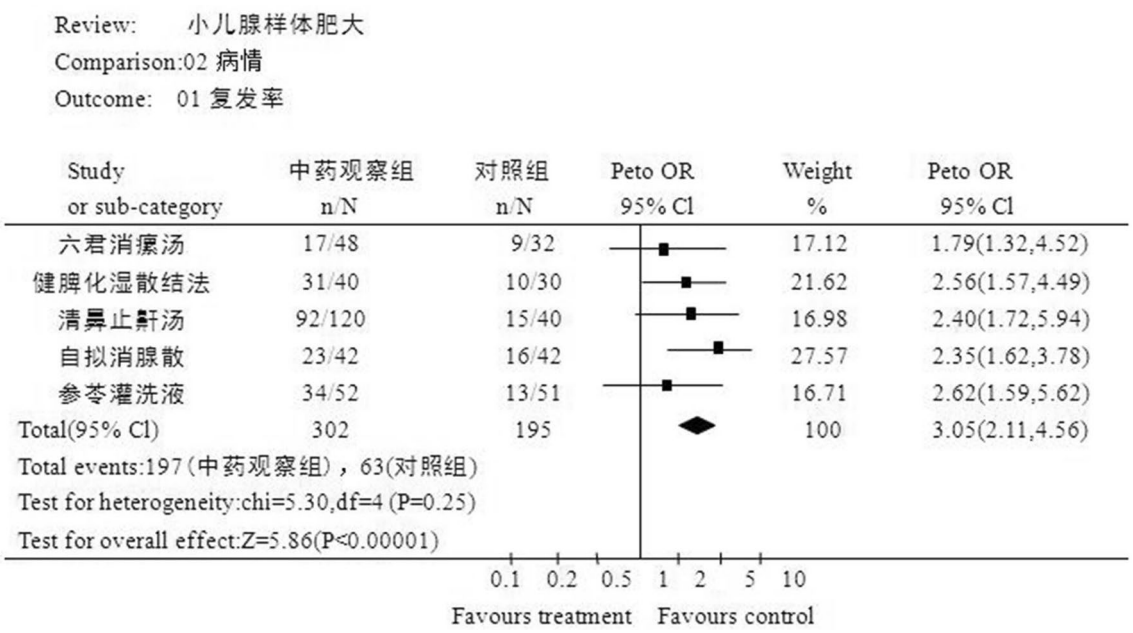

Fig. 3 Comparison of recurrence rates between Chinese medicine and Western medicine in the treatment of adenoidal hypertrophy in children

The combined effect of the amount of OR 3.05, 95% CI (2.11, 4.56) and the combined effect of the amount of the $Z = 5.86$ inspection, $P < 0.00001$, indicated that the Chinese medicine alone or combined with Western treatment than Western medicine treatment can effectively relieve the recurrence of adenoid hypertrophy in children.

The comparative analysis of the total effective rate of Chinese medicine is shown in Fig. 4.

Ten articles were included and a total of four articles were analyzed for total effectiveness. Among them, the total number of treatment for 407 cases included the treatment group of 244 cases, and the control group of 163 cases. The heterogeneity test $P = 0.65$ indicated that the four literature data

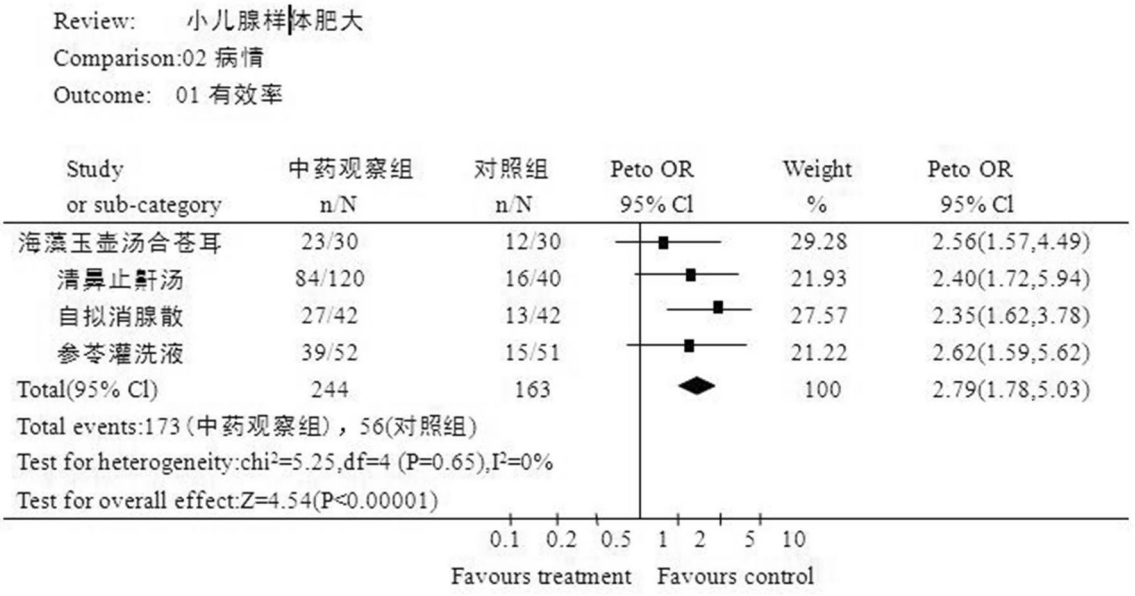

Fig. 4 Comparison of the effectiveness of traditional Chinese medicine and Western medicine in the treatment of adenoidal hypertrophy in children

were homogeneous, so the fixed effect model was used. The combined effect of amount, OR 2.79, 95% Cl (1.78, 5.03), and the combination effect of test, $Z = 4.54$, $P < 0.00001$ showed that Chinese medicine alone or in combination with Western medicine treatment is more effective than Western medicine in the treatment of adenoid hypertrophy in children.

Conclusion

The clinical manifestations of adenoid hypertrophy in children include nasal congestion, runny nose, sleep snoring, mouth breathing, and often can lead to obstruction of the eustachian tube, causing secretory otitis media. Parents often do not pay enough attention to children's nasal congestion, and children with ear stuffy, hearing loss and other tolerance, leading to parents ignoring hearing loss, once found to have been seriously affecting the hearing. Adenoidal hypertrophy can cause sleep apnea in children and repeated sleep-related airway obstruction often leads to hypoxemia and sleep disturbances. Studies have shown that patients with mild adenoidal sleep apnea caused by adenoidal hypertrophy also experience neurocognitive disturbances [13]. From the Chinese point of view, pediatric lung is often inadequate for lung and nasal orifices, throat pulmonary portal and the evil invasion, head of nasopharynx. Adenoidal hypertrophy is common in children. The most common clinical diseases include acute tonsillitis, acute rhinitis, and influenza.

At present, the Western treatment of children with adenoidal hypertrophy is mainly based on Western medicine, nasal spray and surgery. There is no clinical study for the time required for the use of Western medicine and related side effects. At the same time, long-term immunity after adenoidectomy remains. There was no significant decline in function, but it remained until 6 months [4]. In addition to the complications associated with the operation, there is no cause for the recurrence of the disease caused by various inducements. "Holistic view and clinical treatment" are the characteristics of traditional Chinese medicine. Chinese medicine for the treatment of adenoid hypertrophy in children cannot be limited to the adenoids, but to adjust the children's physique, that is, to avoid dependence on related hormones. The risk of surgery can also reduce the recurrence rate. In this study, the progress of research on the treatment of adenoidal hypertrophy in children at home and abroad has been proved by meta-analysis. The current research on the treatment of adenoidal hypertrophy in children abroad is almost none.

This study systematically evaluates the clinical efficacy by the traditional Chinese medicine and the traditional Chinese medicine theory for adenoid hypertrophy in children. Our results show that the different TCM prescriptions and methods for the significant effect of the treatment of adenoid hypertrophy may be a new option for non-surgical treatment. There has not been a consensus in the treatment method of the traditional Chinese medicine for the adenoid hypertrophy at home and abroad as the optimizing treatment and measurement and treatment details are not unified, these are yet to be carried out on large-scale long-term prospective clinical trials.

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Compliance with ethical standards

Conflict of interest The authors declare that they have no competing interest.

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