



The treatment of gastroesophageal reflux cough with lung-spleen theory

Qing Yuan¹, Zong-Xue Zhang¹, You-Ran Lu¹, Jian Liu¹, Shang-De Guo²

¹Department of Respiratory medicine, Beijing Tradition Chinese Medicine Hospital Affiliated to Capital Medical University, Beijing 100010, China;

²Medical School, Shanxi Datong University, Datong 037000, China

Contributions: (I) Conception and design: Q Yuan; (II) Administrative support: None; (III) Provision of study materials or patients: Q Yuan; (IV) Collection and assembly of data: ZX Zhang; (V) Data analysis and interpretation: YR Lu; (VI) Manuscript writing: All authors; (VII) Final approval of manuscript: All authors.

Correspondence to: Qing Yuan. Department of Respiratory medicine, Beijing Tradition Chinese Medicine Hospital Affiliated to Capital Medical University, Beijing 100010, China. Email: 13366368367@189.cn.

Abstract: Chronic cough is one of the most common diseases of the respiratory system. It refers to the unexplained chronic cough in which cough is the only or cardinal symptom in clinically, lasting for more than 8 weeks, chest physical examination and chest X-ray chest film without obvious lesions. As it has been reported, gastroesophageal reflux cough (GERC) accounts for about 10% to 40% causes of chronic cough. Patients with GERC only have respiratory symptoms but no obvious gastrointestinal symptoms, so this kind of cough is ignored by patients and doctors easily, and resulting in missed diagnosis. In recent years, traditional Chinese medicine (TCM) has made some achievements in the etiology, disease mechanism, formulas, medicinals and therapy of GERC. Especially the pattern differentiation and treatment of GERC has become mature gradually. In this article we discussed the treatment of GERC cough with lung-spleen theory mainly.

Keywords: Chronic cough; gastroesophageal reflux cough (GERC); traditional Chinese medicine (TCM); lung-spleen theory

Received: 15 May 2019; Accepted: 12 June 2019; Published: 25 June 2019.

doi: 10.21037/lcm.2019.06.01

View this article at: <http://dx.doi.org/10.21037/lcm.2019.06.01>

Introduction

Chronic cough is one of the most common diseases of the respiratory system. It refers to the unexplained chronic cough in which cough is the only or cardinal symptom in clinically, lasting for more than 8 weeks, chest physical examination and chest X-ray chest film without obvious lesions. Chronic cough includes upper airway cough syndrome (UACS), cough variant asthma (CVA), eosinophilic bronchitis (EB) and gastroesophageal reflux cough (GERC). These account for 70% to 95% of the causes of chronic cough in the outpatient of respiratory medicine department, and GERC accounts for about 10% to 40% (1). UACS, CVA and EB are easy to diagnosis, not merely because they are all respiratory related diseases,

but they often accompanied by other respiratory related symptoms. On the contrary, patients with GERC only have respiratory symptoms but no obvious gastrointestinal symptoms, so this kind of cough is ignored by patients and doctors easily, and resulting in missed diagnosis.

The understanding of gastroesophageal reflux cough in modern medicine

Modern medicine has found the pathogenesis of GERC through the research of anatomy, pathology and physiology, including the following three aspects:

- (I) Local stimulation. In the absence of aspiration, cough is caused by stimulating the afferent

branches of cough reflex through stimulating laryngopharyngeal local mucosa;

- (II) Inhalation stimulation. Cough is caused by the inhalational refluxed gastric contents stimulating the lower respiratory tract (microaspiration can lead to pharyngitis and bronchitis; a large amount of aspiration can lead to aspiration pneumonia, pulmonary fibrosis and bronchiectasis, etc.);
- (III) Nerve reflex. Chronic cough is caused by stimulating cough reflex of esophageal and bronchial. Refluxed intragastric acid digestive juice in lower esophagus stimulates respiratory tract vagus nerve and causes smooth muscles spasm leading to asthma-like symptom (2).

Because of the few concomitant symptoms, no abnormal chest X-ray and no specificity in the terms of clinical manifestations and duration compared with chronic cough caused by other reasons, GERC is easy to be ignored by clinicians and treated by various antitussive repeatedly without any curative effects.

The understanding of gastroesophageal reflux cough in traditional Chinese medicine (TCM)

Cough is one of the main syndromes in pulmonary system disease, which refers to when the qi of the lung fails to decent, resulting in a cough. This is due to the lung failing to diffuse and manage the decent of the lung, leading to the cough. The main pathomechanism of cough is pathogenic qi attack lungs, ascending counterflow of lung qi. The main pathological changes of zang are lungs, related to liver and spleen, and involving kidney if the cough is longstanding (3). However, *Basic Questions Discussion on Cough* pointed out that “The five zang organs and the six fu organs all can lead to cough, not only the lung,” “All these kinds of cough are caused by accumulation of Xieqi in the stomach and are related to the lung.” “Stomach-cough is characterized by cough and vomiting.” “When people have eaten cold food, cold enters the stomach with the food and moves into the lung along the lung Channel. Hence, the cold Xie from the external and internal mixes up in the lung, resulting in lung-cough.” So, cough is also related to stomach.

The lung is closely related to spleen and stomach, which is mainly manifested in the following two aspects:

- (I) The physiologically interrelated between lungs and stomach. The lungs above the diaphragm and the stomach below the diaphragm. Throat is the portal of breathing gas exiting and entering

the lungs, as well as the necessary way for food to enter the stomach. The exogenous pathogenic factors can invade the lungs and stomach through throat simultaneously. The lungs and stomach are interconnected by channels and collaterals. Spleen meridian and stomach meridian being exteriorly-interiorly related, the lungs and spleen belong to taiyin, and the meridians of the same name are connected with each other by channel qi, which becomes the theoretical basis of the intercoordination between the lungs and the stomach during the ascending and descending of qi. Therefore, stomach meridians of foot-yangming serve as the channel for the 12 meridians that effect the rise and decline of yangming which allows for managing the ups and downs of lung channel qi directly.

- (II) The interaction between lungs and stomach on pathology. The spleen and stomach are the pivot of the ascending and descending of qi activity. And the lungs channel originates from the Middle-jiao. If the ascending and descending of qi activity of the spleen and stomach disorder or stagnate, there will be adverse effects on the function of lung governing management, regulation and the diffuse and govern descent of lung qi. In this way, the syndrome of lung qi stagnation and disseminating and descending disorder will appear. “The skin and hair are associated with the lungs. So, when pathogenic qi has attacked the skin and hair, it enters the lungs, when people have eaten cold food, cold enters the stomach with food and moves into the lungs along the lung channel. Hence, cold Xie from the external and internal mixes up in the lungs, resulting in lung-cough.” *Basic Questions Discussion on Cough* point out that cough attributed to lung’s own disease. The lungs and stomach cold combine with the exogenous pathogenic factor is the pathogenesis of cough. “All these kinds of cough are caused by accumulation of Xieqi in the stomach and are related to the lung” stresses that this kind of cough is related with the lung and the stomach.

The application of the spleen-lung theory in the treatment of GERC

According to the relevant theory of lung-stomach, modern

doctors classify cough by patterning differentiation syndrome. "Observing the pulse and syndrome, knowing the wrong place, treating with the syndrome." Following the thought of spleen-lung's theory, Modern doctors take the principle of harmonizing the stomach, regulating qi and strengthening the spleen as the basic principles to make prescription. To be specific, it includes:

- (I) Acrid medicinals open and bitter medicinals promote descent, combination of cold and warm medicinals *Case Records as a Guide to Clinical Practice* said: "Acrid can unblock yang, bitter can raise and direct turbid downward. Bitter-cold can clear heat and eliminate dampness, while acrid can open qi and remove turbidity." It used the addition and subtraction of the Pinellia Heart-Draining Decoction to mediate the qi of middle-jiao, and recover the normal function of spleen-ascending and stomach-descending by keeping a balance between cold and heat and using acrid medicinals open and bitter medicinals promote descent. Xiao and Luo selected 80 patients with gastroesophageal reflux cough as the object of study (4). The control group took omeprazole and domperidone while the experimental group was treated with Pinellia Heart-Draining Decoction addition and subtraction combining with cupping. The results showed that the total effective rate of experimental group preceded the control group, with statistically significant difference ($P < 0.05$).
- (II) Lung purification and stomach regulation, direct counterflow downward relieve cough and calm panting. From the related perspective of lung-stomach, GERD corresponds with the pathogenesis features of qi counterflow due to stomach deficiency. So, Inula and Hematite Decoction addition and subtraction can be used as the basic formula of harmonizing the stomach and directing counterflow downward to treat GERD. Modern pharmacological study showed that (5) Inula and Hematite Decoction obviously improve pH in lower esophagus mucosa, promoting the recovery of the disease, enhancing the function of gastrointestinal motility, speeding up gastric emptying and enhancing the contraction of smooth muscles in rats. Yan *et al.* treated 30 cases of GERD by self-made modified Inula and Hematite Decoction. Comparing with 30 cases of western medicine group, the results showed that the

curative effect of the treatment group is better than that of the control group ($P < 0.05$) (6).

- (III) Bank up earth to generate metal, dissolve phlegm and relieve cough. *Wondrous Lantern for Peering into the Origin and Development of Miscellaneous Diseases-Cough and Asthma* said: "The cough belongs to lung disease. Although it is mainly caused by lung lesion, the five zang organs and six fu organs all can lead to cough. It wouldn't cough without lung disease, it wouldn't cough for a long time without spleen disease, and it wouldn't coughed severely without kidney disease and excessive heat." Thus, it can be seen that spleen-deficiency can also cause cough. To cure the cough of spleen deficiency, many doctors prefer to use Six Gentlemen Decoction as a basic formula to add and subtract. With the method of fortifying the spleen and boosting qi, Li and Cao treated 30 cases of GERD with self-made formula Six Gentlemen Decoction plus bitter orange and platycodon and the result showed total effective rate is 90% (7).

Conclusions

In recent years, TCM has made some achievements in the etiology, disease mechanism, formulas, medicinals and therapy of GERD. Especially the pattern differentiation and treatment of GERD has become mature gradually. According to the related etiology and pathogenesis of lung-stomach and follow the thought of spleen-lung theory, later generations use empirical and self-made formula to treat chronic cough from the aspect of lung-stomach, making a great achievement. Thus, it can be seen, the thought of lung-stomach theory to treat chronic cough is worthy of clinical reference and consideration.

Case records 1

Patient Wang is a 76-year-old male peasant and his first visit was on May 30th, 2017. He has been coughing repeatedly for more than 1 month. During that time, he took antibiotics and various TCM, but the effect was poor. Today, he comes to the clinic.

Present illness: cough after getting a cold or a heat. The phlegm's quality is small, white, stick, and difficult to go out. His throat is dry. The place behind his sternum is firing. The stomach is scorching hot either. He has always been hiccuped, and distention and fullness. Most of time, he

feels uncomfortable in his stomach. Reddened tongue with slightly thick and yellow fur, slightly rapid pulse.

TCM diagnosis: cough.

Type of syndrome: union of dampness and heat.

Therapeutic principle: descending was administered to prolonged syndrome of stuffiness and fullness.

Prescription: pinellia rhizome in ginger juice 12 g, scutellaria root 10 g, coptis rhizome 6 g, medicinal evodia fruit 4 g, immature bitter orange 15 g, prepared cuttlebone 15 g, dried arc shell 15 g, inula flower (wrap-boiling) 10 g, common coltsfoot flower 15 g, Tatarian aster root 15 g, thunberg fritillary bulb 12 g, licorice root 6 g. Seven doses, 1 dose per day, divided into 2 times a day.

The patient came for further consultation on June 7, 2016. He said that after taking the decoction, coughing has been relieved obviously. The burning sensation which behind the sternum and inside the stomach and the fullness of gastric cavity also have been alleviated. Dry stool. Reddened tongue with slightly thick and white fur, moderate pulse. The doctor followed the previous treatment successively.

Prescription: ginger processed pinellia 12 g, immature orange fruit 10 g, Baikal skullcap root 10 g, coptis chinensis 4 g, evodia fructus 6 g, making cuttlebone 15 g, calcined concha arcae 15 g, areca catechu 12 g, Zhejiang fritillary 12 g, glycyrrhiza 6 g.

All the symptoms were cured by 7 doses. A telephone follow-up 2 weeks showed no recurrence.

Case records 2

Patient Li is a 30-year-old male office clerk, his first visit was on April 8, 2018. The chief complaint was repeated cough for more than two months, cough is almost always acute at night, rarely attack during the day, aggravation after meal, less phlegm, no fever. He didn't have fever, sneeze, running nose, nasal obstruction and other symptoms, with hypohidrosis, occasional acid regurgitation and eructation, and upper abdominal pain sometimes. He had normal appetite and a habit of eating before bedtime. He likes carbonated drinks in normal times. The stools and urine were normal. He had reddened tongue with white thin fur. When it comes to the auxiliary examination, the chest X-ray indicated no abnormality and the gastroscopie did a month ago prompts esophageal hyperplasia and bile regurgitation.

TCM diagnosis: cough.

Type of syndrome: belong to lung and stomach

disharmony.

Therapeutic principle: regulating stomach ascending qi, relieving cough and eliminate phlegm.

Prescription: modified Tangerine Peel and Bamboo Shavings Decoction.

Prescription: aged tangerine peel 15 g, bamboo shavings 9 g, tangshen 15g, atractylodes rhizome 9 g, liquorice root 6 g, platycodon root 5 g, hogfennel root 5 g, loquat leaf 6 g, Baikal skullcap root 10 g, common jujube fruit 10 g. There doses decocting, 1 dose per day. Patient should take a dose of medicine in 3 times a day. Do not eat food or drink carbonated beverage within 2 h before going to bed, and raise the head of bed slightly.

Second diagnosis on April 11, 2018. He said that the frequency of cough at night was significantly lower than before, acid regurgitation, hiccup was relieved obviously. But still mildly cough with a little sputum.

Exchange the front prescription by declining aged tangerine peel to 10 g and taking out Scutellaria root. 5 doses decocting, 1 dose per day, divided into 3 times a day. A telephone follow-up 2 weeks showed no recurrence.

Acknowledgments

Funding: This article was supported by Beijing Municipal Administration of Hospitals Incubating Program (Code: PZ2019026).

Footnote

Provenance and Peer Review: This article was commissioned by the Guest Editor (Bo Li) for the series "Holistic Traditional Chinese Medicine: the synergy of spleen and stomach in health" published in *Longhua Chinese Medicine*. The article has undergone external peer review.

Conflicts of Interest: All authors have completed the ICMJE uniform disclosure form (available at <http://dx.doi.org/10.21037/lcm.2019.06.01>). The series "Holistic Traditional Chinese Medicine: the synergy of spleen and stomach in health" was commissioned by the editorial office without any funding or sponsorship. The authors have no other conflicts of interest to declare.

Ethical Statement: The authors are accountable for all aspects of the work in ensuring that questions related to the accuracy or integrity of any part of the work are

appropriately investigated and resolved.

Open Access Statement: This is an Open Access article distributed in accordance with the Creative Commons Attribution-NonCommercial-NoDerivs 4.0 International License (CC BY-NC-ND 4.0), which permits the non-commercial replication and distribution of the article with the strict proviso that no changes or edits are made and the original work is properly cited (including links to both the formal publication through the relevant DOI and the license). See: <https://creativecommons.org/licenses/by-nc-nd/4.0/>.

References

1. Michaudet C, Malaty J. Chronic Cough: Evaluation and Management. *Am Fam Physician* 2017;96:575-80.
2. COPD Study Group of the Chinese Society for Respiratory Diseases. Guidelines for the diagnosis and treatment of cough (2015). *Chinese Journal of Tuberculosis and Respiratory Diseases* 2016;39:323-54.
3. Cough. In: Zhou Z, Jin S, Li M, et al. editors. *Internal medicine of traditional Chinese medicine*. Beijing: China Press of Traditional Chinese Medicine 2007:71-3.
4. Xiao E, Luo Z. 40 Cases Clinical Effectation observation on gastroesophageal reflux treated with the Pinellia Heart-Draining Decoction combined with Cupping Therapy. *Chinese Journal of Ethnomedicine and Ethnopharmacy* 2014;(22):64.
5. Tian Y, Hua Y. Treating gastroesophageal reflux with classical prescriptions. *Jiangsu Journal of Traditional Chinese Medicine* 2007;39:55-7.
6. Yan X, Han D, Zhang B. The Therapeutic effection observation on 'Direct counterflow downward and cough relieving granule' on gastroesophageal reflux cough. *Journal of practical Internal Medicine* 2009;23:42.
7. Li J, Cao L. 30 cases of gastroesophageal reflux cough treated with Six-Ingredient Rehmannia Decoction Plus Bitter Orange and Platycodon. *Shaanxi traditional Chinese Medicine* 2009;30:1576-7.

doi: 10.21037/lcm.2019.06.01

Cite this article as: Yuan Q, Zhang ZX, Lu YR, Liu J, Guo SD. The treatment of gastroesophageal reflux cough with lung-spleen theory. *Longhua Chin Med* 2019;2:8.