

TCM Treatment of Infectious Atypical Pneumonia — A Report of 16 Cases

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Objective: To probe into the mechanism on TCM treatment of infectious atypical pneumonia (severe acute respiratory syndrome, SARS) and evaluate its feasibility and effectiveness. **Method:** Twelve TCM prescriptions of herbal drugs (orally or iv) were used to treat 16 cases of SARS without using glucocorticoids, anti-viral agents, immune-regulators or antibiotics (in case there was no definite bacterial infections). The symptoms, signs, chest roentgenograms and lab examinations were carefully monitored and recorded for evaluation of the effectiveness. **Results:** The average fever abatement time was 4.44 ± 1.46 days and the mean absorption time of gross pulmonary infiltration was 10.87 ± 2.92 days. No exacerbation occurred during the treatment. **Conclusion:** TCM intervention could effectively control and alleviate the symptoms and prevent the disease from exacerbation.

Based on the *Wen Bing* (Febrile diseases) theory in TCM and the experience obtained in treating more than 60 cases of infectious atypical pneumonia (severe acute respiratory syndrome, SARS) in April, 2003, the authors designed a five-stage and twelve-formulae TCM scheme and used it in the clinical treatment of 16 new SARS cases with promising results which is reported as follows.

Clinical Data

The 16 SARS patients enrolled in this study were definitely diagnosed at China Disease Prevention and Control Center and then transferred to this hospital since the 8th of May, 2003 with no severe complications involving the cardiovascular, respiratory and renal systems. Of them, 11 were males and 5 females, aged 26-63 (mean 36 ± 13) years old. On admission, all the patients had symptoms as fever (16 cases, 100%), cough (11, 68.75%), myalgia (10, 62.5%), fatigue (8, 50%), dyspnea (7, 43.75%), distress in the chest (4, 25%), diarrhea (3, 18.75%), poor appetite (3, 18.75%), headache (2, 12.5%), and aversion to cold (2,

12.5%). Their body temperatures were 38.7 ± 0.78 °C, percutaneous blood oxygen saturation $97.0 \pm 1.26\%$, WBC count $(5.55 \pm 1.56) \times 10^9/L$, lymphocyte count $(1.32 \pm 0.36) \times 10^9/L$, lymphocyte percentage $23.8 \pm 6.54\%$, platelet count $(191.93 \pm 57.32) \times 10^9/L$, alanine transaminase 44.88 ± 31.92 IU/L, lactic dehydrogenase 275.88 ± 80.06 IU/L. On admission, the chest X-ray films showed abnormal findings in all patch-form shadows in both lungs in 7, only in one lung in 4 and increased lung markings in 4 cases.

Treatment Protocol

Clinical manifestations, data of lab testing, X-ray findings before and during the treatment as well as therapeutic measures taken were recorded for evaluation of the effects.

The disease course of SARS cases was divided into 5 stages, namely, the latent, the febrile, the panting and coughing, the panting and collapse, and the convalescence stage. The febrile stage was subdivided into the initial, high fever, and heat-toxin phase. Correspondingly, 12 kinds of TCM formulae

were designed (called SARS Formula, and numbered 1-12) and administered orally with concomitant iv dripping of TCM preparations for each stage or phase. (SARS Formula No. 4 is designed for patients who had used glucocorticoid and therefore not included in this study.)

The febrile stage:

1) The initial phase (pathogens attacking the lung-*wei* system) is characterized by fever for 1-3 days with cough, headache, and aching in the whole body; red tongue proper with white or white and greasy fur, slippery and rapid pulse. The therapeutic principle for this stage was dispelling wind, clearing away heat, resolving toxin and transforming dampness with SARS Formula No.1 [main ingredients: Lu Gen (芦根 *Rhizoma Phragmitis*), Jin Yin Hua (金银花 *Flos Lonicerae*), Chan Tui (蝉蜕 *Periostracum Cicadae*)], added with additional iv dripping of Shuang Huang Lian Injectio (双黄连粉针剂 an antipyretic TCM preparation) and/or Injectio of Houத்துynia (鱼腥草注射液 an Antiphlogistic TCM preparation) .

2) High fever phase (pathogenic heat accumulating in the lung) is characterized by high fever for 3-5 days, coughing, feeling of thirst, profuse sweating, red tongue proper with yellow and thick, or yellow and greasy fur, slippery and rapid pulse. The therapeutic principle of clearing away heat, ventilating the lung, resolving toxin and invigorating blood circulation was applied by administration of SARS Formula No. 2. [main ingredients: Ma Huang (炙麻黄 *Herba Ephedrae*, Preparata), Sheng Shi Gao (生石膏 *Gypsum Fibrosum Crudum*) and Xing Ren (杏仁 *Semen Armeniacae Amarum*)] with additional iv dripping of Qing Kai Ling Injectio (清开灵注射液 an antipyretic TCM preparation), Injectio of Houத்துynia (鱼腥草注射液 an Antiphlogistic TCM preparation) and/or Injectio of Red Sage (丹参注射液 a TCM preparation for cardiovascular disease) .

3) Heat-toxin phase (excess of *qi* and *Ying*, and interweaving of toxin and stasis) is characterized by persistent high fever for more than 5 days, red complexion, cough, short breath, deep red or crimson tongue proper with yellow, thick and dry fur or dark fur, slippery, rapid or deep and taut pulse. The

therapeutic principle of clearing up excessive *qi* and cooling the *ying* system, resolving toxin and invigorating blood circulation was applied by administration of SARS Formula No.3 [main ingredients: Sheng Shi Gao (生石膏 *Gypsum Fibrosum Crudum*)、 Sheng Di (生地 *Radix Rehmanniae*) and Shui Niu Jiao (水牛角 *Cornu Bubali*), added with iv dripping of Xing Nao Qing Injectio (醒脑清注射液), Injectio of Houத்துynia (鱼腥草注射液 an Antiphlogistic TCM preparation) and/or Injectio of Red Sage (丹参注射液 a TCM preparation for cardiovascular disease) .

Panting and coughing stage (heat accumulating in the lung and interweaving of phlegm and stasis):

It is characterized by abatement or incomplete abatement of fever, apparent panting, coughing, short breath, red tongue proper with white or yellow and sticky fur, rapid and forceful pulse. The therapeutic principles of purging pathogenic fire from the lung, relieving panting, clearing the *fu*-organ and invigorating blood circulation was applied by administration of SARS Formula No.5 [main ingredients: Huang Qin (黄芩 *Radix Scutellariae*), Sang Bai Pi (桑白皮 *Cortex Mori*), Gua Lou (瓜蒌 *Fructus Trichosanthis*)] with additional iv dripping of Injectio of Red Sage (丹参注射液 a TCM preparation for cardiovascular disease) .

Panting and collapse stage:

1) Consumption of the pectoral *qi*, which is characterized by rapid and frequent breathing, accelerated heart rate, profuse sweating, lack of vitality, red or pink tongue with thin, white fur, thready, rapid and feeble pulse. The therapeutic principle of correcting collapse by replenishing *qi*, invigorating blood circulation and removing stasis was applied by administration of SARS Formula No.6 [main ingredients: Tai Zi Shen (太子参 *Radix Pseudostellariae*), Huang Qi (黄芪 *Radix Astragali*) and Shan Zhu Yu (山茱萸 *Fructus Corni*)] with additional iv dripping of Injectio of Red Sage (丹参注射液 a TCM preparation for cardiovascular disease) and/or Injectio of Ginseng and Ophiopogon (参麦注射液 a TCM preparation of cardiac tonic). 2) Consumption of the primordial *qi*, which is

characterized by shallow and rapid breath, accelerated heart rate, profuse sweating and cold limbs, pink or light purple tongue proper, and short, rapid and feeble pulse. The therapeutic principle of correcting collapse by warming *yang*, invigorating blood circulation and removing stasis was applied by administration of SARS Formula No.7 [main ingredients: Ren Shen (人參 Radix Ginseng), Zhi Fu Zi (制附子 Radix Aconiti Lateralis preparata) and Huang Qi (黃芪 Radix Astragali) with additional iv dripping of Injectio of Red Sage (丹參注射液 a TCM preparation for cardiovascular disease) and/or Injectio of Ginseng and Aconite (參附注射液 a TCM preparation of cardiac tonic).

Convalescence stage: This stage is characterized by deficiency of the heart- and spleen-*qi* and blood. Symptoms and signs were general weakness, palpitation, short breath, poor appetite, pale tongue proper, thready and feeble pulse. The therapeutic principle of strengthening the spleen by replenishing *qi*, nourishing *yin* to invigorate blood circulation was applied by administration of SARS Formula No. 8 [main ingredients: Tai Zi Shen (太子參 Radix Pseudostellariae), Mai Dong (麥冬 Radix Ophiopogonis) and Jiao San Xian (焦三仙 Stir-fried combination of Fructus Cratagi, Massa Medicata Fermentata Usta and Fructus Hordei Germinatus)] with additional iv dripping of Injectio of Red Sage (丹參注射液 a TCM preparation for cardiovascular disease) and/or Injectio of Ginseng and Ophiopogon (參麥注射液 a TCM preparation of cardiac tonic).

In addition, four patterns of breakdown of the normal physiological coordination between the heart and the kidney, damp-heat in the liver-channels, fire-toxin impairing *yin*, and disorders of the lung collaterals were correspondingly treated with the SARS Formula No. 9-12.

Therapeutic Results

Abatement of fever: Fever was abated in 1-7 (mean, 4.44 ± 1.46) days in all the 16 cases, and the body temperature remained stable after abatement of fever with no recurrence found. Improvement of symptoms: 1) Remission of coughing occurred in 3-8 (mean, 5.27 ± 1.49) days of treatment in all the 11 cases with

cough on admission; 2) remission of dyspnea occurred in 3-7 (mean, 5.15 ± 1.87) days of treatment in all the 7 cases; 3) almost complete remission of general malaise occurred in 2-10 (mean, 6.37 ± 2.49) days of treatment in all the cases.

Lab finding: WBC count: $(7.59 \pm 3.55) \times 10^9/L$, lymphocyte count: $(1.82 \pm 0.58) \times 10^9/L$, lymphocyte percentage: $25.68 \pm 7.27\%$, platelets: $(283.3 \pm 124.09) \times 10^9/L$; alanine transaminase 62.60 ± 52.69 IU/L, lactic dehydrogenase 238.27 ± 34.87 IU/L.

Roentgenography: Absorption of infiltration occurred in 6-16 (10.87 ± 2.92) days; complete absorption was found in 9 cases, and improvement, in the remaining 7 cases.

Discussion

That the long-lasting fever abated in all the 16 patients in a relatively short period with no recurrence demonstrated that TCM treatment was superior to other methods of treatment reported. TCM treatment is also effective in accelerating absorption of infiltration in the lungs. However, there was dysfunction of the liver in some patients, a problem that needs to be further explored.

Since SARS is a fulminating infectious disease primarily affecting the lungs, and therefore named in TCM *Fei Du Yi* "肺毒疫", e.g. an epidemic disease of lung. It is assumed that the pneumonic epidemic pathogen invades the body through the mouth, nose or the skin, attacks the lung, and transforms into toxin when it accumulates and lingers in the target organ for a long time. The toxin is transferred from *Wei* to *qi* and then to the *Ying* systems, causing excess of *qi* and *Ying* and interweaving of toxin and stasis. Together, the heat-, blood- and water-toxins impair the collaterals and injure the lung, with involvement of the heart, liver and the kidney. Consequently, the *qi* and collaterals of the lung are severely hampered, the pectoral-*qi* leaks out and *yin* and *yang* incapable of supporting each other, resulting in consumption of the primordial *qi*. Clinically the main manifestations of SARS are fever, cough, phlegm, panting, and collapse. Fever manifests itself as a form of long-lasting high fever, which is obstinate to antipyretics. Cough is often a dry one, becoming severer due to panting, stifling and phlegm. In the

early stage, there is little or no phlegm, which is white or yellow in color in some cases, however, phlegm is large in amount if complicated by bacterial infection. Panting is characterized by short breath and stifling, aggravated by slight movement, fatigue and lack of strength, and ameliorated by O₂ inhalation. The early phase collapse is characterized by consumption of the pectoral *qi*, shallow and rapid breathing, accelerated heart rate, profuse sweating and lack of vitality, whereas in the late stage, there will be consumption of the primordial *qi*, short breath, rapid, short and swift pulse, profuse sweating, mental debility even confusion, hypotension and cold limbs.

The authors divided the disease course into 4 stages, namely, the latent (roughly corresponding to the viral replication), the panting and coughing (roughly corresponding to the immune reaction), the panting and collapse (roughly corresponding to the lung injury and dysfunction of multiple organs) and the convalescence stage. In severe cases the stages overlapped and could not be divided distinctly. The febrile stage was subdivided into 3 phases, namely, the initial phase (pathogen attacking the lung-*wei* system), the high fever phase (pathogenic heat accumulating in the lung) and the heat-toxin phase (excess of *qi* and *Ying*, and interweaving of toxin and stasis). The panting and coughing manifested to be hyperactivity of fire due to *yin*-deficiency and fire, and interweaving of water and heat if the patient was on steroids, or to be excess of lung-heat and interweaving of phlegm and stasis if the patient used no steroids. The panting and collapse stage includes consumption of the pectoral *qi* and consumption of the primordial *qi*. The convalescence stage manifests itself as deficiency of both *qi* and *yin*, and weakness of the spleen and stomach. Therefore, the authors developed 8 formulae to treat the cases with additional iv dripping of TCM preparations in order to prevent the development of the disease course as early as possible in which the principle of resolving toxin and invigorating blood circulation was applied.

In this series of 16 patients treated as above, a short period of fever abatement with no recurrence, involvement of few organs and a short disease course were witnessed, this needs to be further studied. Following are some points of attention in the TCM treatment of SARS.

To abate fever as complete as possible and treat the toxin and inflammation at the same time since fever is the most important symptom of the early stage and there is evidence of endotoxemia that is absent in common cold.

To invigorate blood circulation and remove stasis throughout the disease course in order to prevent injuries of the target organs by the heat- and blood-toxins.

To adopt preventive measures before the next stage starts, for example, to clear the *qi* system when the *Wei* system is already involved, cool the *Ying* system when the *qi* system is affected, and treat cough and panting as early as possible to prevent collapse.

A warning system was found very helpful in clinical treatment in which the dynamic changes of pulmonary, cardiac, hepatic and renal functions were monitored so as to give treatment in time. For elevation of myocardial enzyme(s), palpitation, short breath and lack of strength, iv dripping of Injectio of Ginseng and Ophiopogon (参麦注射液 a TCM preparation of cardiac tonic), Injectio of Astragalus (黄芪注射液 a TCM preparation for replenish *qi*), Alprostadiol Injectio (凯时注射液), vitamin C and FDP and oral Bu Xin Qi Liquid (补心气口服液 a cardiovascular agent) is indicated. For elevation of hepatic enzymes, iv dripping of Ku Huang Injectio (苦黄注射液 a TCM agent for treating jaundice) or Yin Zhi Huang Injectio (茵栀黄注射液 a TCM preparation for clearing away heat and toxic material) and administration of Yi Gan Ling (益肝灵 a silymarin preparation) can be used. If there is an elevation of urinary micro-albumin, iv dripping of Injectio of Astragalus (黄芪注射液 a TCM preparation for replenish *qi*), Injectio of Red Sage (丹参注射液 a TCM preparation for cardiovascular disease) and oral administration of Bai Ling Capsules (百令胶囊 a drug for respiratory diseases) are indicated in order to shorten the disease course as early as possible.

(Translated by Mao Shuzhang 毛树章)