

# Analysis of the Current Status of Chinese Medicine Treatment of Chronic Sinusitis

Yun Chen<sup>1</sup>, Xiong Zhang<sup>2,\*</sup>

<sup>1</sup>Shaanxi University of Chinese Medicine, Xianyang, Shaanxi, 712046, China

<sup>2</sup>Affiliated Hospital of Shaanxi University of Chinese Medicine, Xianyang, Shaanxi, 712000, China

\*Correspondence Author

**Abstract:** *Chronic sinusitis, a common ENT disease, has a serious impact on the quality of life of patients. Chinese medicine has demonstrated unique efficacy and advantages in the treatment of chronic sinusitis. This article summarizes the etiology, clinical manifestations, and treatment of chronic sinusitis in Chinese medicine to provide reference for the treatment of chronic sinusitis.*

**Keywords:** Chronic sinusitis, Chinese medicine therapy, Dialectical treatment, Acupuncture therapy, Chinese medicine treatment.

## 1. Etiology of Chronic Sinusitis

CRS belongs to the category of nasal abyss in Chinese medicine, and the name of nasal abyss was first mentioned in the Nei Jing. The definition and pathogenesis of nasal abyss is clearly recorded in Suwen: "Gallbladder moves heat to the brain", pointing out the relationship between the upward disturbance of gallbladder heat and the onset of nasal abyss. Subsequent generations of medical practitioners have mostly added to and developed their understanding of nasal abyss on this basis. The Medical Alcohol Sensory Yee [1] suggests that the important pathogenetic mechanism of nasal abyss is fire-heat of the liver and gallbladder; it also suggests that wind, fire, and cold invasion are also important causes for the occurrence of nasal abyss. The Young Children's Integration: "Nasal discharge of turbid mucus is not stopping, called nasal abyss, which is caused by wind-heat in the brain". It is believed that wind-heat attack is the cause of nasal abyss. Plain Questions [2] describes: "When the water is not cold, the heat is great, ... .. and even enters the lungs, coughing and nasal abyss," emphasizing that lung heat is an important pathogenetic factor for nasal abyss. Since then, the pathogenesis of nasosinusitis has gradually been summarized as the excess heat of lung meridian, gallbladder, spleen and stomach, and the deficiency of lung and spleen. In the course of exploring the pathogenesis of CRS in traditional Chinese medicine, 'obstruction' and 'disobedience' have always been the key to pathogenesis. [3] National Higher Colleges and Universities of Traditional Chinese Medicine Planning Textbook (10th edition), Chinese Medicine Otolaryngology [4] classifies nasal abyss into five types: wind-heat in the lungs, gallbladder-heat, damp-heat in the spleen and stomach, lung-qi deficiency and cold, and spleen-qi weakness. Xiong Dajing [5] and others believe that bile viscera heat is the key to the pathogenesis of CRS, so the treatment should open the Xuanfu, and use more pungent and warm antidote to the epidermal drugs. Wang Jiale [6] and other research on Professor Zhou Ling's prescription of drugs, Professor Zhou Ling found that Professor Zhou Ling used more clearing lung heat, beneficial to support the correctness of the medicine for the treatment of CRS, Professor Zhou Ling believes that the onset of CRS is mostly related to the long period of time with the evil Qi is not resolved, away from the lung system, depressed and transformed into a fire, the evil Qi for a long time, the long term disease injuries related to the correctness

of the disease.

## 2. Clinical Manifestations and Differential Diagnosis of Chronic Sinusitis

CRS is a disease characterized by turbid nasal discharge in more than one volume, which may also be accompanied by nasal congestion, headache, and impaired sense of smell. The cloudy runny nose is unilateral or bilateral, the amount is large, can flow to the anterior nasal aperture, can also flow to the back of the pharynx, if accompanied by a bad smell, most of the odontogenic maxillary sinusitis. Nasal congestion is another major symptom of CRS and is most often caused by thickening of the mucous membranes of the sinuses and nasal passages, reactive swelling of the turbinates, nasal polyp formation, or excessive pus. Some patients may be accompanied by significant headaches, which are often confined to the root of the nose, forehead, jaw and top of the head with some regularity. In the former group of sinusitis, it mostly manifests as a boring pain in the forehead and the root of the nose; in the latter group of sinusitis, the headache and discomfort are in the forehead, occipital area or the top of the head, and sometimes muscle pain or pressure pain in the neck and shoulders can also occur. Olfactory disorders can be manifested as hyposmia, loss of smell or malodorous smell, mostly temporary symptoms, mostly caused by mucosal inflammatory lesions, nasal by inflammatory swelling of the mucous membrane of the cavity and polypoid lesions, or even the formation of nasal polyps, or due to excessive pus and so on.

The diagnosis of CRS is not difficult but needs to be differentiated from chronic rhinitis and allergic rhinitis. Both CRS and chronic rhinitis are characterized by nasal congestion and runny nose, but the primary symptom of chronic rhinitis is nasal congestion, the runny nose is mucous, and the runny nose is mostly bilateral. Turbinate swelling is predominantly in the inferior turbinate, with no pus in the middle nasal passage or olfactory fissure. In contrast, the mandatory symptom of CRS is a profuse pus-filled runny nose, with or without nasal congestion, and the runny nose may be mostly unilateral. Turbinate swelling is predominantly in the middle turbinate, with pus in the middle nasal passage and olfactory fissure. Both CRS and allergic rhinitis are characterized by profuse runny nose, but allergic rhinitis is a

profuse clear runny nose, often accompanied by continuous sneezing; CRS is a profuse pus-filled runny nose, mostly without sneezing.

### 3. Traditional Chinese Medicine (TCM) Internal Treatment

Chinese medicine internal treatment method focuses on the overall concept, dialectical treatment, and the treatment principles and medication programs for different types of evidence are focused on each other. It improves the body's immune function by regulating the body's balance of yin and yang and the operation of qi and blood. Liu Jing Dan [7] found that the efficacy of Yiqi Tongjiao Drink in the treatment of chronic rhinosinusitis of lung, spleen and qi deficiency type was remarkable, and the results of adding Yiqi Tongjiao Drink on top of budesonide nasal spray in the treatment of CRS showed that the total effective rate was 93.18%. The results showed that the total effective rate was 93.18%, which indicated that Yiqi Tongjiao Drink can effectively improve the inflammatory reaction of chronic rhinosinusitis patients, promote the discharge of turbid mucus, and improve the clinical efficacy of the treatment, which is an effective therapeutic means of intervening in chronic rhinosinusitis. Wang Xiaojuan [8] confirmed that the efficacy of Ginseng Ling Baijusan in treating chronic sinusitis with lung and spleen qi deficiency is remarkable, effectively improving the symptoms of nasal congestion, pus flow, dizziness, etc., and the time of symptom disappearance of the experimental group is shorter than that of the control group, with an effective rate of up to 96.92%. To summarize, the whole formula is a good formula for the treatment of chronic rhinosinusitis with lung and spleen qi deficiency, as it can promote the lung, strengthen the spleen and benefit the lung. Qi Tongfei [9] believe that nasal abyss is located in the nose and is closely related to the lungs, spleen and kidneys. CRS seen clinically is characterized by lung heat and yin deficiency. Treatment should be to clear lung heat and nourish lung yin, with the addition of nourishing yin and clearing lung soup. The total effective rate was 89.19% when eucalyptus-pinol enteric soft capsule was given in addition to Nourishing Yin and Clearing Lung Soup, and the total effective rate was 89.19%. The experiment showed that the combination of Nourishing Yin and Clearing Lung Soup and Eucalyptus-Pin Enteric Soft Capsule could enhance the ciliary clearance function of nasal mucosa, reduce the resistance of nasal airway, enhance the nasal function, and improve the clinical symptoms and signs of CRS. Xiong Jing [10] found that the clinical efficacy of gentian pills for the treatment of damp-heat chronic rhinosinusitis was significantly better than that of the conventional western medicine group, and that gentian pills could significantly improve patients' symptoms and serum inflammatory factor levels. Fan Zaiju [11] believes that clearing heat, detoxification, and promoting lungs are important treatments for CRS, and based on the conventional treatment with western medicines, Silver Flower Rhinitis Soup was taken orally, and the results confirmed that Silver Flower Rhinitis Soup could significantly improve the symptoms of pus flow, nasal passages, olfactory disorders, and headache, with an overall effective rate of 95.92%.

### 4. Traditional Chinese Medicine (TCM) External Treatment

#### 4.1 Acupuncture Therapy

Acupuncture therapy is a method of preventing and treating diseases by adjusting the meridians and qi and blood through stimulating acupuncture points with the use of millimetre needles under the guidance of Chinese medicine theories. Zhu Tianmin [12] concluded that acupuncture-oxygen therapy plays a therapeutic role in chronic rhinosinusitis by decreasing the mRNA expression of pro-inflammatory cytokines interleukin-8 (IL-8) and tumor necrosis factor-alpha (TNF- $\alpha$ ) in the sinus mucosa. Hu Hongfang [13] found that the combination of acupuncture treatment on the basis of western medicine treatment can significantly reduce the level of inflammatory factors and improve the ciliary transport function of nasal mucosa. Liu Fangfang [14] found that Qixin Tang combined with acupuncture therapy can significantly improve the efficacy of patients with chronic rhinosinusitis, improve the quality of life of patients, and reduce complications and recurrence rates. Wen Quan [15] and others found that acupuncture combined with Guanyuan moxibustion can reduce the content of MMP-2 and COX-2 in the nasal mucosa of mice, thus reducing the damage of inflammation to bone and sinus mucosa, and it has a significant effect on the bone repair of chronic rhinosinusitis in mice. Shang Jun [16] the use of acupuncture treatment of chronic sinusitis 60 cases, the results of the disappearance of symptoms 45 cases, 12 cases of symptomatic relief, ineffective 3 cases, the total effective rate of 95%, no adverse reactions and is not easy to recur.

#### 4.2 Moxibustion

Moxibustion is the use of moxa or other drugs on the surface of the body at the acupuncture points burning, warm ironing, through the heat of the moxibustion fire as well as the role of drugs, through the meridian conduction, in order to play the warmth of the qi and blood, to support the positive and eliminate the evil, in order to achieve the prevention and treatment of disease a kind of treatment metho. Li Dangui [17] divided 60 cases into two groups of 30 cases each according to the lottery method. Both groups were treated with conventional treatment, and the observation group was treated with thunder fire moxibustion combined with acupoints and manual massage on the basis of conventional treatment. The results of the observation group efficacy is much higher than the control group, indicating that the thunder fire moxibustion combined with acupoints and manipulative massage treatment can improve the clinical symptoms of chronic rhinosinusitis patients, improve the therapeutic efficacy, and there is no adverse reaction. Song Yun [18] used warm acupuncture to treat 68 cases of chronic rhinosinusitis, resulting in 32 cases (47.1%) cured, 21 cases (30.9%) with significant effect, 12 cases (17.6%) effective, 3 cases (4.4%) ineffective, with a total effective rate of 95.6%, which is a significant treatment effect. Chen Jian [19] found that the efficacy of Tongjiao Rhinitis Formula combined with warm acupuncture in the treatment of CRS was significant, which could improve the function of nasal cilia transmission and reduce the inflammatory response.

### 4.3 Nasal Rinsing

Nasal rinsing is to clean the nasal cavity and achieve the purpose of drug therapy through the contact of drug solution with the nasal mucosa, the operation is simple and easy to be tolerated by patients. Experiments have shown that nasal rinsing can promote secretion discharge, accelerate mucosal epithelial regeneration, improve sinus mucosal cilia function, promote wound cleaning, accelerate healing, reduce edema, and control vesicle and small polyp proliferation [20]. Wang Hui [21] et al. explored the application value of budesonide nasal spray combined with nasal rinsing in patients with chronic rhinosinusitis nasal polyps after surgery. Patients with chronic sinusitis nasal polyps who had undergone surgical treatment were divided into two groups, the control group was given budesonide nasal spray to spray the nose, and the experimental group added nasal rinsing on the basis of the control group. The results showed that the level of inflammatory factor was reduced in both groups after treatment, but the degree of reduction in the experimental group was much greater than that in the control group, and the occurrence of adverse reactions in the experimental group was lower than that in the control group, and the effective rate of the observation group (98.48) was much higher than that of the control group (86.57). The combination of budesonide nasal spray and nasal rinsing can effectively improve the function of the nasal cavity, reduce the inflammatory reaction, and promote the recovery. Zhang Fangfang [22] divided 84 patients with chronic sinusitis who had received surgical treatment into 2 groups of 42 cases each. The control group was given postoperative routine care group, and the observation group added nasal rinsing on the basis of postoperative routine care. The results of nasal rinsing group nasal mucosa cilia transmission rate increased significantly, the patient before and after the care of the degree of pain scores decreased and the experimental group is much lower than the control group, the observation group complication rate is far below the experimental group.

### 4.4 Chinese Medicine Fumigation

Chinese medicine fumigation refers to a kind of chemical and physical integrated therapy with hot medicine steam as the therapeutic factor, which is to mix Chinese herbs with water and boil them, and use the steam of the mixture to fumigate the patient's body to achieve the therapeutic purpose. This method has been recorded in the pre-Qin period in China, and has matured in the Qing Dynasty. Chinese medicine fumigation is fast-acting and has the effect of activating blood circulation, removing blood stasis, dredging meridians and detoxification. Wu Qiaolian [23] showed that the effect of herbal fumigation in the treatment of lung qi deficiency and cold type chronic sinusitis after surgery was more significant than that of postoperative routine care alone. The efficacy of Cang Er Zi San fumigation in the treatment of chronic postoperative sinusitis of the lung qi deficiency and cold type is exact, inhibiting inflammatory reactions and improving the quality of life of patients. Li Dong [24] divided patients with chronic rhinosinusitis into two groups, the control group was treated with conventional western medicine, and the observation group was treated with traditional Chinese medicine fumigation of Xuanlong Tongjiao Tang. The results showed that the addition of traditional Chinese medicine

fumigation to the conventional treatment could significantly improve the clinical efficacy, both in terms of the comparison of Chinese medicine symptom scores and the comparison of inflammatory factor levels.

### 4.5 Negative Pressure Displacement

Negative pressure replacement therapy for sinus is to pump out the air in the sinus with intermittent suction method to form negative pressure in the sinus cavity, and when the suction is stopped, under the effect of atmospheric pressure, the medication drops into the nasal cavity can flow into the sinus cavity through the sinus orifice to reach the inflammation area, so as to achieve the therapeutic purpose [25]. Negative pressure sinus replacement method is used to treat pediatric sinusitis with remarkable effect. Compared with adults, children's sinus mucosa is fragile and the sinus opening is large, which is easy to produce a large amount of secretion and inflammatory reaction, surgical treatment will affect the children's late nasal development, and drug treatment is not only a long period of time and difficult to drip the medicine into the nasal cavity. Negative pressure sinus replacement combined with antibiotic regimen can effectively remedy these problems [26]. Zhou Juan [27] divided pediatric chronic sinusitis patients into conventional treatment group and negative pressure sinus replacement group for efficacy comparison, the results of the two groups before and after the treatment of the degree of pain and sinus CT scores comparison show that negative pressure sinus replacement treatment of pediatric chronic sinusitis effect is remarkable. Negative pressure sinus replacement can relieve patients' pain and improve clinical efficacy. Ma Shuangzhi [28] use of negative pressure sinus replacement therapy for the treatment of chronic sinusitis 102 cases, the results of the cure 70 (68%), 30 cases of improvement (30%), the effect is not obvious 2 cases (2%), the efficiency is 98%. Negative pressure sinus replacement therapy for the treatment of chronic sinusitis can reduce the pain of patients, improve the efficacy of treatment, and reduce adverse reactions.

### 4.6 Ultrasonic Atomization of Traditional Chinese Medicine

Ultrasonic nebulization of traditional Chinese medicine is the use of ultrasound in the drug solution produced by the role of ultrasound, so that the drug was particulate mist gas to reach the lesion directly to play a therapeutic effect, ultrasonic nebulization of inhalation, easy to operate, effective, painless, no side effects [29]. Chen Yanchun [30] found that Chinese herbal medicine by ultrasonic nebulized inhalation anti-inflammatory and anti-allergic effect is obvious, no adverse reactions, no irritation of the nasal mucosa, reduce chronic sinusitis postoperative surgery nasal mucosal edema. Wang Zhenpeng [31] found that the efficacy of ultrasonic nebulization inhalation of traditional Chinese medicine in the treatment of chronic sinusitis in children is accurate, both moisturizing and protecting the mucosa of the nasal cavity, with no side effects, convenient and easy to implement.

## 5. Reflections on the Treatment of CRS

Western medicine believes that CRS is mainly caused by incomplete treatment of acute sinusitis to the extent that it is

recurrent and prolonged. At the same time, diseases and factors that hinder the ventilation and drainage of the nasal cavity and sinuses, such as nasal polyps, hypertrophy of the turbinates, nasal solidity, nasal tumors, deviated nasal septum, nasal cavity stuffing, etc., are the main reasons for the occurrence of CRS. CRS is the result of a combination of factors such as anatomical variants of the sinuses, mucosal cilia movement disorders, disorganization of the sinus microflora, immunodeficiency, and environmental pollution [32]. Zixin Zhu [33] concluded that interleukins, epigenetics, and microbiota, especially *Staphylococcus aureus*, are closely associated with the progression of CRS. Chinese medicine believes that the occurrence of CRS is mainly in the lungs, the lungs open the orifices in the nose, at the same time with the stomach, gallbladder, spleen and other visceral dysfunction is closely related. Disease mechanism has deficiency and solid, the deficiency evidence is mostly based on lung qi deficiency, spleen qi deficiency, and the solid evidence is mostly based on wind-heat in the lung meridian, depressed heat in the gallbladder, and damp-heat in the spleen and stomach. Western medicine treats CRS mainly with antibiotics, vasoconstrictors, and surgery. CRS has a long course and is prone to recurrent episodes. Prolonged use of antibiotics can result in adverse effects such as liver and kidney damage, development of drug resistance, and even more serious infections. Vasoconstrictor nasal spray or drops into the nose can improve nasal ventilation and promote sinus drainage. Winning in convenience and faster symptom relief, but long-term use will lead to long-term vasoconstriction of blood vessels in the nasal cavity, causing proliferation of local nasal mucosal tissue changes, which in turn leads to the occurrence of drug rhinitis, so that nasal congestion is more serious. It also destroys the normal physiological function of the nasal mucosa, leading to nasal dryness, mucosal erosion, and even inducing nosebleeds. Prolonged use will also lead to dizziness, headache, insomnia and other uncomfortable symptoms. Surgical treatment, the symptoms may be improved, but easy to cause mucosal edema and adhesion. It is also susceptible to recurrence due to external influences such as climate and emotions. Surgery is not usually performed on minors. Chinese medicine treatment can be dialectic, add and subtract according to the evidence, and formulate individualized treatment plans according to the condition. By regulating the balance of yin and yang and the operation of qi and blood in the human body, it not only relieves the local symptoms, but also strengthens one's own immunity and reduces the recurrence of the disease fundamentally. In addition, Chinese medicine is easy to take, long-lasting, inexpensive, without adverse reactions and toxic effects of drugs, reducing the pain of patients. At the same time with the external treatment method of Chinese medicine, can significantly improve the clinical efficacy.

## 6. Summary

Chinese medicine has unique advantages and efficacy in the treatment of chronic sinusitis, which can significantly improve the clinical symptoms and quality of life of patients through evidence-based treatment and holistic regulation. In recent years, clinical studies on the treatment of chronic sinusitis with Chinese medicine have gradually increased and achieved fruitful results. A number of studies have shown that TCM has significant efficacy and safety in the treatment of

chronic sinusitis. However, there are still problems such as non-uniform identification and typing and small sample size of clinical research. In the future, we should further standardize the identification and typing criteria for the treatment of chronic rhinosinusitis with Chinese medicine, increase the efforts of clinical research, explore more effective treatments, and formulate more comprehensive Chinese medicine treatment protocols and guidelines. At the same time, it is also necessary to strengthen the combination and cooperation between TCM and modern medicine to jointly promote the treatment and research of chronic rhinosinusitis to a higher level.

## References

- [1] Xiong Dajing. Practical Chinese Medicine Otorhinolaryngology and Orofacial Science [M], Shanghai: Shanghai Science and Technology Press, 2001, First Edition: 214.
- [2] Xia Ji Yan. Recognition of fuchus in ancient medicine [J]. Zhongguo zhongxi medical union otorhinopharyngology miscellany, 1999(02): 101-1
- [3] YANG Xiaoqian, ZHU Zhenhua. Pathogenesis of Chronic Sinusitis in Traditional Chinese Medicine[J]. GUANGMING JOURNAL OF CHINESE MEDICINE, 2024, 39(12):2368-2370.
- [4] Liu Peng. Chinese otolaryngology [M]. Beijing: China Traditional Chinese Medicine Publishing House, 2016: 128-131.
- [5] Liu Zifeng, Guo Tao, Xie Hui; Xiong Dajing. Data Mining of Prescription Patterns for Chronic Sinusitis by Professor Xiong Dajing [J]. Journal of Chengdu University of Traditional Chinese Medicine, 2023, 46(05):9-13.
- [6] WANG Jiale, ZHOU Ling, WANG Yangyang, LIU Jingdan. Analysis on ZHOU Ling's Medication Rule and Mechanism of Core Prescription in the Treatment of Chronic Rhinosinusitis [J]. Guiding Journal of Traditional Chinese Medicine and Pharmacy, 2024, 30(08):128-136+164.
- [7] LIU Jingdan, XIE Liangzhen, HAN Delu, et al. Clinical efficacy of Yiqi Tongjiao Drink in treating chronic sinusitis with lung and spleen qi deficiency[J]. Chinese Materia Medica, 2024, (05):1287-1291.
- [8] Wang Xiaojuan. Effect of Modified Shenlingbaizhu Powder in Treating Chronic Sinusitis with Deficiency of Lung-spleen Qi and Evaluation on Improvement of Patients' Clinical Symptoms[J]. Chinese Medical Digest (Otorhinolaryngology), 2021, 36(06):72-73+76.
- [9] QI Tongfei, MA Zhuangzhuang, HUANG Junwei, ZHU Zhenhua. Clinical Study on Yangyin Qingfei Decoction Combined with Eucalyptol Limonene Pinene Enteric Soft Capsules on Chronic Rhinosinusitis with Yin Deficiency and Internal Heat Syndrome[J]. Chinese Journal of Information on Traditional Chinese Medicine, 2021, 28(12):93-97.
- [10] Xiong Jing, Zhouzhengfeng, Wu Ting. Clinical Study of the Anti-inflammation of Longdan Tongqiao Pills on Patients with Damp Heat Type Chronic Nasosinusitis[J]. Journal of Hunan University of Chinese Medicine, 2016, 36(12):34-36.

- [11] Fan Zaiju, Yu Qian, Li Min. Analysis of clinical effect of Yinhuo Tongqiao Rhinitis Decoction on chronic sinusitis [J]. Chinese Medical Digest (Otorhinolaryngology), 2024,39(03):69-71.
- [12] Zhu Tianmin, Lv Pin, Li Hui. Experimental study on the effects of acupuncture-oxygen therapy on IL-8 and TNF- $\alpha$  in rabbit model of chronic rhinitis and sinusitis[J]. Liao Ning Chinese Medicine Journal, 2011, 38 (7): 1323-1325.
- [13] Hu Hongfang. Clinical effect of acupuncture on chronic sinusitis[J]. Clinical effect of acupuncture on chronic sinusitis, 2019,25(24):129-131.
- [14] Liu Fangfang, Peng Tao, Xiong Yahui. Study on the effect of qi xin tang and acupuncture therapy to improve the quality of life of patients with chronic sinusitis [J]. Journal of Sichuan of Traditional Chinese Medicine, 2019,37(06):167-169.
- [15] Wen Quan. Effect of acupuncture combined with guanyuan moxibustion on bone repair in chronic sinusitis in mice[D]. Chengdu University of Traditional Chinese Medicine,2014.
- [16] Shang Jun. Acupuncture treatment of chronic sinusitis in 60 cases [J]. Journal of World of Traditional Chinese Medicine,2011,6(01):55.
- [17] Li Dan Gui. Thunder fire moxibustion combined with acupoints and manipulative massage for the treatment of chronic sinusitis in children: observations on the therapeutic effect [J]. Journal of Practical Traditional Chinese Medicine,2022,38(08):1366-1367.
- [18] Song Yun. Warm acupuncture and moxibustion for the treatment of chronic sinusitis in 68 cases[C]// Chinese Acupuncture and Moxibustion Society Auricular Points and Acupoints Specialized Committee, Chinese Acupuncture and Moxibustion Society. Proceedings of the National Symposium of the Chinese Acupuncture and Moxibustion Association Auricular Points and Acupoints Committee. Changsha County Second People's Hospital,; 2006: 2. Translated with www.DeepL.com/Translator (free version)
- [19] Chen Jian. Study on the effect of Tongkou Rhinitis Formula combined with warm acupuncture on nasal cilia transport function and serum inflammatory factor in the treatment of chronic rhinosinusitis. [J]. Journal of Practical Traditional Chinese Medicine, 2022, 38(02): 196-198.
- [20] Xu Geng, Li Yuan, Xie Minqiang. Staging of mucous membrane outcome in operative cavity after functional endoscopic sinus surgery [J]. Chinese Journal of Otorhinolaryngology, 1999, (05):45-48.
- [21] WANG Hui, ZHANG Yan, CHU Jun-Cai. Application Value of Budesonide Nasal Spray combined with Nasal Irrigation in Postoperative Patients with Chronic Sinusitis and Nasal Polyps [J]. China Journal of Pharmaceutical Economics,2024,19(07):85-88.
- [22] Zhang FF. Application effect of nasal rinse care in postoperative care of patients undergoing functional endoscopic sinus surgery[J]. Modern Health Care, 2024, 24(04):298-300.
- [23] WU Qiaolian, HUANG Aihua, WANG Mei, HUANG Yangzhou. Cangerzi Powder Fumigation in the Treatment of Chronic Sinusitis of Lung Qi Deficiency Cold Type after Operation [J]. GUANGMING JOURNAL OF CHINESE MEDICINE, 2024, 39(11): 2129-2132.
- [24] LI Dong. Effects of Xuanfei Tongqiao decoction combined with traditional Chinese medicine fumigation in treatment of patients with chronic sinusitis of lung-qi deficiency cold pattern [J]. Medical Journal of Chinese People's Health, 2023, 35(24):105-107.
- [25] Zhao Chunhong, Zhu Songzhou, Wang Guoqiang. Analysis of the results of 1560 cases of chronic sinusitis in children treated by pressure replacement method [J]. Chinese community physicians (medical specialty), 2013, 15(05):171-172.
- [26] Li Shuying. Clinical analysis of negative pressure replacement method for the treatment of chronic sinusitis in children[J]. World Digest of Recent Medical Information,2019,19(36):76+88.
- [27] ZHOU Juan, LIU Jinbin. Analysis of the effect of applying sinus negative pressure replacement method in the treatment of pediatric chronic sinusitis[J]. Research on trace elements and health,2020,37(04):33-34.
- [28] Ma Shuangzhi. The efficacy of negative pressure sinus replacement therapy in the treatment of chronic sinusitis [J]. Medicine and Pharmacy of Yunnan, 2014, 35(02): 245-246.
- [29] Su Yingdong, Zhu Yanqiong. Herbal Nebulization for Chronic Sinusitis [J]. Hubei Journal of Traditional Chinese Medicine,2012,34(02):40.
- [30] Chen Yanchun, Chen Zhiling, Yin Wenhua. Clinical observation on 58 cases of postoperative chronic sinusitis treated with Chinese medicine nebulized inhalation[J]. Zhejiang Journal of Traditional Chinese Medicine,2012,47(03):174.
- [31] Wang Zhenpeng. Chinese medicine nebulization treatment of 50 cases of chronic rhinosinusitis in children[J]. Chinese medicine research, 2014, 27(5): 29-30.
- [32] HU Shou-Liang, LI Hui, ZHU Tian-Min, et al. Progress in the study of etiology and pathogenesis of chronic rhinosinusitis[J]. Journal of practical medicine, 2019, 35(11):1846-1849.
- [33] ZHU Zi-Xin, JIANG Li-Zhu. Progress in the study of the pathogenesis of chronic rhinosinusitis[J]. Chemistry of Life, 2024,44(11):2067-2072.