Covid-19: Past, Present, Future

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TCM Resources for COVID-19

Dr. John Chen: How Coronavirus (Covid-19) is treated with TCM in China

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- **German:Behandlung von COVID-19-Infektionen in China**

TCM Resources for COVID-19

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https://www.elotus.org/content/tcm-resources-covid-19

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Covid-19: Past, Present, Future

- **Past**
  - 伤寒 *Shang Han* (Cold damage)
  - 温热 *Wen Bing* (Warm diseases)
- **Present**
  - Pharmacological research of single herbs
  - Clinical research of formulas
- **Future**
  - Long Covid treatment
  - Covid vaccine toxicity treatment

Post Acute Covid-19 Syndrome

Der Pneumologe

Leitthema

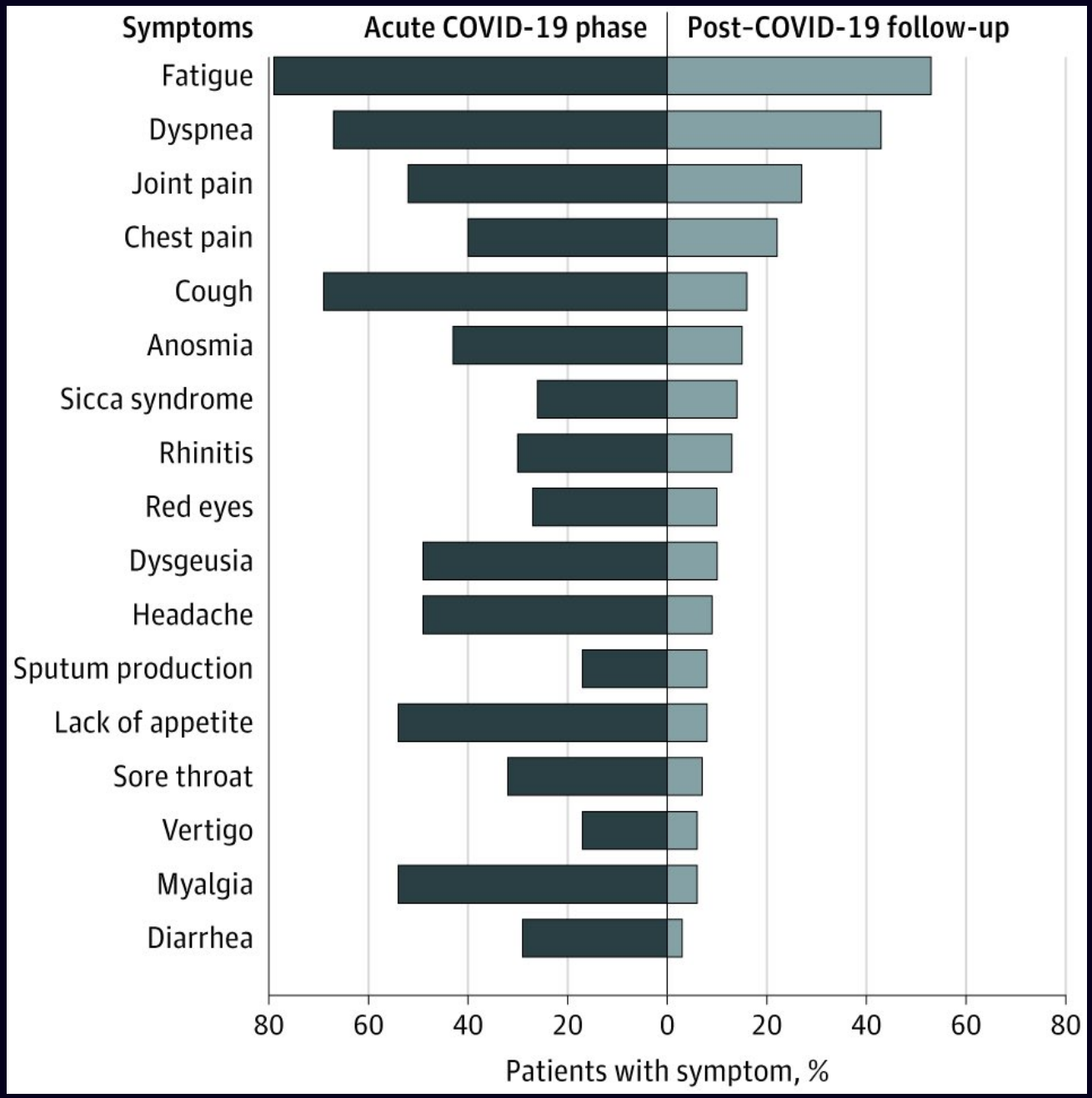
Pneumologe
https://doi.org/10.1007/s10405-020-00347-0

Redaktion
H. Olschewski, Graz/Österreich

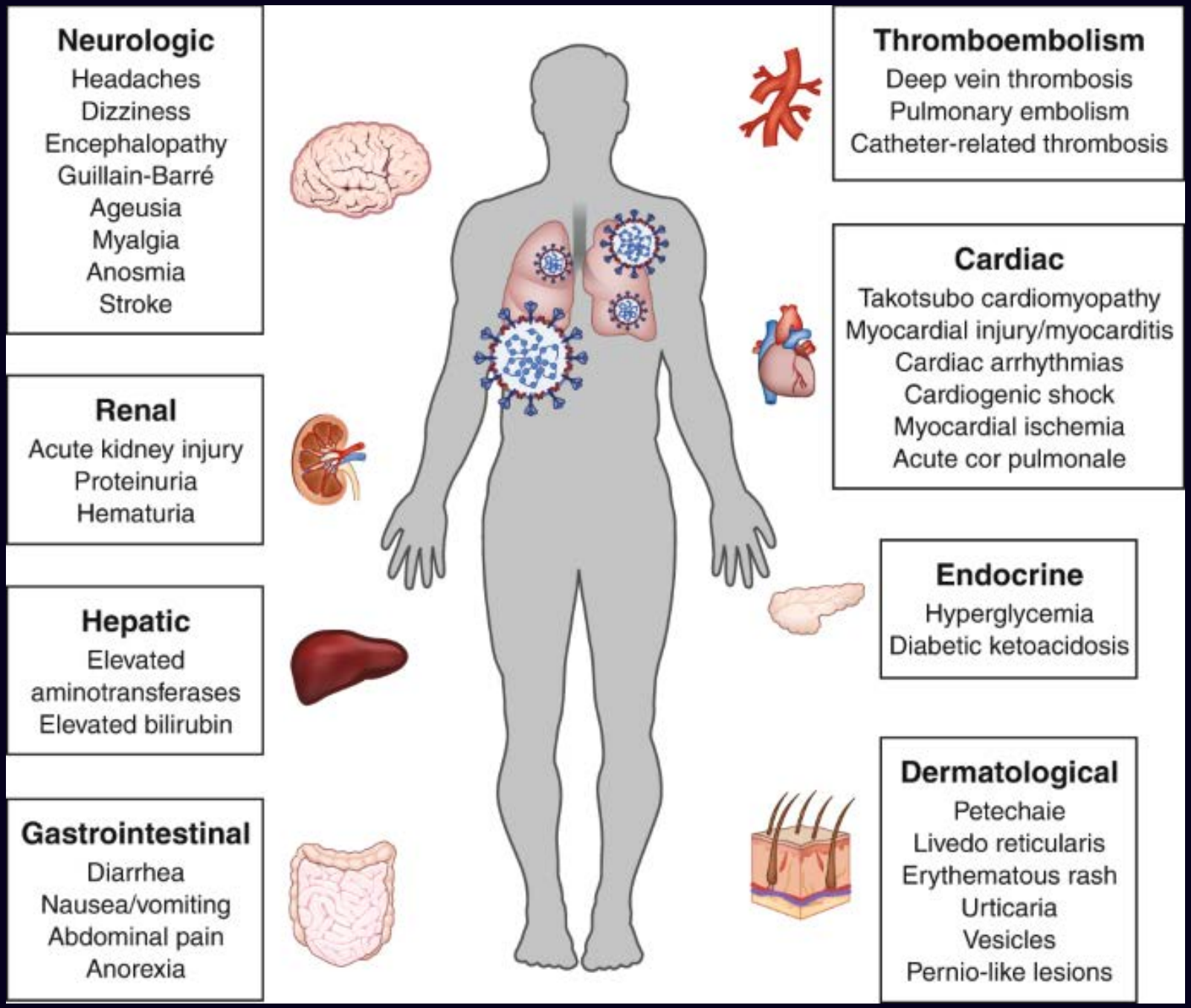
Bernd Lamprecht
Klinik für Lungenheilkunde, Kepler Universitätsklinikum GmbH, Linz, Österreich

Gibt es ein Post-COVID-Syndrom?

Is there a post-COVID syndrome?



Carfì A, Bernabei R, Landi F, for the Gemelli Against COVID-19 Post-Acute Care Study Group. Persistent Symptoms in Patients After Acute COVID-19. *JAMA*. 2020;324(6):603–605. doi:10.1001/jama.2020.12603



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journal homepage: www.elsevier.com/locate/phymed

Review article

Therapeutic options of TCM for organ injuries associated with COVID-19 and the underlying mechanism

Jia-Li Zhang [a], Wen-Xiong Li [a], Yue Li [a], Man-Sau Wong [b,c], Yong-Jun Wang [a,d], Yan Zhang [a,d,*]

- Pathophysiology of Covid-19 and Post Covid Syndrome:
  1. Direct cytotoxic effect
  2. Inflammation and dysregulation of the immune system
  3. Apoptosis and injuries of multiple tissues and/or organs

Zhang JL, Li WX, Li Y, Wong MS, Wang YJ, Zhang Y. Therapeutic options of TCM for organ injuries associated with COVID-19 and the underlying mechanism [published online ahead of print, 2020 Aug 5]. *Phytomedicine*. 2020;153297. doi:10.1016/j.phymed.2020.153297

Pathophysiology of Covid-19 and Post Covid Syndrome

- Direct cytotoxic effect
  - To treat the disease
- Inflammation and dysregulation of the immune system
  - To treat the complication of the disease
- Apoptosis and injuries of multiple tissues and/or organs
  - To treat the sequalae of the disease
    - general approach
    - specific approach
  - Others (acupuncture, moxa, exercise)

Zhang JL, Li WX, Li Y, Wong MS, Wang YJ, Zhang Y. Therapeutic options of TCM for organ injuries associated with COVID-19 and the underlying mechanism [published online ahead of print, 2020 Aug 5]. *Phytomedicine*. 2020;153297. doi:10.1016/j.phymed.2020.153297

Herbs with Antiviral Effect

- These herbs have direct antiviral effect to inhibit the replication of the virus and indirect antiviral effect to block the entrance of the virus into cells.
  - *Jin Yin Hua* (Flos Lonicerae Japonicae)
  - *Lian Qiao* (Fructus Forsythiae)
  - *Ban Lan Gen* (Radix Isatidis)
  - *Da Qing Ye* (Folium Isatidis)
  - *Guang Huo Xiang* (Herba Pogostemon)
  - *Huang Lian* (Rhizoma Coptidis)
  - *Huang Qin* (Radix Scutellariae)
  - *Xiang Chun Ye* (Folium Toonae Sinensis)
  - *Wu Bei Zi* (Galla Chinensis)
  - *Yu Xing Cao* (Herba Houttuyniae)

Herbs with Anti-inflammatory Effect

- These herbs exhibit anti-inflammatory effect by reducing the pro-inflammatory factors, inlcuding IL-1β, IL-7, IL-8, IFN-γ, TNF-α, etc.
  - *Da Huang* (Radix et Rhizoma Rhei)
  - *Huang Qin* (Radix Scutellariae)
  - *Guang Huo Xiang* (Herba Pogostemonis)
  - *Dan Shen* (Radix et Rhizoma Salviae Miltiorrhizae)
  - *Shi Gao* (Gypsum Fibrosum)

Zhang JL, Li WX, Li Y, Wong MS, Wang YJ, Zhang Y. Therapeutic options of TCM for organ injuries associated with COVID-19 and the underlying mechanism [published online ahead of print, 2020 Aug 5]. *Phytomedicine*. 2020;153297. doi:10.1016/j.phymed.2020.153297

Herbs with Antiapoptotic Effect

- These herbs alleviate the apoptosis of the organs and restore the function of the organs, including lungs, heart, liver and kidneys.
  - *Gou Qi Zi* (Fructus Lycii)
  - *Hong Jing Tian* (Radix et Rhizoma Rhodiolae Crenulatae)
  - *Huang Qi* (Radix Astragali)
  - *Hou Po* (Cortex Magnoliae Officinalis)
  - *Huang Qin* (Radix Scutellariae)
  - *Da Huang* (Radix et Rhizoma Rhei)
  - *San Qi* (Radix et Rhizoma Notoginseng)
  - *Chuan Xiong* (Rhizoma Chuanxiong)

Zhang JL, Li WX, Li Y, Wong MS, Wang YJ, Zhang Y. Therapeutic options of TCM for organ injuries associated with COVID-19 and the underlying mechanism [published online ahead of print, 2020 Aug 5]. *Phytomedicine*. 2020;153297. doi:10.1016/j.phymed.2020.153297

How Coronavirus (Covid-19) is Treated with TCM in China

Hubei Provincial Hospital	Wuhan Union Hospital	Guidance for Covid-19
▪Prevention Phase	▪Prevention	
▪Early Phase	▪Wind-Heat Invading the Exterior Syndrome	▪Medical Observation Period
▪Pneumonia Phase	▪Damp Warmth in Early Phase ▪Damp Heat Obstructing the Lung Syndrome ▪Epidemic Toxins Blocking the Lung ▪Closed Interior and Abandoned Exterior	▪Clinical Treatment Period
▪Recovery Phase	▪Insufficiency of qi and yin, Deficiency of Lung and Spleen.	▪Recovery Period

湖北省中醫院
HUBEI PROVINCIAL HOSPITAL OF TCM

- **Recovery Phase**:
- **S/Sx:** Absence of fever, dry cough, chest stuffiness, shortness of breath, shortness of breath upon exertion, dry mouth, weakness.
- **Treatment:** Tonify Qi, Nourish Yin, Tonify Lung and Open the Collaterals
  - 沙参麦门冬汤 *Sha Shen Mai Dong Tang* (Glehnia and Ophiopogonis Decoction)

沙參麥冬湯 *Sha Shen Mai Dong Tang* (Glehnia and Ophiopogonis Decoction)

- *Sha Shen* (Radix Glehniae seu Adenophorae) 15g
- *Mai Dong* (Radix Ophiopogonis) 15g
- *Wu Wei Zi* (Fructus Schisandrae Chinensis) 15g
- *Ren Shen* (Radix et Rhizoma Ginseng) 12g
- *Lai Fu Zi* (Semen Raphani) 15g
- *Si Gua Luo* (Retinervus Luffae Fructus) 15g
- *Ju Luo* (Vascular Citri Reticulatae) 15g
- *Zi Su Zi* (Fructus Perillae) 12g
- *Zhe Bei Mu* (Bulbus Fritillariae Thunbergii) 12g
- *Ku Xing Ren* (Semen Armeniacae Amarum) 12g
- *Huang Qin* (Radix Scutellariae) 15g
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae) 10g

湖北省中医院新型冠状病毒感染的肺炎中医药防治协定方（第一版）

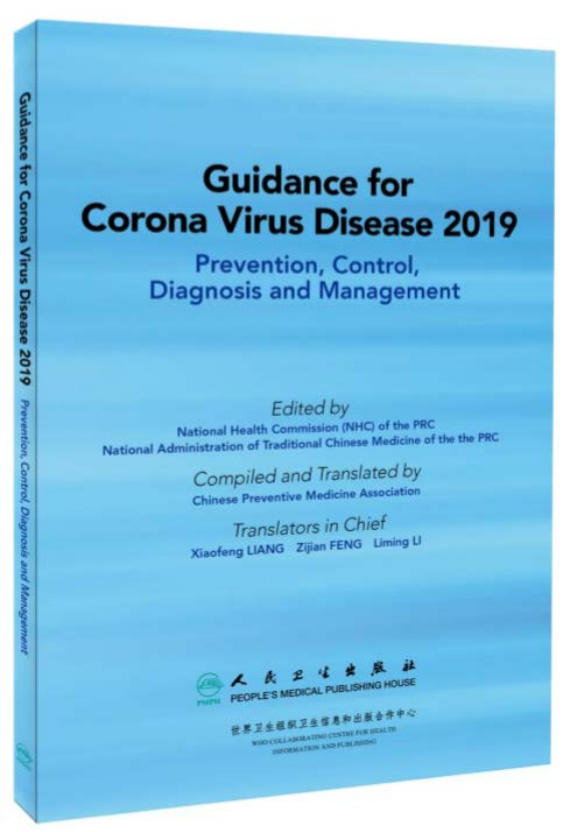
Wuhan Union Hospital of China

- **Recovery Phase**:
- S/Sx: dry cough, feeling of chest oppression, shortness of breath, dyspnea upon movement
- Strengthen Lung and Spleen, tonify qi, nourish yin
- Custom formula

Wuhan Union Hospital of China

- *Sha Shen* (Radix Glehniae seu Adenophorae) 15g
- *Mai Dong* (Radix Ophiopogonis) 15g
- *Yu Zhu* (Rhizoma Polygonati Odorati) 10g
- *Tian Hua Fen* (Radix Trichosanthis) 15g
- *Xi Yang Shen* (Radix Panacis Quinquefolii) 10g
- *Wu Wei Zi* (Fructus Schisandrae Chinensis) 10g
- *Si Gua Luo* (Retinervus Luffae Fructus) 15g
- *Bai Bian Dou* (Semen Lablab Album) 10g
- *Sang Ye* (Folium Mori) 10g
- *Ju Luo* (Vascular Citri Reticulatae) 5g
- *Zi Su Zi* (Fructus Perillae) 10g
- *Zhe Bei Mu* (Bulbus Fritillariae Thunbergii) 10g
- *Ku Xing Ren* (Semen Armeniacae Amarum) 10g
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae) 6g
- *Di Long* (Pheretima) 10g

Covid-19 Recovery

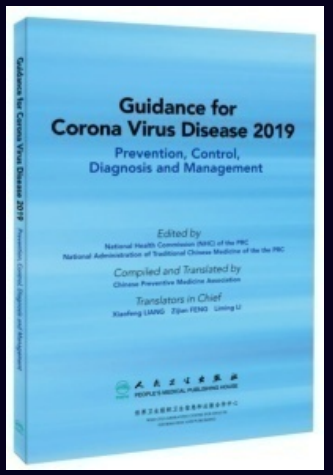


- TCM
  - Deficiency of Lung and Spleen
  - Insufficiency of qi and yin

英文版全文　新型冠状病毒肺炎防控和诊疗指南
https://mp.weixin.qq.com/s/nOAmosQ4YqkXHKdJbBE9GA

Deficiency of Lung and Spleen

- Shortness of breath, tiredness, weakness, poor appetite, nausea, distention and fullness without pain, difficult defecation, incomplete loose stools, pale enlarged tongue, white greasy tongue coating.



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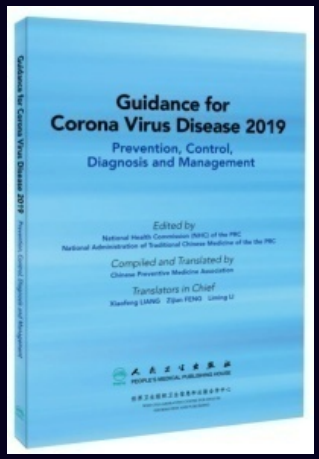
https://mp.weixin.qq.com/s/nOAmosQ4YqkXHKdJbBE9GA

Deficiency of Lung and Spleen

- [Fa] *Ban Xia* (Rhizoma Pinelliae) 9g
- *Chen Pi* (Pericarpium Citri Reticulatae) 10g
- *Dang Shen* (Radix Codonopsis) 15g
- [Zhi] *Huang Qi* (Radix Astragali), honey-fried 30g
- [Chao] *Bai Zhu* (Rhizoma Atractylodis Macrocephalae), dry-fried 10g
- *Fu Ling* (Poria) 15g
- *Guang Huo Xiang* (Herba Pogostemonis) 10g
- *Sha Ren* (Fructus Amomi) 6g
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae) 6g



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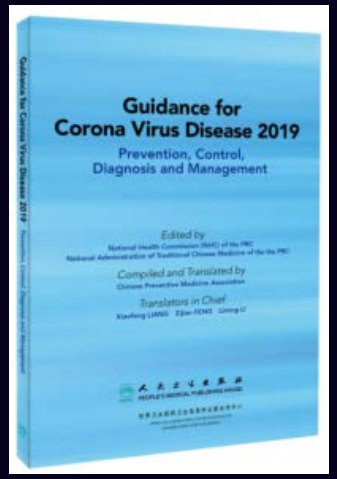
https://mp.weixin.qq.com/s/nOAmosQ4YqkXHKdJbBE9GA

Insufficiency of Qi and Yin

- Fatigue, shortness of breath, dry mouth, thirst, palpitations, poor appetite, low fever or no fever, dry cough, less sputum, dry tongue with lack of moisture, thin or weak pulse without force.



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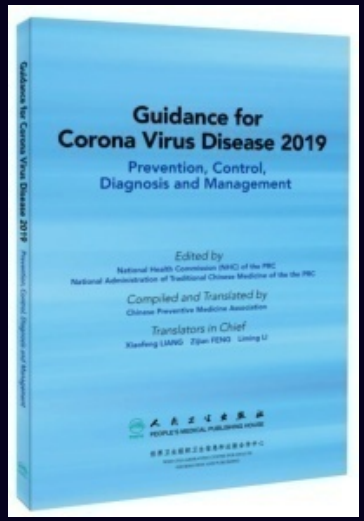
Insufficiency of Qi and Yin

- *Nan Sha Shen* (Radix Adenophorae) 10g
- *Bei Sha Shen* (Radix Glehniae) 10g
- *Mai Dong* (Radix Ophiopogonis) 15g
- *Xi Yang Shen* (Radix Panacis Quinquefolii) 6g
- *Wu Wei Zi* (Fructus Schisandrae Chinensis) 6g
- *Shi Gao* (Gypsum Fibrosum) 15g
- *Dan Zhu Ye* (Herba Lophatheri) 10g
- *Sang Ye* (Folium Mori) 10g
- *Lu Gen* (Rhizoma Phragmitis) 15g
- *Dan Shen* (Radix et Rhizoma Salviae Miltiorrhizae) 15g
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae) 6g



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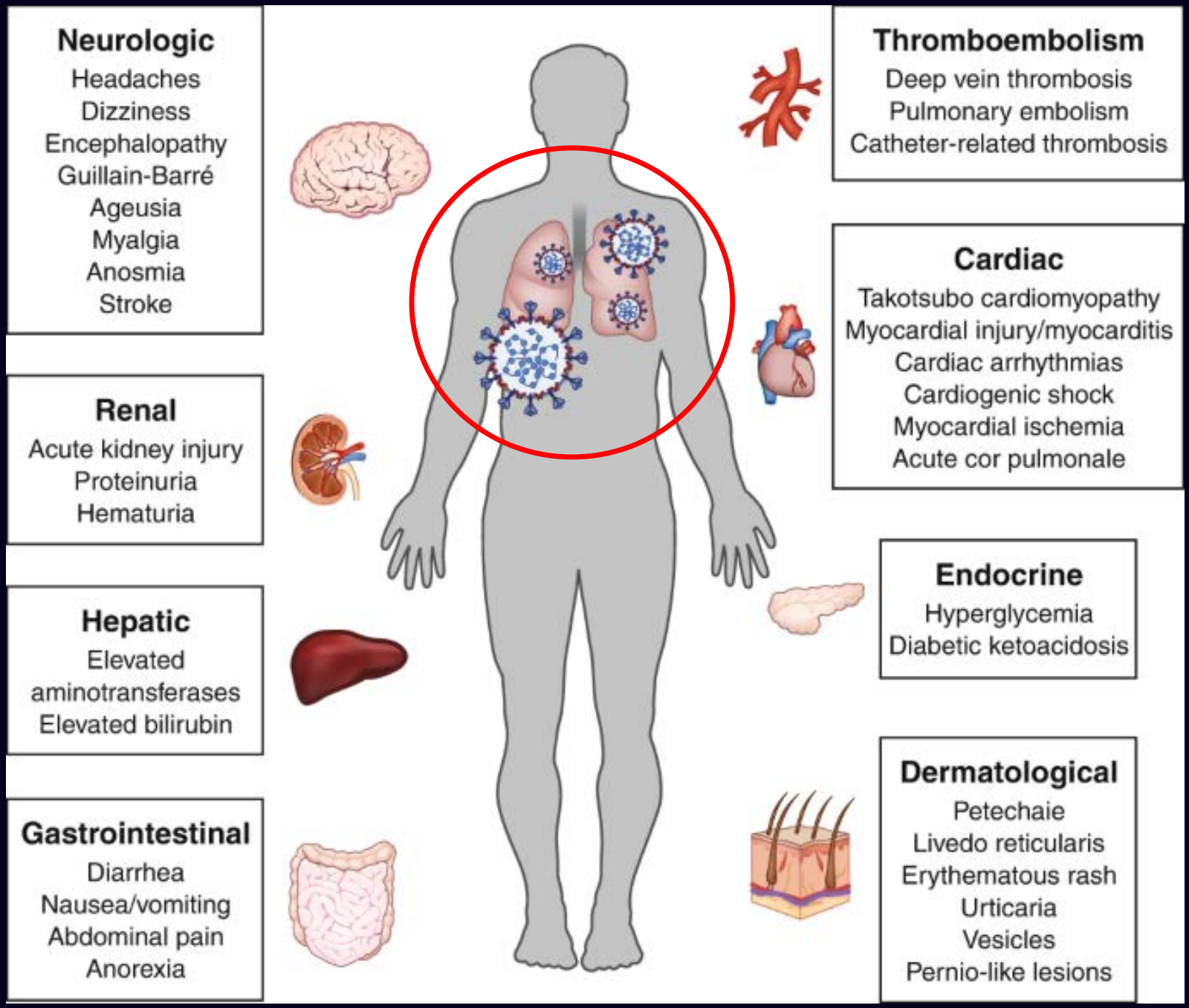

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Study Protocol Systematic Review

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Traditional Chinese medicine for the treatment of pulmonary fibrosis

A protocol for systematic review and meta-analysis of overview

Li-Juan Li, MS[a], Xuan Chen, MS[a], Wen-Na Yang, MS[a], Xiang-Mei Xu, MS[a], Li-Ying Lu, MS[a], Jie Wang, MS[a], Yi-Xuan Kong, MS[a], Jing-Hui Zheng, PhD[b,*]

- We will search 3 foreign electronic databases (Cochrane Library, Embase, PubMed) and 4 Chinese electronic databases (China National Knowledge Infrastructure [CNKI], WangFang Database, Chinese Biomedical Literature Database [CBM], and Chinese Scientific Journal Database [VIP]) to collect potential systematic reviews from their inceptions to February 2020.
- We will consider systematic reviews and meta-analysis of Traditional Chinese Medicine for the Treatment of pulmonary fibrosis.

Li LJ, Chen X, Yang WN, Xu XM, Lu LY, Wang J, Kong YX, Zheng JH. Traditional Chinese medicine for the treatment of pulmonary fibrosis: A protocol for systematic review and meta-analysis of overview. Medicine (Baltimore). 2020 Jul 31;99(31):e21310. doi: 10.1097/MD.0000000000021310. PMID: 32756114; PMCID: PMC7402754.

Hindawi
Evidence-Based Complementary and Alternative Medicine
Volume 2020, Article ID 1752387, 11 pages
https://doi.org/10.1155/2020/1752387

Hindawi

Research Article

Efficacy and Safety of Traditional Chinese Medicine in Idiopathic Pulmonary Fibrosis: A Meta-Analysis

Kun Ji, Jianling Ma, Liangmin Wang, Niuniu Li, Shangjuan Dong, and Liqing Shi

Department of Respiratory Medicine, Dongfang Hospital, Beijing University of Traditional Chinese Medicine, Beijing 100078, China

- To evaluate the efficacy and safety of traditional Chinese medicine (TCM) on lung function and quality of life of idiopathic pulmonary fibrosis (IPF) patients by meta-analysis.

Kun Ji, Jianling Ma, Liangmin Wang, Niuniu Li, Shangjuan Dong, and Liqing Shi. Efficacy and Safety of Traditional Chinese Medicine in Idiopathic Pulmonary Fibrosis: A Meta-Analysis. Hindawi. Evidence-Based Complementary and Alternative Medicine. Volume 2020, Article ID 1752387, 11 pages.

Table 1: Characteristics of all studies included in the meta-analysis.

Study	Regimen Treatment	Control	No. of patients*	Age (years)*	Duration#	Outcomes	Jadad
Cao et al. [12]	Tongluo Huaxian granules + PDN	PDN	30/30	60.27/61.54	6 M	VC%, TLC%	2
Dong [13]	Kangxian Shufei granules + PDN	PDN	33/33	59.11/57.7	3 M	DLCO%, PO_2, FEV1%, FVC %	1
Fan et al. [14]	Kechuanting granules	PDN	32/31	54.11/53.03	6 M	FEV1%, FEV1/FVC,	1
Tan and Li [15]	Shuizhi Tongluo capsule + PDN	PDN	31/31	61.1/63.67	3 M	DLCO%, PO_2	1
Wang et al. [16]	Yangyin Yiqi Misture	PDN	34/30	66.07/63.13	6 M	DLCO%, FEV1%, FVC%,	2
Weng and Ma [17]	Qingjin decoction + PDN	PDN	42/42	52.66/53.33	6 M	PO_2, FEV1%,	2
Chen et al. [18]	Huaxian Pogu formula + PDN	PDN	25/25	63/65	3 M	VC%, DLCO%, TLC%, PO_2	1
Fan et al. [19]	Feixiantong decoction	NAC	22/21	60.98/65.12	12 W	VC%, DLCO%, TLC%	2
Feng et al. [20]	Feixiankang granules + PDN	PDN	30/30	—	6 M	DLCO%, PO_2	1
Gan et al. [21]	Huaxian decoction + PDN	PDN	26/27	63.2/64.5	3 M	DLCO	2
Fan et al. [22]	Feitong oral liquid (high dose)	PDN	73/65	59.01/58.27	3 M	DLCO%, TLC%, PO_2, 6MWD	5
Fan et al. [22]	Feitong oral liquid (low dose)	PDN	66/65	57.38/58.27	3 M	DLCO%, TLC%, PO_2, 6MWD	5
Xu et al. [23]	Bufei Yishen Huoxue decoction + PDN	PDN	35/35	52.32/51.51	12 W	DLCO%, PO_2, FVC%,	3
Chen [24]	Danhong injection + PDN	PDN	45/45	50.2/49.5	12 W	DLCO	2
Li et al. [25]	Feibitongfang	PDN	23/22	59.97/64.59	12 W	VC%, TLC%, PO_2	2
Yan et al. [26]	Buyang Huanwu decoction + NAC	NAC	60/60	63.5/63.4	6 M	DLCO%, PO_2, FEV1%	2
Li et al. [27]	Yangyin Yifei Tongluo Wan	NAC	34/30	58.23/59.98	3 M	VC%, DLCO%, TLC%	2
Liu et al. [28]	Xuefu Zhuyu capsule + NAC	NAC	18/16	—	18 M	DLCO%, TLC%, PO_2, FVC %, 6MWD	2
Song [29]	Xuefu Zhuyu decoction + PDN	PDN	48/48	62.1/63.27	3 M	FEV1%, FVC%, SGRQ	2
Sun et al. [30]	Danhong injection + ED	ED	35/35	48.2/50.8	12 W	DLCO, PO_2	2
Yan [31]	Danhong injection + PDN	PDN	34/34	52.3/53.5	12 W	DLCO	1
Hu et al. [32]	Yiqi Huoyu Tongluo decoction + PDN	PDN	40/40	53.87/54.19	12 W	DLCO, PO_2, SGRQ	2
Wang et al. [33]	Wenyang Huoyu decoction + NAC	NAC	43/37	—	3 M	VC%, DLCO%, TLC%,	1
Zhao and Wu [34]	Danhong Injection + NAC	NAC	40/40	62.3/62.8	12 W	DLCO, PO_2, FEV1/FVC	1
Han et al. [35]	Pingfeng Shengmai powder + PDN	PDN	47/47	59.23/58.64	3 M	VC%, DLCO%, TLC%, PO_2	1
Hu [36]	Pingfeng Shengmai powder + PDN	PDN	45/44	56.21/56.68	6 M	FEV1%, FVC%, 6MWD	1
Li et al. [37]	Peiyuan Huoxue decoction + PDN	PDN	42/42	59.4/59.8	6 M	FEV1/FVC	1
Miao et al. [38]	Bushen Tongluo decoction	NAC	28/27	62.36/65.68	12 W	VC%, DLCO%, 6MWD, SGRQ	2
Wang [39]	Xuefu Zhuyu decoction + PDN	PDN	162/162	60.6/61.3	24 W	FVC%	2
Xie and Tong [40]	Yangyin Yiqi Misture + DXM	DXM	45/45	—	3 M	FEV1/FVC, 6MWD, SGRQ	2
Xin and Feng [41]	Erjiaxiaozheng decoction	NAC	25/24	65.68/65.88	6 M	6MWD, SGRQ	1
Yuan et al. [42]	Bufei Yishen Huoxue Misture + DXM	DXM	39/39	68.56/69.61	3 M	FEV1%, FEV1/FVC, 6MWD, SGRQ	2
Cui et.al. [43]	Fuzheng Tixie Souluo decoction	Placebo	30/31	63.9/62.61	12 W	VC%, DLCO%, TLC%, FEV1%, FVC%, SGRQ	4
Deng and Wang [44]	Huangqi Taohong decoction + PDN	PDN	59/59	64.06/63.21	3 M	DLCO%, PO_2, FVC%	2
Feng and Sun [45]	Yifei Tongluo recipe + NAC	NAC	31/31	61/62.3	6 M	DLCO, 6MWD	2
Fu and Lu [46]	Loubei Lengshu decoction	PDN	50/50	—	3 M	DLCO%, TLC%	2

血府逐瘀湯 *Xuè Fǔ Zhú Yū Tāng* (Drive Out Stasis in the Mansion of Blood Decoction)

- *Tao Ren* (Semen Persicae) 12g
- *Hong Hua* (Flos Carthami) 9g
- *Di Huang* (Radix Rehmanniae) 9g
- *Dang Gui* (Radix Angelicae Sinensis) 9g
- *Chi Shao* (Radix Paeoniae Rubra) 6g
- *Chuan Xiong* (Rhizoma Chuanxiong) 4.5g
- *Chai Hu* (Radix Bupleuri) 3g
- *Zhi Qiao* (Fructus Citri Aurantii) 6g
- *Jie Geng* (Radix Platycodonis) 4.5g
- *Chuan Niu Xi* (Radix Cyathulae) 9g
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae) 6g

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

血府逐瘀湯 *Xuè Fǔ Zhú Yū Tāng* (Drive Out Stasis in the Mansion of Blood Decoction)

- Blood stagnation in the chest and obstructed blood circulation: chronic stabbing pain at a fixed location in the chest and/or the head, hypochondriac pain, chronic and constant hiccups, dry heaves or vomiting after intake of water, palpitations, insomnia, restless sleep, fidgeting, bad temper, tidal fever in the evenings, dark red tongue body with petechiae spots on the top or the sides, dark lips, dark eyes, and a rough or wiry, tight pulse.
- Coronary heart disease, angina pectoris, hypertension, rheumatic heart disease, thrombosis, embolism, cardiac ischemia, bradyarrhythmia, stroke, concussion, post-concussion syndrome, cerebral atherosclerosis, hyperlipidemia, pneumothorax, physical injury to the chest, hepatitis, pancreatitis, headache, vascular headache, insomnia, phlebitis, mammary gland hyperplasia, pelvic inflammatory disease, schizophrenia, functional neurosis, endometriosis, and amenorrhea.

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

血府逐瘀湯 *Xuè Fǔ Zhú Yū Tāng* (Drive Out Stasis in the Mansion of Blood Decoction)

- Activates blood circulation and dispels blood stagnation
- Activates qi circulation and relieves pain
- Antiplatelet
- Anticoagulant
- Cardiovascular

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

Feasility of Yiqi Xuanbi Decoction treating pulmonary fibrosis after new crown pneumonia.

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益气宣痹汤治疗新冠肺炎后肺纤维化倾向可行性探讨

魏耕树* 朱恩林 王欣 王卓
（陕西中医药大学附属医院，陕西咸阳 712000）

摘 要：随着新型冠状病毒肺炎符合出院标准的患者逐渐增多，出院后新冠肺炎后肺间质纤维化倾向的治疗应该引起重视，查阅文献，并分析新冠肺炎后肺纤维化倾向的临床特征及中医分型，发现恢复期患者病机为虚实夹杂，肺气不宣，其虚以肺脾气虚或气阴两虚为主，其实以痰瘀阻络为主。益气宣痹汤具有益气宣痹、活血通络作用，为临床治疗肺间质纤维化的经验方，建议对新冠肺炎后肺纤维化倾向患者给予治疗。

关键词：新冠肺炎；肺间质纤维化；虚实夹杂；益气宣痹汤

Gengshu Wei, Enlin Zhu, Xin Wang, Zhuo Wang. Feasility of Yiqi Xuanbi Decoction treating pulmonary fibrosis after new crown pneumonia. Journal of Shanxi University of Chinese Medicine. 2020-03-19. 16:43:20

Feasibility of Yiqi Xuanbi Decoctionin treating pulmonary fibro – sisafter new crown pneumonia

Gengshu Wei , Enlin Zhu, Xin Wang, Zhuo Wang

(Affiliated Hospital of Shaanxi University of Chinese Medicine, Xianyang China, 712000)

Abstract: With novel coronavirus pneumonia meeting the discharge standard, patients gradually increase. After novel coronavirus pneumonia, the treatment of pulmonary fibrosis tends to be emphasized. Literature review, and novel coronavirus pneumonia after the analysis of the clinical characteristics and TCM classification of lung fibrosis. It was found that the patients in the recovery period were deficiency of lung qi and spleen or deficiency of both qi and Yin, Phlegm and blood stasis block collaterals, The pathogenesis of the disease is mixed with deficiency and excess, and the lung qi is not clear.

Keywords: Novel coronavirus pneumonia; Pulmonary fibrosis; Deficiency and excess; Yiqi Xuanbi Decoction

- Phlegm and blood stasis blocking collaterals
- Deficiency of Lung and Spleen, deficiency of qi and yin

Gengshu Wei, Enlin Zhu, Xin Wang, Zhuo Wang. Feasility of Yiqi Xuanbi Decoction treating pulmonary fibrosis after new crown pneumonia. Journal of Shanxi University of Chinese Medicine. 2020-03-19. 16:43:20

益气宣痹汤 *Yìqì Xuānbì Tāng* (Benefit Qi and Disperse Bi Decoction)

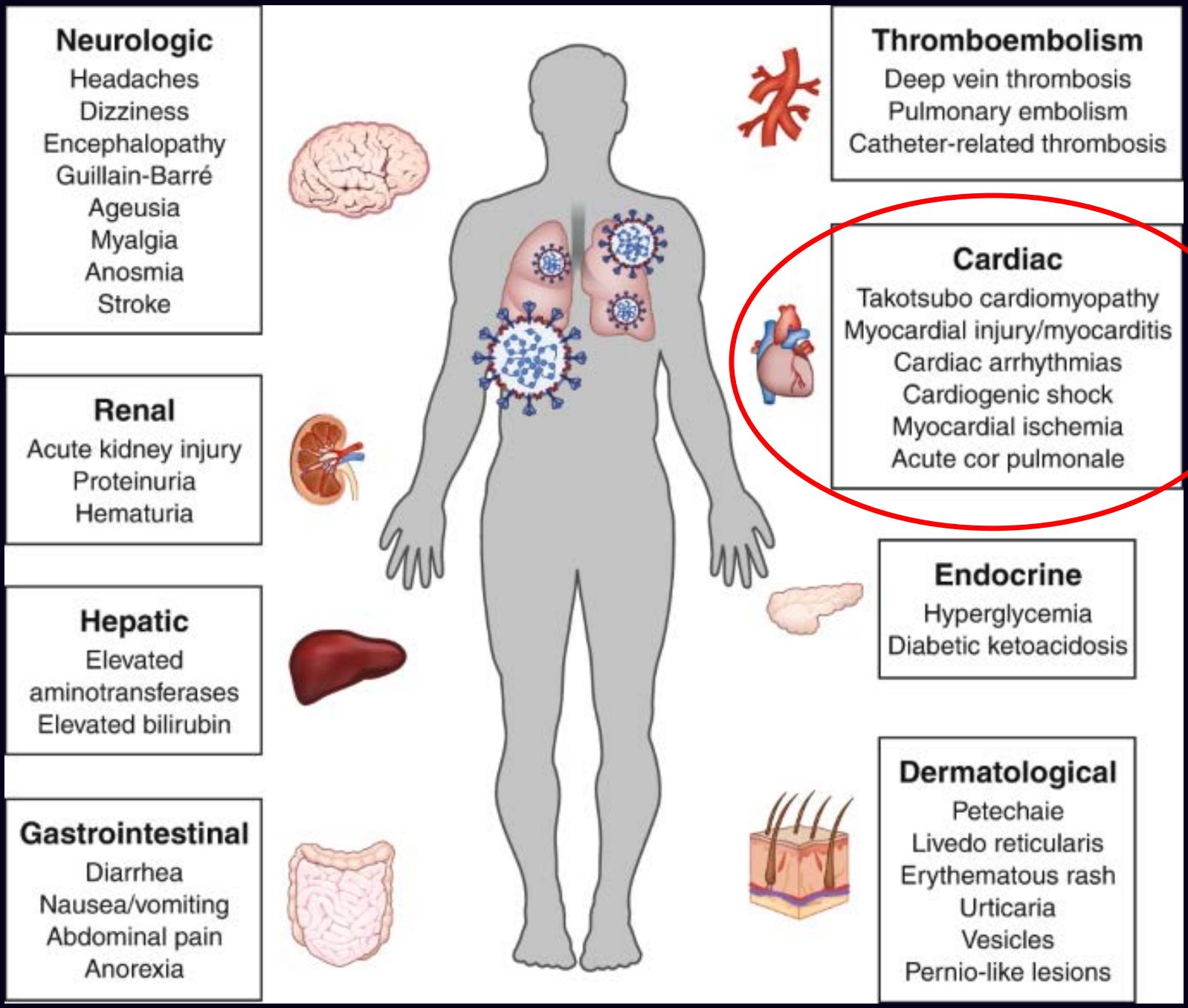
- *Huang Qi* (Radix Astragali) 30-60g
- *Huang Jing* (Rhizoma Polygonati)
- *Bai Zhu* (Rhizoma Atractylodis Macrocephalae)
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae)
- *Di Long* (Pheretima)
- *Ji Xue Teng* (Caulis Spatholobi)
- *Zhe Bei Mu* (Bulbus Fritillariae Thunbergii)
- *Jiang Ban Xia* (Rhizoma Pinelliae Praeparatum cum Zingibere et Alumine)
- *Ku Xing Ren* (Semen Armeniacae Amarum)
- *Jie Geng* (Radix Platycodonis)
- *Lai Fu Zi* (Semen Raphani)
- *Hou Po* (Cortex Magnoliae Officinalis)
- *Chi Shao* (Radix Paeoniae Rubra)

Gengshu Wei, Enlin Zhu, Xin Wang, Zhuo Wang. Feasility of Yiqi Xuanbi Decoction treating pulmonary fibrosis after new crown pneumonia. Journal of Shanxi University of Chinese Medicine. 2020-03-19. 16:43:20

益气宣痹汤 *Yìqì Xuānbì Tāng* (Benefit Qi and Disperse Bi Decoction)

- With Lung and Spleen qi deficiency and residual dampness and toxins, add: *Guang Huo Xiang* (Herba Pogostemonis), *Yi Yi Ren* (Semen Coicis), *Pei Lan* (Herba Eupatorii) and *Zi Su Geng* (Caulis Perillae).
- With qi and yin deficiency and yin deficiency heat: add *Sha Shen* (Radix Glehniae seu Adenophorae), *Mai Dong* (Radix Ophiopogonis), *Zhi Mu* (Rhizoma Anemarrhenae) and *Qing Hao* (Herba Artemisiae Annuae).

Gengshu Wei, Enlin Zhu, Xin Wang, Zhuo Wang. Feasility of Yiqi Xuanbi Decoction treating pulmonary fibrosis after new crown pneumonia. Journal of Shanxi University of Chinese Medicine. 2020-03-19. 16:43:20



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Traditional Chinese herbal medicine at the forefront battle against COVID-19: Clinical experience and scientific basis

David Y.W. Lee[a,*], Qing Y. Li[a,b], Jing Liu[a], Thomas Efferth[c,*]

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[c] *Department of Pharmaceutical Biology, Institute of Pharmaceutical and Biomedical Sciences, Johannes Gutenberg University, Mainz, Germany 55128*

- Combine ancient wisdom and accumulated clinical experience with cutting edge science and technologies to fight with the devastating COVID-19 pandemic.

Lee DYW, Li QY, Liu J, Efferth T. Traditional Chinese herbal medicine at the forefront battle against COVID-19: Clinical experience and scientific basis. Phytomedicine. 2021 Jan;80:153337. doi: 10.1016/j.phymed.2020.153337. Epub 2020 Sep 28. PMID: 33221457; PMCID: PMC7521884.

Formulas, Sx, Clinical Manifestations

The TCM symptoms of COVID-19

TCM	Symptoms	Clinical manifestations
Ma xing shi gan decoction	Wind-heat attacks the lungs, wind-cold transformed into heat, *wen bing - qi* stage lung heat	Cough with thick sticky, yellow sputum,sore, red, swollen throat, thirst, with desire to drink cold liquids, runny or blocked nose with thick yellow discharge, vertigo, dry throat, dizziness, fever with or without perspiration, slight chills, aversion to wind, headache, dyspnea with flared nostrils and pain
Gancao ganjiang decoction	Deficiency cold lung atrophy, abdominal pain due to spleen and stomach deficiency, bleeding due to spleen *yang* deficiency, externally generated fevers with internal cold	Cold extremities,no thirst,dry throat,excessive salivation with spitting up of clear fluids,no coughing,spontaneous sweating,a bland taste in the mouth,cold breath, frequent, clear urination, irritability
Qingfei paidu decoction	Lung heat	High fever, no chills, aversion to heat, cough, asthma, restlessness, thirst, dark yellow urine
Shegan mahuang decoction	Wind-cold with cold thin mucus*tan yin*, cough and asthma due to cold,retention of cold-phlegm in the lungs	Pronounced coughing,pronounced wheezing, aversion to cold, headache, rales, dyspnea, profuse, clear, watery sputum orscanty, clear sputum, a feeling of fullness and a stifling sensation in the chest and diaphragm,rattling sounds in the throat
Lianhua qingwen capsule	Detoxification, ventilating lungs and heat.	Fever or high fever,aversion to cold,muscle aches, nasal congestion and runny nose, cough, headache, dry throat, sore throat, red tongue, yellow or greasy coating
Jinhua qinggan granules	Disperse wind and lungs, clear heat and detoxification	Fever, head and body pain, sore throat, dry cough, stuffy nose, red tongue,zhin yellow tongue coating
Shengmai san	Lung and kidney *qi* deficiency, heart and lung *qi* deficiency, lung *qi* and *yin* deficiency, atrophy disorder (*wei* syndrome) due to lung heat with fluid deficiency	Chronic cough with sparse sputum, sputum difficult to expectorate, shortness of breath,spontaneous perspiration, dry mouth and tongue, dry skin, palpitations with a stifling sensation in chest, fatigue,i rritability

Lee DYW, Li QY, Liu J, Efferth T. Traditional Chinese herbal medicine at the forefront battle against COVID-19: Clinical experience and scientific basis. Phytomedicine. 2021 Jan;80:153337. doi: 10.1016/j.phymed.2020.153337. Epub 2020 Sep 28. PMID: 33221457; PMCID: PMC7521884.

生脉散 *Shēng Mài Sǎn* (Generate the Pulse Powder)

- *Ren Shen* (Radix et Rhizoma Ginseng) 1.5g [10g]
- *Mai Dong* (Radix Ophiopogonis) 1.5g [10-15g]
- *Wu Wei Zi* (Fructus Schisandrae Chinensis) 7 seeds [6g]

生脉散 *Shēng Mài Sǎn* (Generate the Pulse Powder)

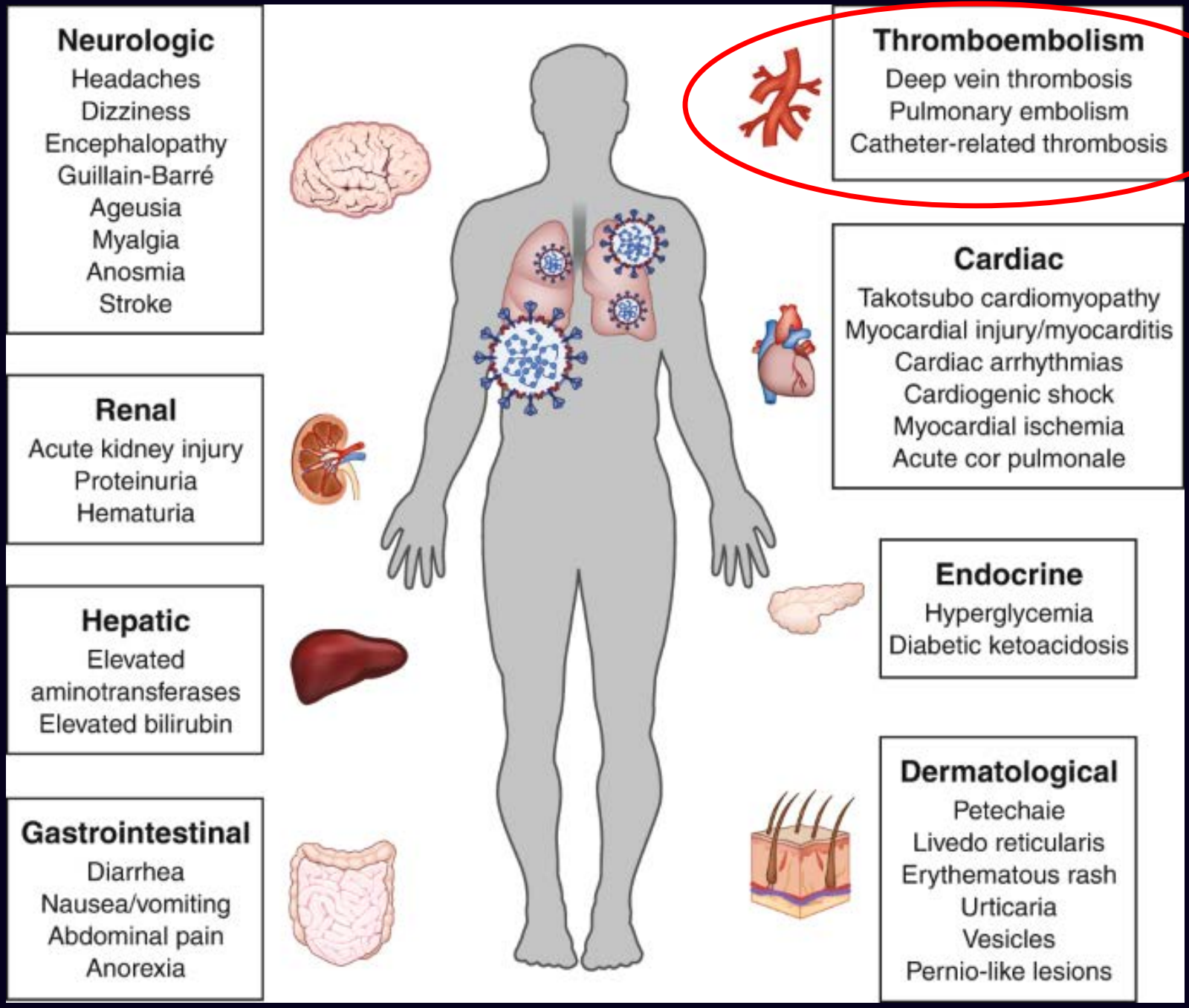
- Damaged qi and yin due to chronic coughing: coughing with scanty sputum, shortness of breath, spontaneous perspiration, a dry mouth and tongue with a dry, thin tongue coating, and a deficient, rapid or deficient, fine pulse.
- Shock, coronary artery disease, angina pectoris, myocardial infarction, cardiac failure, congestive heart failure, arrhythmia, viral myocarditis, myocarditis, hypotension, cerebral infarction, Alzheimer's disease, leukopenia, chronic cough, pulmonary tuberculosis, chronic bronchitis, infertility, and diabetes mellitus.

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

生脉散 *Shēng Mài Sǎn* (Generate the Pulse Powder)

- Tonifies qi and promotes body fluid secretion
- Astringes yin and stops perspiration
- Cardioprotective
- Cardiovascular
- Immunostimulant
- Anti-inflammatory

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009



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Blood Stasis

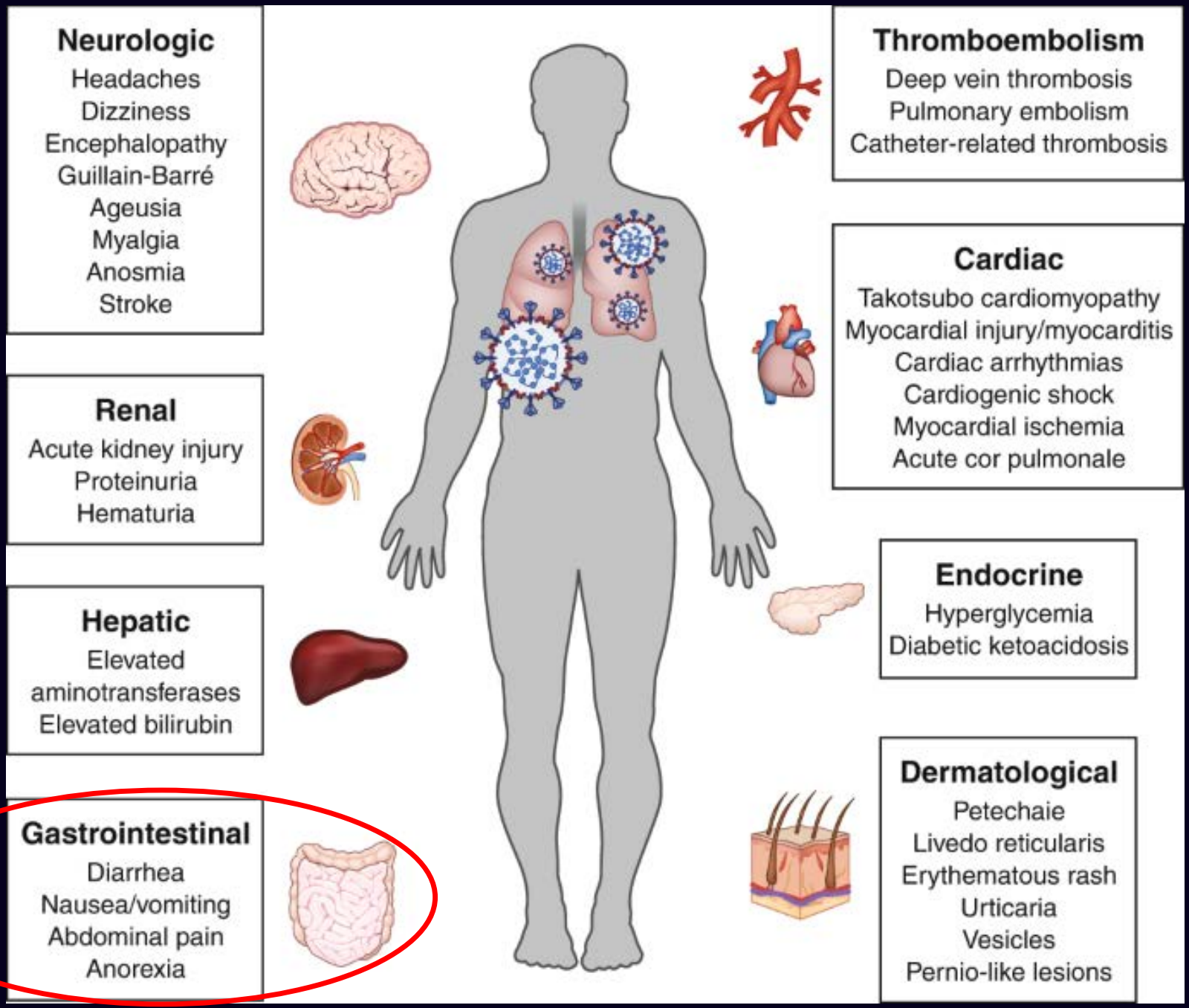
- 通窍活血汤 *Tōng Qiào Huó Xuè Tāng*
  (Unblock the Orifices and Invigorate the Blood Decoction)
- 血府逐瘀汤 *Xuè Fǔ Zhú Yū Tāng*
  (Drive Out Stasis in the Mansion of Blood Decoction)
- 膈下逐瘀汤 *Gé Xià Zhú Yū Tāng*
  (Drive Out Blood Stasis Below the Diaphragm Decoction)
- 少腹逐瘀汤 *Shào Fù Zhú Yū Tāng*
  (Drive Out Blood Stasis in the Lower Abdomen Decoction)
- 身痛逐瘀汤 *Shēn Tòng Zhú Yū Tāng*
  (Drive Out Blood Stasis from a Painful Body Decoction)

水蛭 *Shuǐ Zhì* (Hirudo)

- Breaks and eliminates blood stasis

Hirudin / Refludan (Lepirudin)

- Lepirudin is an anticoagulant that functions as a direct thrombin inhibitor.



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Luo *et al. Chin Med* (2020) 15:94
https://doi.org/10.1186/s13020-020-00375-1

Chinese Medicine

REVIEW

Open Access

Reflections on treatment of COVID-19 with traditional Chinese medicine

Hua Luo†, Yan Gao†, Jian Zou, Siyuan Zhang, Hanbin Chen, Qiao Liu, Dechao Tan, Yan Han, Yonghua Zhao* and Shengpeng Wang*

- The advantages of TCM in the treatment of COVID-19 include effective relief of symptoms, retarding the development from mild and moderate to severe, improvement of cure rate, reducing death rates, and promotion of rehabilitation.

Luo, H., Gao, Y., Zou, J. *et al.* Reflections on treatment of COVID-19 with traditional Chinese medicine. *Chin Med* **15,** 94 (2020). https://doi.org/10.1186/s13020-020-00375-1

Chinese Herbs for Covid at Diff Stages

Table 2 Representative Chinese patent drugs used for treatment of COVID-19 at different stages

Stage of disease	TCM formula
Medical observation	Sanao tablet, Yupingfeng powder, Lingyang Ganmao tablet, Fangfeng Tongsheng pill, Huoxiang Zhengqi capsule, Kangbingdu oral liquid, Shenge Yifei capsule, Fufang Yinchai granule, Lianhua Qingwen capsule, Jinhua Qinggan granule, Qingkailing soft capsule, Shanlameiye granule, Shenling Baizhu capsule, Shufeng Jiedu capsule, Qixiang Yiqi Jiedu granule
Mild case	Jingbai Fangdu powder, Jiuwei Qianghuo pill, Lanqin oral liquid, Tanreqing capsule, Ertong Kanggan granule, Chaishi Tuire Granule, Jinhua Qinggan granule, Kangbingdu oral liquid, Toujie Quwen granule, Shufeng Jiedu capsule, Kegan Liyan oral liquid, Qingre Huashi oral liquid, Xiaoer Qingre Lifei oral liquid
Severe case	Angong Niuhuang pill, Xiaochaihu granule, Fangfeng Tongsheng pill, Huashi Baidu decoction, Xiyanping injection, Xingnaojing injection, Reduning injection, Tanreqing injection, Xuebijing injection
Critical case	Zhibao pill, Zixue pill, Suhexiang pill, Shenmai injection, Shengmai injection, Angong Niuhuang pill, Shenfu injection, Xingnaojing injection, Reduning injection, Tanreqing injection, Xuebijing injection
Convalescence	Shenling Baizhu capsule

Luo, H., Gao, Y., Zou, J. *et al.* Reflections on treatment of COVID-19 with traditional Chinese medicine. *Chin Med* **15,** 94 (2020). https://doi.org/10.1186/s13020-020-00375-1

Chinese Herbs for Covid at Diff Stages

- Stage: Convalescence
- Formula: Shenling Baizhu capsule
  - *Shen Ling Bai Zhu San* (Ginseng, Poria, and Atractylodes Macrocephala Powder) in capsules

Luo, H., Gao, Y., Zou, J. *et al.* Reflections on treatment of COVID-19 with traditional Chinese medicine. *Chin Med* **15,** 94 (2020). https://doi.org/10.1186/s13020-020-00375-1

参苓白术散 *Shēn Líng Bái Zhú Sǎn*
(Ginseng, Poria, and Atractylodes Macrocephala Powder)

- *Ren Shen* (Radix et Rhizoma Ginseng) 960g [15g]
- *Bai Zhu* (Rhizoma Atractylodis Macrocephalae) 960g [15g]
- *Fu Ling* (Poria) 960g [15g]
- *Gan Cao* (Radix et Rhizoma Glycyrrhizae), 960g [9g]
- *Shan Yao* (Rhizoma Dioscoreae) 960g [15g]
- *Lian Zi* (Semen Nelumbinis) 480g [9g]
- *Bai Bian Dou* (Semen Lablab Album), 720g [12g]
- *Yi Yi Ren* (Semen Coicis) 480g [9g]
- *Sha Ren* (Fructus Amomi) 480g [6g]
- *Jie Geng* (Radix Platycodonis), 480g [6g]

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

參苓白术散 *Shēn Líng Bái Zhú Sǎn*
(Ginseng, Poria, and Atractylodes Macrocephala Powder)

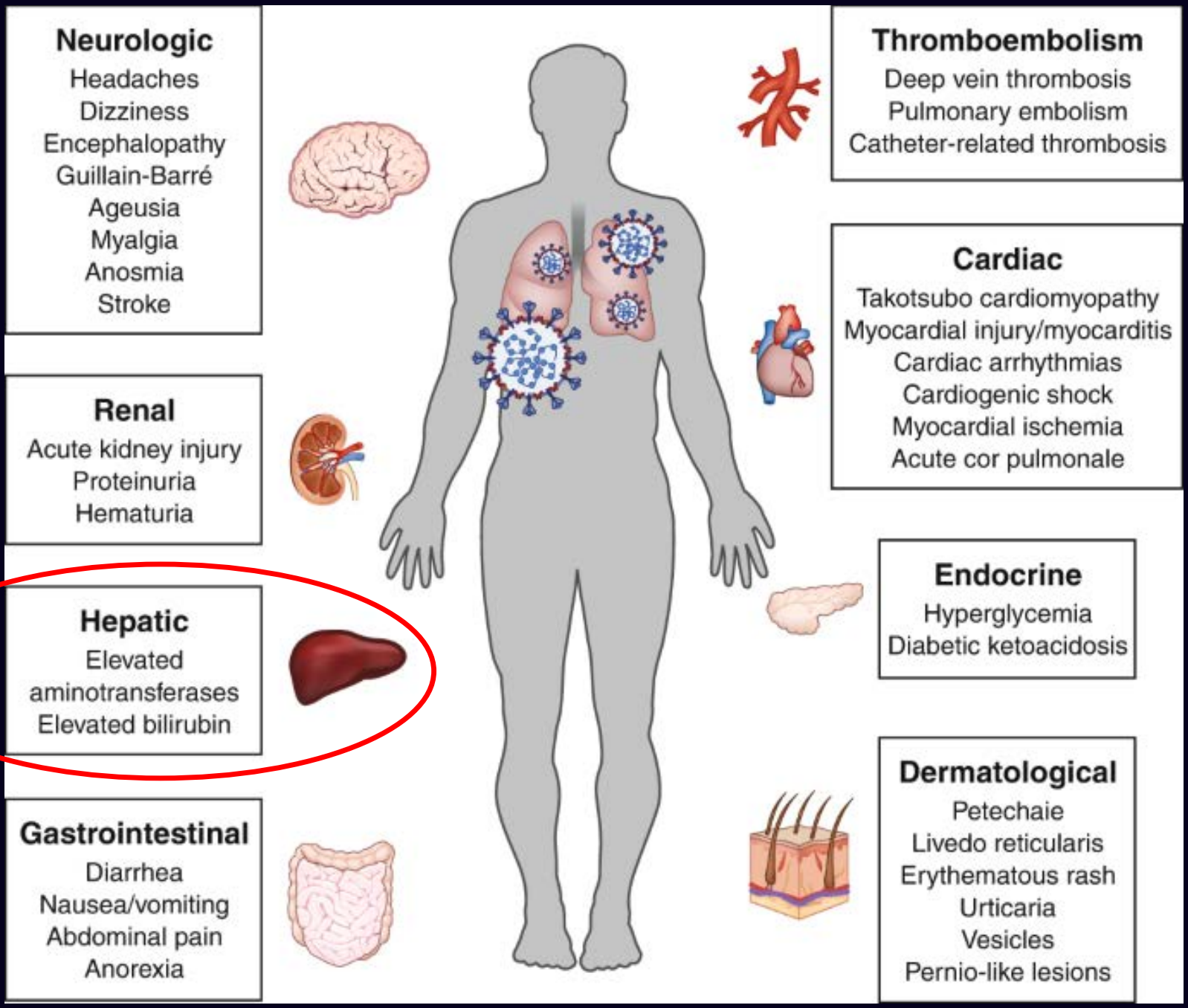
- Spleen and Stomach deficiencies with dampness: loose stools or diarrhea, vomiting, borborygmus, decreased appetite, weak extremities, weight loss, a sallow facial appearance, epigastric or chest fullness and a stifling sensation, a pale red tongue with a white tongue coating, and a fine, moderate or deficient, moderate pulse.
- Superficial gastritis, chronic gastroenteritis, chronic diarrhea, infantile diarrhea, dyspepsia, duodenal ulcer, gastroptosis, chronic colitis, irritable bowel syndrome, proctitis, nephritis, hepatitis and liver cirrhosis, compromised immune system, supportive therapy for chemotherapy and radiation, debility after chronic illness, cognitive impairment, rhinitis, edema, and abnormal vaginal discharge.

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

参苓白术散 *Shēn Líng Bái Zhú Sǎn*
(Ginseng, Poria, and Atractylodes Macrocephala Powder)

- Tonifies qi and strengthens the Spleen
- Resolves dampness and stops diarrhea
- Gastrointestinal
- Gastroprotective

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009



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International Journal of Medical Sciences

2021; 18(3): 646-651. doi: 10.7150/ijms.52664

Research Paper

Clinical characteristics and impacts of traditional Chinese medicine treatment on the convalescents of COVID-19

Ya-Wen An[1], Bo Yuan[2], Jian-Chun Wang[1], Cheng Wang[2], Ting-Ting Liu[3], Shuo Song[1]✉, Han-Qing Liu[1]✉

- "The mechanisms of TCM treatment might be the overall regulations, including balanced immune response, improved hematopoiesis and coagulation systems, enhanced functions of liver and heart, increased nutrient intake and lipid metabolism."

An YW, Yuan B, Wang JC, et al. Clinical characteristics and impacts of traditional Chinese medicine treatment on the convalescents of COVID-19. *Int J Med Sci*. 2021;18(3):646-651. Published 2021 Jan 1. doi:10.7150/ijms.52664

Shenzhen Samii International Medical Center

- Herbal formulas recommended for rehabilitation by Health Commission of Shenzhen Municipality and Beijing University of TCM:
  - *Shen Ling Bai Zhu San*
    (Ginseng, Poria, and Atractylodes Macrocephala Powder)
  - *Xiao Chai Hu Tang*
    (Minor Bupleurum Decoction)
  - Personalized formulas

An YW, Yuan B, Wang JC, et al. Clinical characteristics and impacts of traditional Chinese medicine treatment on the convalescents of COVID-19. *Int J Med Sci*. 2021;18(3):646-651. Published 2021 Jan 1. doi:10.7150/ijms.52664

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

- *Chai Hu* (Radix Bupleuri) 24g [12g]
- *Huang Qin* (Radix Scutellariae) 9g [9g]
- *Ban Xia* (Rhizoma Pinelliae), 0.5 cup [9g]
- *Sheng Jiang* (Rhizoma Zingiberis Recens), 9g [9g]
- *Ren Shen* (Radix et Rhizoma Ginseng) 9g [6g]
- *Zhi Gan Cao* (Radix et Rhizoma Glycyrrhizae Praeparata cum Melle) 9g [5g]
- *Da Zao* (Fructus Jujubae), *bo* (opened) 12 pieces [4 pieces]

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

- *Shaoyang* syndrome: alternating spells of fever and chills, chest and hypochondriac fullness and discomfort, irritability, a bitter taste in the mouth, lack of appetite, nausea, vomiting, vertigo, a dry throat, a thin, white tongue coating, and a wiry pulse.
- Any disorder with *shaoyang* characteristics: gynecological disorders with heat in the uterus, Liver, or *chong* (thoroughfare) channel; malaria; jaundice; or any internal injury characterized by *shaoyang* syndrome.

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

- Hepatitis, viral hepatitis, chronic hepatitis, hepatic fibrosis and carcinoma, hepatocellular carcinomas, jaundice, cholecystitis, cholelithiasis, pancreatitis, fever, fever in cancer, nephritis, chronic renal insufficiency, acute tonsillitis, infectious parotitis, stomatitis, common cold, influenza, measles, bronchitis, pneumonia, pulmonary tuberculosis, cough, allergic rhinitis, bronchial asthma, reflux esophagitis, antral gastritis, gastritis, gastric pain, gastric prolapse, constipation, Meniere's syndrome, dizziness, seizures, migraine, angina, depression, chronic fatigue syndrome, morning sickness, postpartum infection, postpartum fever, dysmenorrhea, premenstrual syndrome, and malaria.

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

- Harmonizes *shaoyang*

- Hepatoprotective
- Cholagogic
- Immunostimulant
- Anti-inflammatory
- Temperature regulation
- Gastrointestinal and antiulcer
- Antiallergic
- Antitumor and antimetastatic
- Radioprotective

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

Table 2. Comparison of blood biochemistry indices between different treatments in COVID-19 convalescents

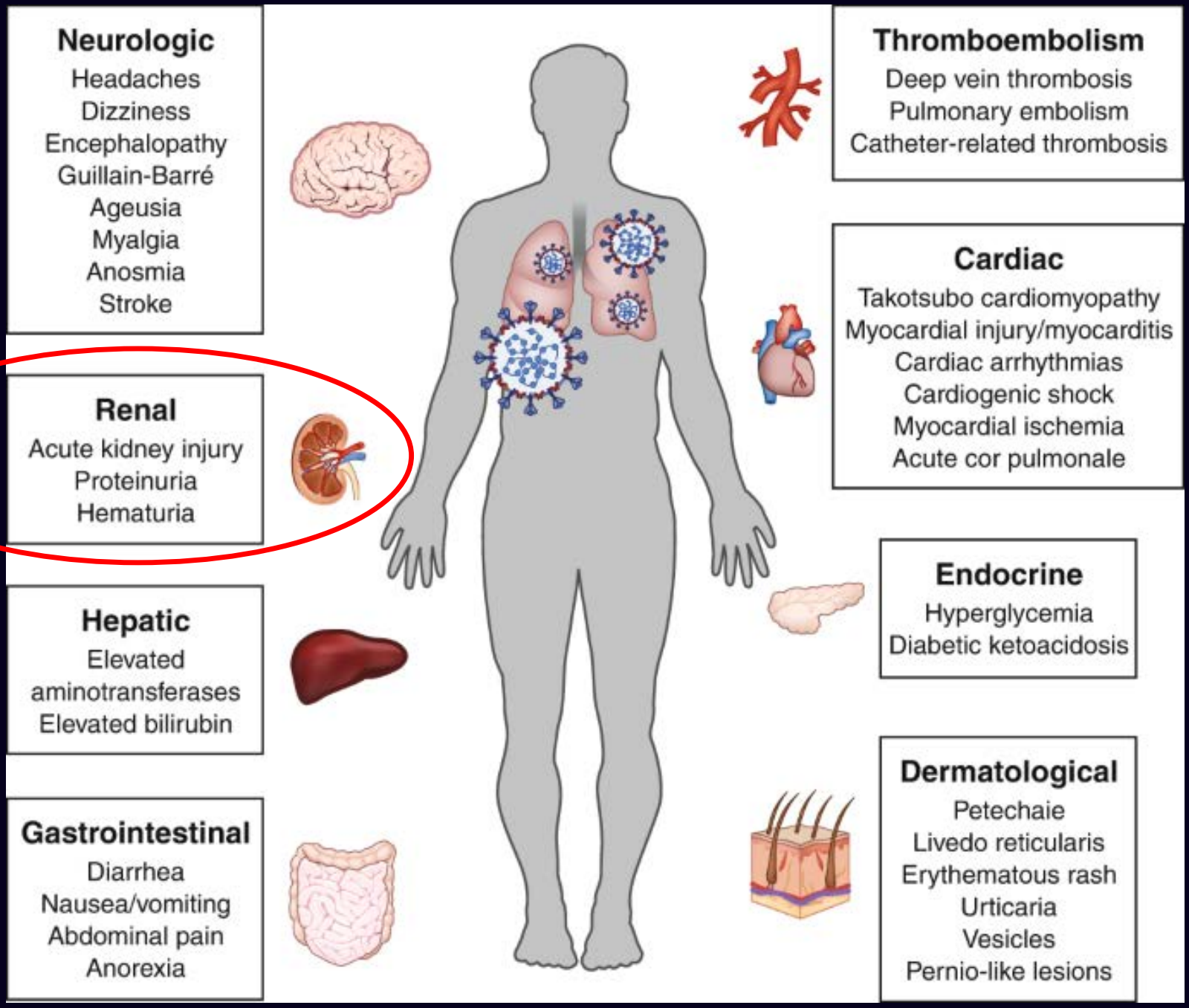
Indices	Reference range	Non-treatment (n = 425)	TCM treatment (n = 143)	*P* value
Liver function				
GLB (g/L)	20-40	26.81±4.66	26.61±3.83	0.6427
A/G	1.5-2.5	1.75±0.31	1.79±0.30	0.1587
AST/ALT	0.5-1.5	1.42±0.64	1.36±0.63	0.3558
GGT (U/L)	7-60	35.10±33.06	27.31±18.13**↓	0.0088
ALT (U/L)	7-50	20.70±19.87	20.55±16.36	0.9398
TBA (μmol/L)	0-10	7.09±6.74	7.82±4.54	0.2386
PA (g/L)	0.2-0.4	0.29±0.06	0.35±0.62*↑	0.0492
ALB (g/L)	35-52	45.68±4.11	46.66±2.85**↑	0.0098
TP (g/L)	65-85	72.50±4.71	73.27±3.89	0.0818

An YW, Yuan B, Wang JC, et al. Clinical characteristics and impacts of traditional Chinese medicine treatment on the convalescents of COVID-19. *Int J Med Sci*. 2021;18(3):646-651. Published 2021 Jan 1. doi:10.7150/ijms.52664

小柴胡汤 *Xiǎo Chái Hú Tāng* (Minor Bupleurum Decoction)

- “the present study suggested that TCM is safe for convalescent COVID-19 patients and has some protective effects on the liver.”

An YW, Yuan B, Wang JC, et al. Clinical characteristics and impacts of traditional Chinese medicine treatment on the convalescents of COVID-19. *Int J Med Sci*. 2021;18(3):646-651. Published 2021 Jan 1. doi:10.7150/ijms.52664



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Original article

Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu *

School of Life Sciences, Beijing University of Chinese Medicine, Beijing, China

- "Chinese Herbal Medicine (CHM) has rich experience in treating renal injury and has successfully applied in China in the battle of COVID-19. Nevertheless, the molecular mechanisms of CHM treatment are still unclear. In this study, we searched prescriptions in the treatment of renal injury extensively and the potential mechanisms to treat COVID-19 related renal injury were investigated."

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Kidney Dysfunctions

- COVID-19 and revealed that a remarkable fraction of patients had signs of kidney dysfunctions:
  - 59% with proteinuria
  - 44% with hematuria
  - 14% with increased blood urea nitrogen
  - 10% with increased serum creatinine
  - 29% with acute renal injury

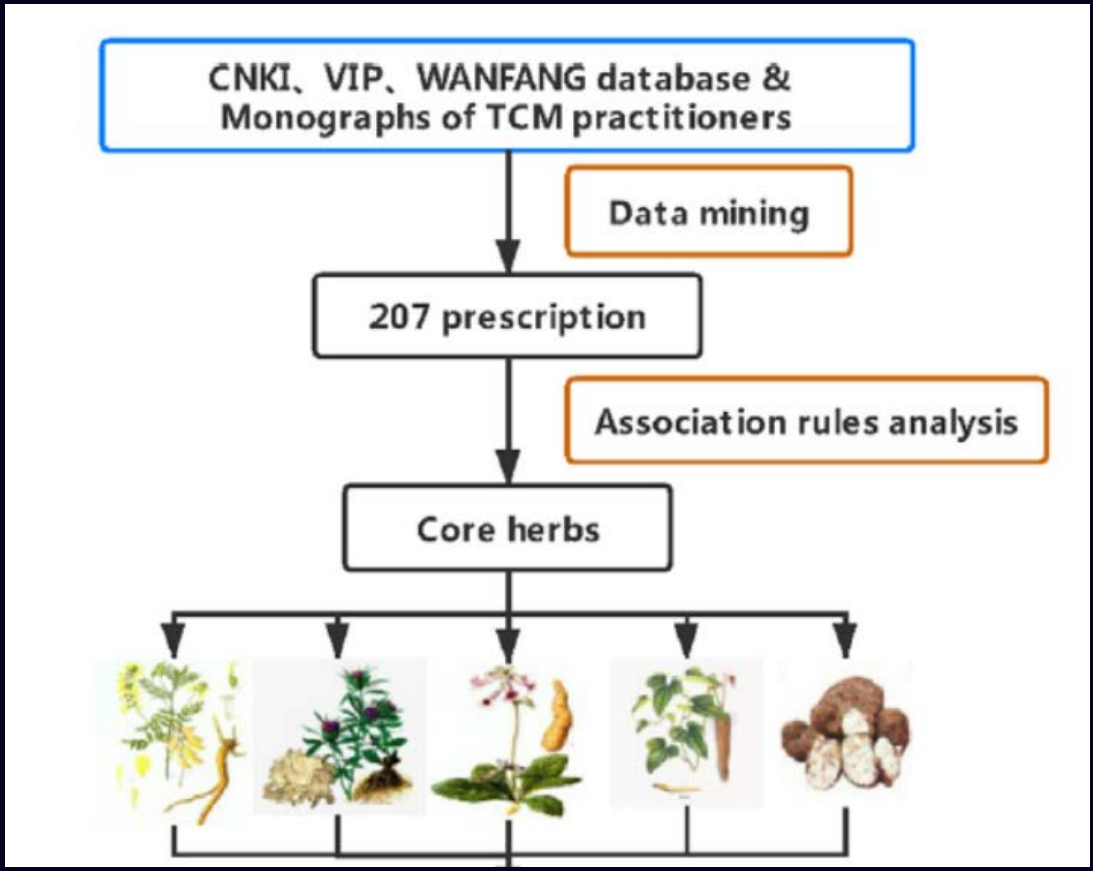
Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Pathological Injuries

- Tubular epithelial cells degeneration and shedding
- Renal interstitial congestion,
- Microthrombi and focal fibrosis observed in autopsy

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Core Herbs



Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Core Herbs

Table 1
Frequency statistics of herbs associated with the treatment of renal injury.

No.	Herbs	Frequency	Percentage (%)
01	*Radix Astragali* (Huang Qi)	79	34.30
02	*Poria* (Fu Ling)	71	25.60
03	*Rhizoma Atractylodis macrocephalae* (Bai Zhu)	53	19.32
04	*Radix Rehmanniae* (Di Huang)	43	17.87
05	*Dioscoreae Rhizoma* (Shan Yao)	39	16.91
06	*Radix Salviae liguliobae* (Dan Shen)	35	16.91
07	*Rhizoma Alismatis* (Ze Xie)	35	16.43
08	*Herba Leonuri* (Yi Mu Cao)	34	14.98
09	*Radix Glycyrrhizae* (Gan Cao)	32	13.53
10	*Fructus Corni* (Shan Zhu Yu)	31	13.53
11	*Semen Plantaginis* (Che Qian Zi)	28	13.04
12	*Radix Angelicae sinensis* (Dang Gui)	27	12.56
13	*Rhizoma Imperatae* (Bai Mao Gen)	27	11.59
14	*Radix Aconiti Lateralis* (Fu Zi)	24	10.14
15	*Radix et Rhizoma Rhei(Da Huang)*	20	09.66

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Main Categories

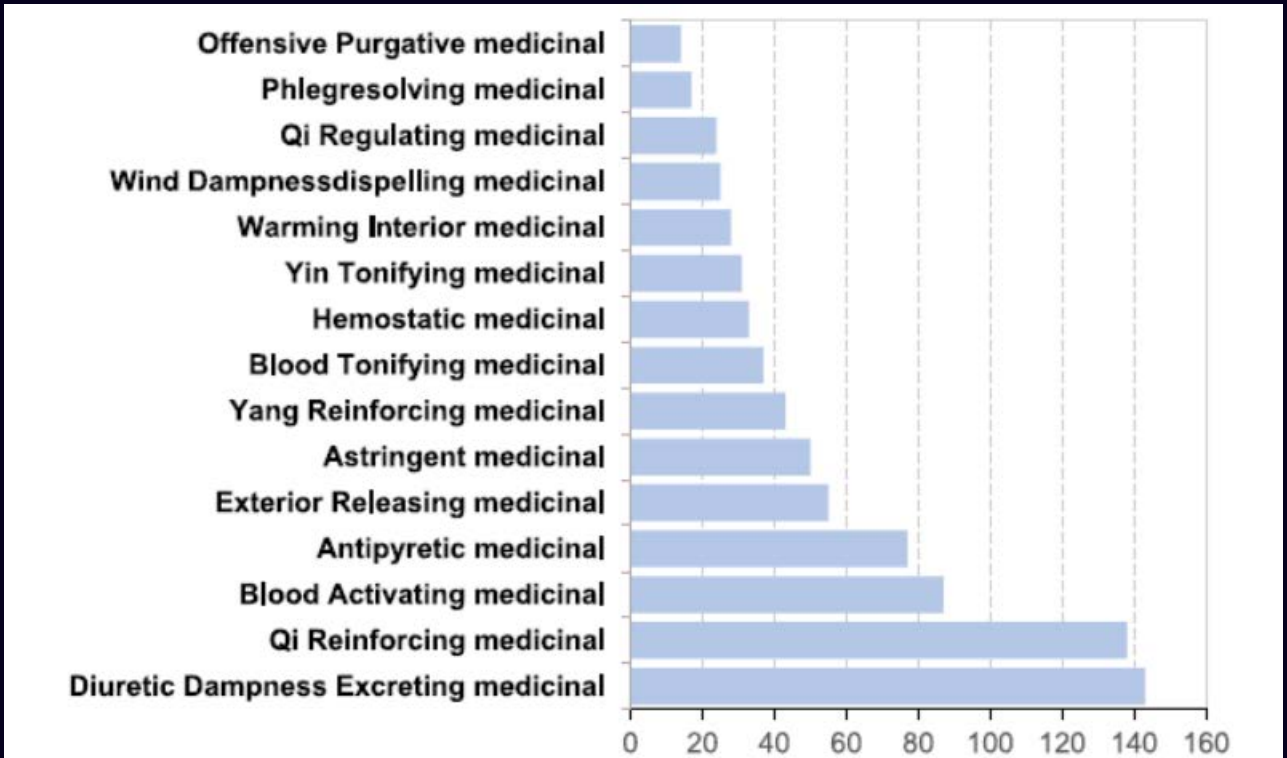


Fig. 2. Frequency of different CHM herb types in 207 prescriptions.

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

黄芪 *Huáng Qí* (Radix Astragali)

- Tonifies qi and raises yang
- Tonifies *wei* (defensive) *qi*, consolidates the exterior
- Promotes the discharge of pus and generates flesh
- Regulates water circulation, reduces edema

黄芪 *Huáng Qí* (Radix Astragali)

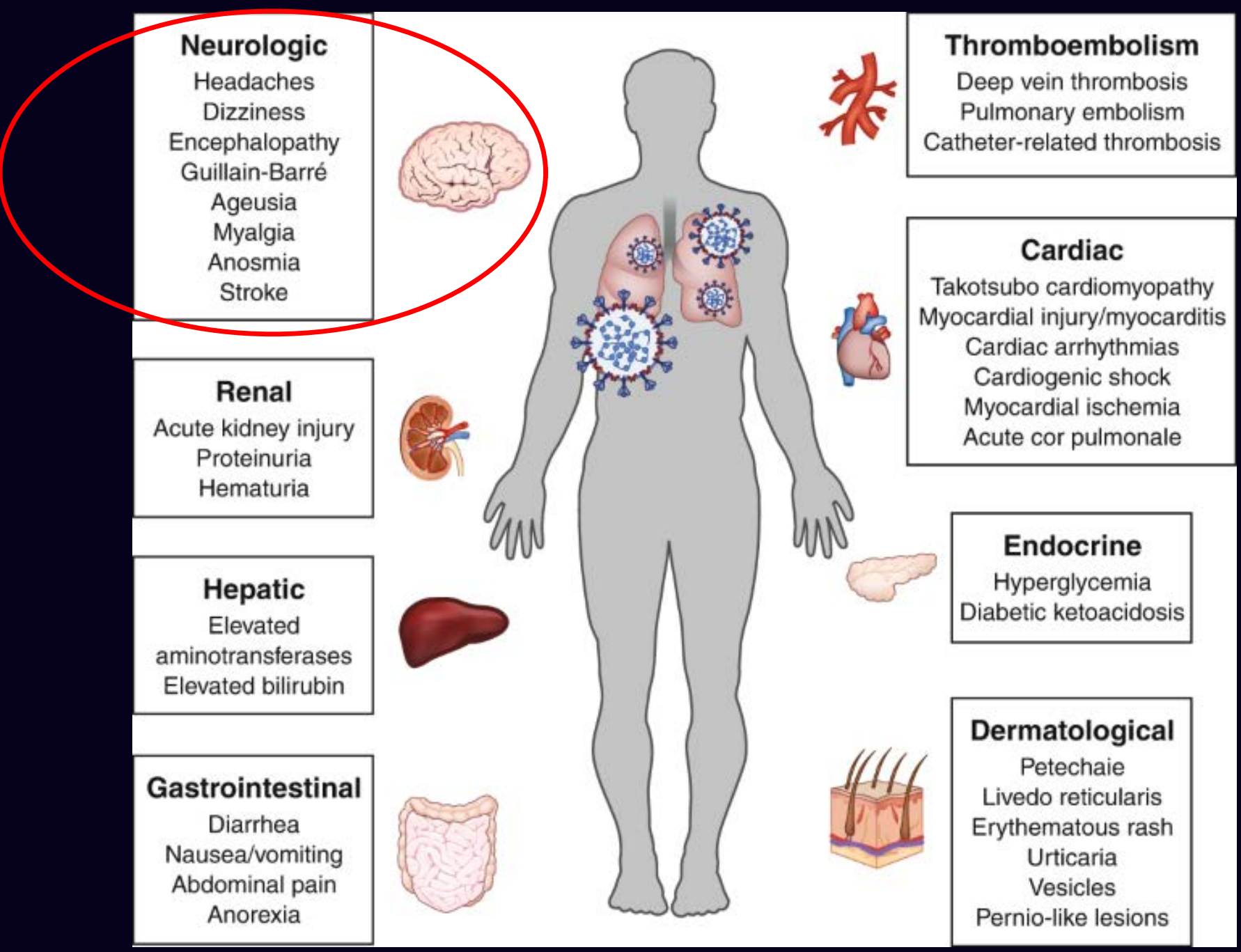
- Therapeutic effect in renal dysfunction and pathological changes:
  - Reduces renal inflammation by inhibiting interleukin, TNF-alpha and Cox-2
  - Alleviate the apoptosis and necrosis of renal cells
  - Ameliorates renal fibrosis via the inhibition of CASP3 activation

Tian He, Rendong Qu, Caimeng Qin, Zheyi Wang, Yue Zhang, Xiangming Shao, Tao Lu. Potential mechanisms of Chinese Herbal Medicine that implicated in the treatment of COVID-19 related renal injury, Saudi Pharmaceutical Journal, Volume 28, Issue 9, 2020, Pages 1138-1148.

Herbal Formulas for Renal Dysfunction

- *Wu Ling San* (Five-Ingredient Powder with Poria)
- *Wu Pi Yin* (Five-Peel Decoction)
- *Bi Xie Fen Qing Yin* (Dioscorea Hypoglauca Decoction to Separate the Clear)
- *Yue Bi Jia Zhu Tang* (Maidservant from Yue Decoction plus Atractylodes)
- *Liu Wei Di Huang Wan* (Six-Ingredient Pill with Rehmannia)
- *Jin Gui Shen Qi Wan* (Kidney Qi Pill from the Golden Cabinet)
- *Zhi Bai Di Huang Wan* (Anemarrhena, Phellodendron, and Rehmannia Pill)

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009



https://www.nature.com

Anosmia and Ageusia

- Anosmia (loss of smell)
- Ageusia (loss of taste)
  - 13% with total loss in post Covid patients
  - 44% with partial loss in post Covid patients

Bevyn Jarrott, et al. "LONG COVID"—A hypothesis for understanding the biological basis and pharmacological treatment strategy, Pharmacology Research & Perspectives, **10**, 1, (2022).Al-Rawi NH, Sammouda AR, AlRahin EA, Ali FAA, Arayedh GSA, Daryanavard HA, Saeed MH, Nuaimi ASA. Prevalence of Anosmia or Ageusia in Patients With COVID-19 Among United Arab Emirates Population. Int Dent J. 2022 Apr;72(2):249-256. doi: 10.1016/j.identj.2021.05.006. Epub 2021 May 24. PMID: 34226066; PMCID: PMC8141716.

Anosmia and Ageusia

- The nerves do not have ACE-2 receptors and are not directly affected.
- The supporting cells around nerves (smell and taste) have ACE-2 receptors and when infected/inflammed they damage the nerve and therefore affect smell and taste.

Bevyn Jarrott, et al. "LONG COVID"—A hypothesis for understanding the biological basis and pharmacological treatment strategy, Pharmacology Research & Perspectives, **10**, 1, (2022).Al-Rawi NH, Sammouda AR, AlRahin EA, Ali FAA, Arayedh GSA, Daryanavard HA, Saeed MH, Nuaimi ASA. Prevalence of Anosmia or Ageusia in Patients With COVID-19 Among United Arab Emirates Population. Int Dent J. 2022 Apr;72(2):249-256. doi: 10.1016/j.identj.2021.05.006. Epub 2021 May 24. PMID: 34226066; PMCID: PMC8141716.

Anosmia and Ageusia

- *Pu Ji Xiao Du Yin* (Universal Benefit Decoction to Eliminate Toxin)
- *Xin Yi San* (Magnolia Flower Powder)
- *Cang Er Zi San* (Xanthium Powder)
- *Qing Bi Tang* (Clear the Nose Decoction)
- *Tong Qiao Huo Xue Tang* (Unblock the Orifices and Invigorate the Blood Decoction)

Cognitive Impairment (Brain Fog)

- Brain fog, a term used to describe slow or sluggish thinking, can occur under many different circumstances, including Covid-19.
- 22% to 32% of patients suffer from brain fog after Covid-19 recovery

Fong, Tamara. Brain fog: Memory and attention after Covid-19. March 17, 2022. Harvard Health Publishing. Harvard Medical School.

Cognitive Impairment (Brain Fog)

- Clinical Findings:
  - Virus is NOT in the brain
  - Chronic inflammation
  - Blood vessel damage
  - BBB damage

益气聪明汤 *Yì Qì Cōng Míng Tāng* (Augment the Qi and Increase Acuity Decoction)

- *Ren Shen* (Radix et Rhizoma Ginseng), 15g
- *Huang Qi* (Radix Astragali), 15g
- *Ge Gen* (Radix Puerariae Lobatae), 9g
- *Sheng Ma* (Rhizoma Cimicifugae), 9g
- *Man Jing Zi* (Fructus Viticis), 4.5g
- *Bai Shao* (Radix Paeoniae Alba), 3g
- *Huang Bo* (Cortex Phellodendri Chinensis), 3g
- *Zhi Gan Cao* (Radix et Rhizoma Glycyrrhizae Praeparata cum Melle), 15g

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009
http://www.takungpao.com/life/238151/2022/0330/703219.html
https://heho.com.tw/archives/222138

益气聪明汤 *Yì Qì Cōng Míng Tāng* (Augment the Qi and Increase Acuity Decoction)

- Compromised visual and auditory functions: diminished acuity of eyes and ears, blurred vision, dizziness, light-headedness, decreased appetite, spontaneous sweating, and chronic diarrhea.
- Cognitive dysfunction, cerebral arteriosclerosis, tinnitus, deafness, diminished vision, cataract, vertigo, otitis media, and ulcerative colitis.

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009
http://www.takungpao.com/life/238151/2022/0330/703219.html
https://heho.com.tw/archives/222138

益气聪明汤 *Yì Qì Cōng Míng Tāng* (Augment the Qi and Increase Acuity Decoction)

- Tonifies qi and blood
- Lifts yang qi and benefits the eyes and ears

- None found

Chen J. and Chen T. Chinese Herbal Formulas and Applications. Art of Medicine Press, Inc. 2009
http://www.takungpao.com/life/238151/2022/0330/703219.html
https://heho.com.tw/archives/222138

Cognitive Impairment (Brain Fog)

- Needle: 百会 *Baihui* (GV 20), 四神聪 *Sishencong* (Ex-HN1), 印堂 *Yintang* (Ex-HN3), 神庭 *Shenting* (GV 24)
- Massage: 百会 *Baihui* (GV 20) + 大椎 *Dazhui* (GV 14) + scalp
- Ear: *Shenmen*, Heart, Brain, Liver, Kidney

http://www.takungpao.com/life/238151/2022/0330/703219.html
https://heho.com.tw/archives/222138
https://www.edh.tw/article/30997

TCM Rehabilitation

八段錦 *Bā Duàn Jǐn*
(The Eight Brocades)

太极拳 *Tài Jí Quán*

https://www.elotus.org/course/post-covid-syndrome-and-tcm-treatment

www.eLOTUS.org

Original Article

Modified rehabilitation exercises for mild cases of COVID-19

Lulu Zha[1,2], Xi Xu[1,2], Dongya Wang[1,2], Guibin Qiao[3,4], Weitao Zhuang[3,4]^, Shujie Huang[3,4]^

- COVID-19 patients shows that alveoli injuries and interstitial changes are the major mechanisms of impaired O2/CO2 exchange. Few rehabilitation exercises concerning COVID-19 patients were reported. Here, we present a modified version of rehabilitation exercises based on the underlying mechanism of the disease to mild cases of COVID-19. These exercises aimed to improve the pulmonary function of patients and ease the expectoration process.
- Acupressure was integrated into the exercises to facilitate the recovery and maintenance of pulmonary function.

Lulu Zha, Xi Xu, Dongya Wang, Guibin Qiao, Weitao Zhuang, Shujie Huang. Modified rehabilitation exercises for mild cases of COVID-19. Annals of Palliative Medicine. Vol 9, No 5, September 2002.

八段錦 *Bā Duàn Jǐn* (Eight Section Brocade)

- Full-body exercise designed to reduce total airway resistance, smooth fresh airflow and improve O2/CO2 exchange efficiency.
  - Article: https://apm.amegroups.com/article/view/49130/html
  - Video: https://apm.amegroups.com/article/view/49130/html?wvideo=ss83nz9p34

Lulu Zha, Xi Xu, Dongya Wang, Guibin Qiao, Weitao Zhuang, Shujie Huang. Modified rehabilitation exercises for mild cases of COVID-19. Annals of Palliative Medicine. Vol 9, No 5, September 2002.

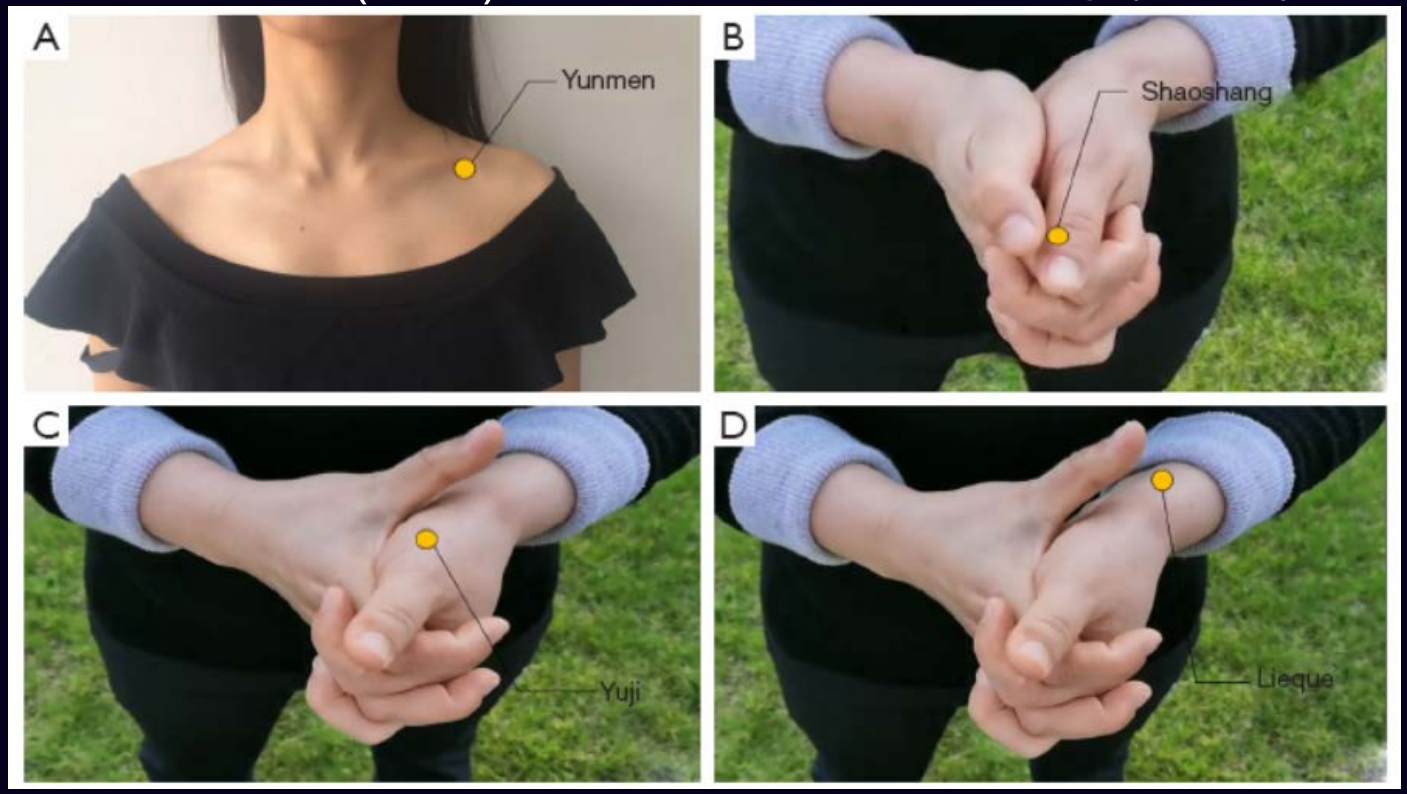
八段錦 *Bā Duàn Jǐn* (Eight Section Brocade)

Lulu Zha, Xi Xu, Dongya Wang, Guibin Qiao, Weitao Zhuang, Shujie Huang. Modified rehabilitation exercises for mild cases of COVID-19. Annals of Palliative Medicine. Vol 9, No 5, September 2002.

Acupressure Points

Yunmen (LU 2)

Shaoshang (LU 11)



Yuji (LU 10)

Lieque (LU 7)

Lulu Zha, Xi Xu, Dongya Wang, Guibin Qiao, Weitao Zhuang, Shujie Huang. Modified rehabilitation exercises for mild cases of COVID-19. Annals of Palliative Medicine. Vol 9, No 5, September 2002.

Results

	Dry cough	Productive Cough	Difficulty in expectoration	Dyspnea
Baseline	41.70%	43.30%	35%	50%
After 1 month	11.70%	11.70%	8.30%	15%

- In total, 60 confirmed mild COVID-19 cases were enrolled with a median age of 54 years old. The pronounced decline in symptom prevalence was recorded over time.
- Four weeks after discharge, we noticed a lower remission rate in productive cough and difficulty in expectoration.

Lulu Zha, Xi Xu, Dongya Wang, Guibin Qiao, Weitao Zhuang, Shujie Huang. Modified rehabilitation exercises for mild cases of COVID-19. Annals of Palliative Medicine. Vol 9, No 5, September 2002.

张伯礼 Zhāng Bólǐ

- Address both physical and physiological concerns
- Focus on the organs (lungs, heart, kidney, brain, etc) and their functions
- Utilize all TCM tools
- May take up to 1 year for full recovery
- Avoid infections if at all possible

https://baijiahao.baidu.com/s?id=1673261483252009776&wfr=spider&for=pc

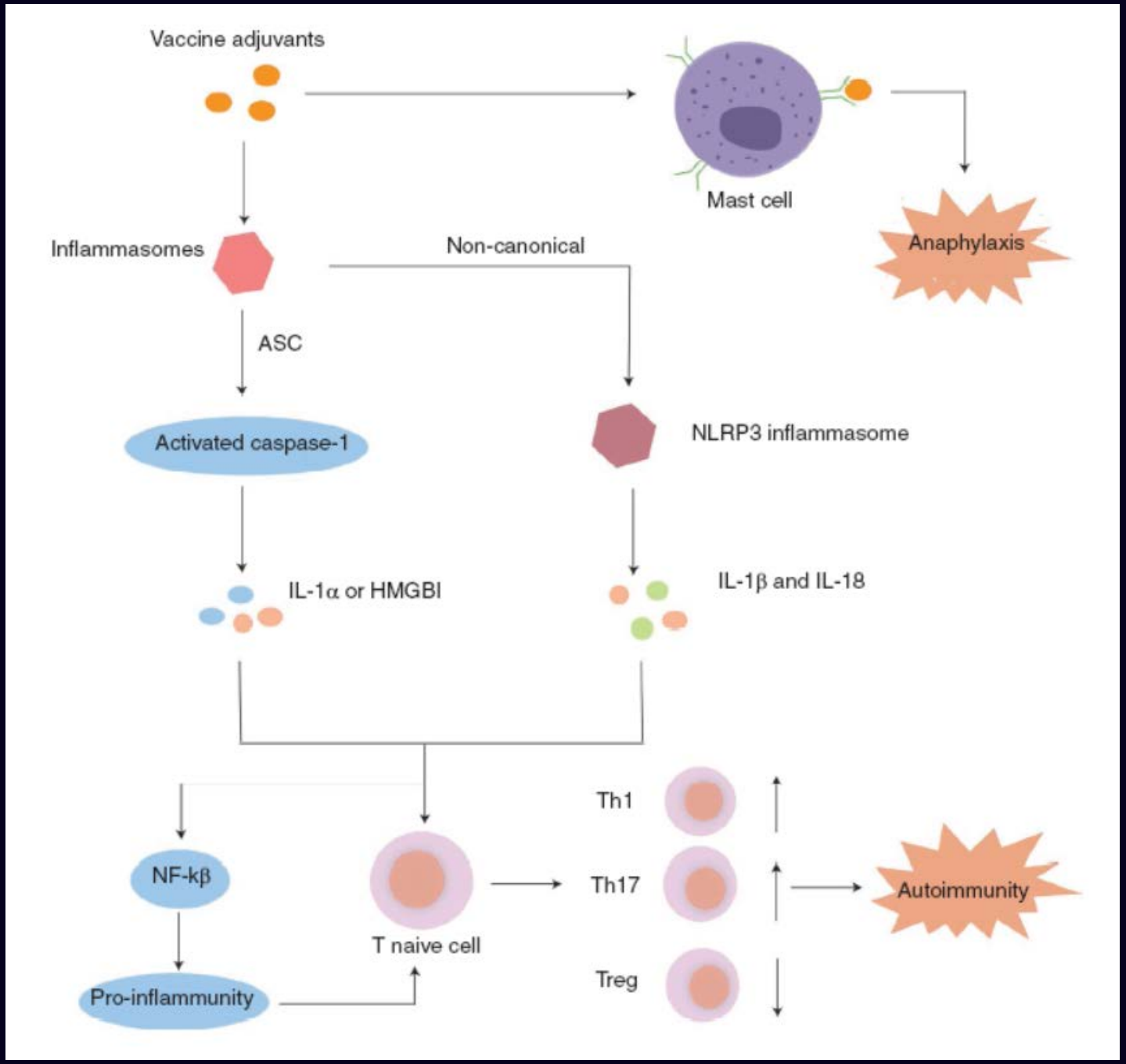
BMJ Open

Side effects of COVID-19 vaccines: a systematic review and meta-analysis protocol of randomised trials

Kleyton Santos Medeiros,[1,2] Ana Paula Ferreira Costa,[1] Ayane Cristine Alves Sarmento,[1] Cijara Leonice Freitas,[1] Ana Katherine Gonçalves [3]

Table 2 Adverse events of COVID-19 vaccines

Adverse events	
Systemic event reactions (10, 11)	Fever or hyperthermia or feverish, headaches, fatigue, vomiting, diarrhoea, muscle pain, joint pain, cough, nausea, dyspnoea, appetite impaired, dizziness, mucosal abnormality, pruritus,[27 28] hypersensitivity, syncope,[27] asthenia, rhinorrhoea, malaise, sore throat (throat irritation), pain in the oropharynx (pharyngalgia), hives, nasal congestion[29 30]
Injection site adverse reactions (10–12)	Pain, induration, redness or erythema, swelling, itch, muscular weakness[27–29]
Serious vaccine-related adverse event	Deaths, hospitalisation,[30] thrombotic complications[31 32]


Vaccine adjuvants
Mast cell
Anaphylaxis
Inflammasomes
Non-canonical
ASC
Activated caspase-1
NLRP3 inflammasome
IL-1α or HMGBI
IL-1β and IL-18
Th1
NF-kβ
T naive cell
Th17
Autoimmunity
Treg
Pro-inflammunity

frontiers | Frontiers in Immunology

ORIGINAL RESEARCH
published: 27 May 2022
doi: 10.3389/fimmu.2022.899526

Autoimmune Skin Disease Exacerbations Following COVID-19 Vaccination

Grant Sprow[1,2], *Mohsen Afarideh*[1,2], *Joshua Dan*[1,2], *Rui Feng*[3], *Emily Keyes*[1,2], *Madison Grinnell*[1,2], *Josef Concha*[1,2] *and Victoria P. Werth*[1,2*]

[1] *Dermatology, Corporal Michael J. Crescenz Department of Veterans Affairs Medical Center, Philadelphia, PA, United States,* [2] *Dermatology, Perelman School of Medicine, University of Pennsylvania, Philadelphia, PA, United States,* [3] *Department of Biostatistics, Epidemiology, and Informatics, University of Pennsylvania, Philadelphia, PA, United States*

Received: 14 September 2021 | Revised: 21 October 2021 | Accepted: 22 October 2021

DOI: 10.1002/ccr3.5099

Clinical Case Reports Open Access WILEY

CASE REPORT

Stevens-Johnson Syndrome due to COVID-19 vaccination

Parvin Mansouri[1,2] | **Reza Chalangari**[3] | **Katalin Martits-Chalangari**[3] | **Nikoo Mozafari**[4,5]

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[2]Medical Laser Research Centers, Academic Center for Education, Culture and Research, Tehran University of Medical Sciences, Tehran, Iran

[3]Kassir Dermatology, Dallas, TX, USA

[4]Skin Research Center, Shahid Beheshti University of Medical Sciences, Tehran, Iran

[5]Department of Dermatology, Loghman Hakim Hospital, Shahid Beheshti University of Medical Sciences, Tehran, Iran

ELSEVIER

Clinical Immunology Communications

Volume 2, December 2022, Pages 1-5

Review Article

Guillain-Barre syndrome: An autoimmune disorder post-COVID-19 vaccination?

Zafran Khan [a, b, c, 1], Ubaid Ahmad [c, 1], Daniya Ualiyeva [b, d, e, 1], Obed Boadi Amissah [b], Asaf Khan [f], Zohaib Noor [g, h], Nasib Zaman [c]

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https://doi.org/10.1016/j.clicom.2021.12.002

Clinical Rheumatology (2022) 41:1603–1609
https://doi.org/10.1007/s10067-022-06149-4

PERSPECTIVES IN RHEUMATOLOGY

Autoimmune post-COVID vaccine syndromes: does the spectrum of autoimmune/inflammatory syndrome expand?

Luis J. Jara[1,2] · Olga Vera-Lastra[2,3] · Naim Mahroum[4] · Carlos Pineda[5] · Yehuda Shoenfeld[6]

Received: 16 March 2022 / Revised: 16 March 2022 / Accepted: 23 March 2022 / Published online: 5 April 2022

Abstract

To date, around 60% of the world population has been protected by vaccines against SARS-CoV-2, significantly reducing the devastating effect of the pandemic and restoring social economic activity through mass vaccination. Multiple studies have demonstrated the effectiveness and safety of vaccines against COVID-19 in healthy populations, in people with risk factors, in people with or without SARS-CoV-2 infection, and in immunocompromised people. According to the criteria for post-vaccine adverse events established by the World Health Organization, a minority of individuals may develop adverse events, including autoimmune syndromes. The exact mechanisms for the development of these autoimmune syndromes are under study, and to date, a cause-effect relationship has not been established. Many of these autoimmune syndromes meet sufficient criteria for the diagnosis of Adjuvant-Induced Autoimmune Syndrome (ASIA syndrome). The descriptions of these autoimmune syndromes open new perspectives to the knowledge of the complex relationship between the host, its immune system, with the new vaccines and the development of new-onset autoimmune syndromes. Fortunately, most of these autoimmune syndromes are easily controlled with steroids and other immunomodulatory medications and are short-lived. Rheumatologists must be alert to the development of these autoimmune syndromes, and investigate the relationship between autoimmune/inflammatory symptoms and vaccination time, and assess their therapeutic response.

Received: 8 October 2021 | Accepted: 22 December 2021

DOI: 10.1111/imm.13443

immunology
Insights into immunity in health and disease

REVIEW

New-onset autoimmune phenomena post-COVID-19 vaccination

Yue Chen[1,2] | Zhiwei Xu[3] | Peng Wang[4] | Xiao-Mei Li[5] | Zong-Wen Shuai[6] | Dong-Qing Ye[1,2] | Hai-Feng Pan[1,2]

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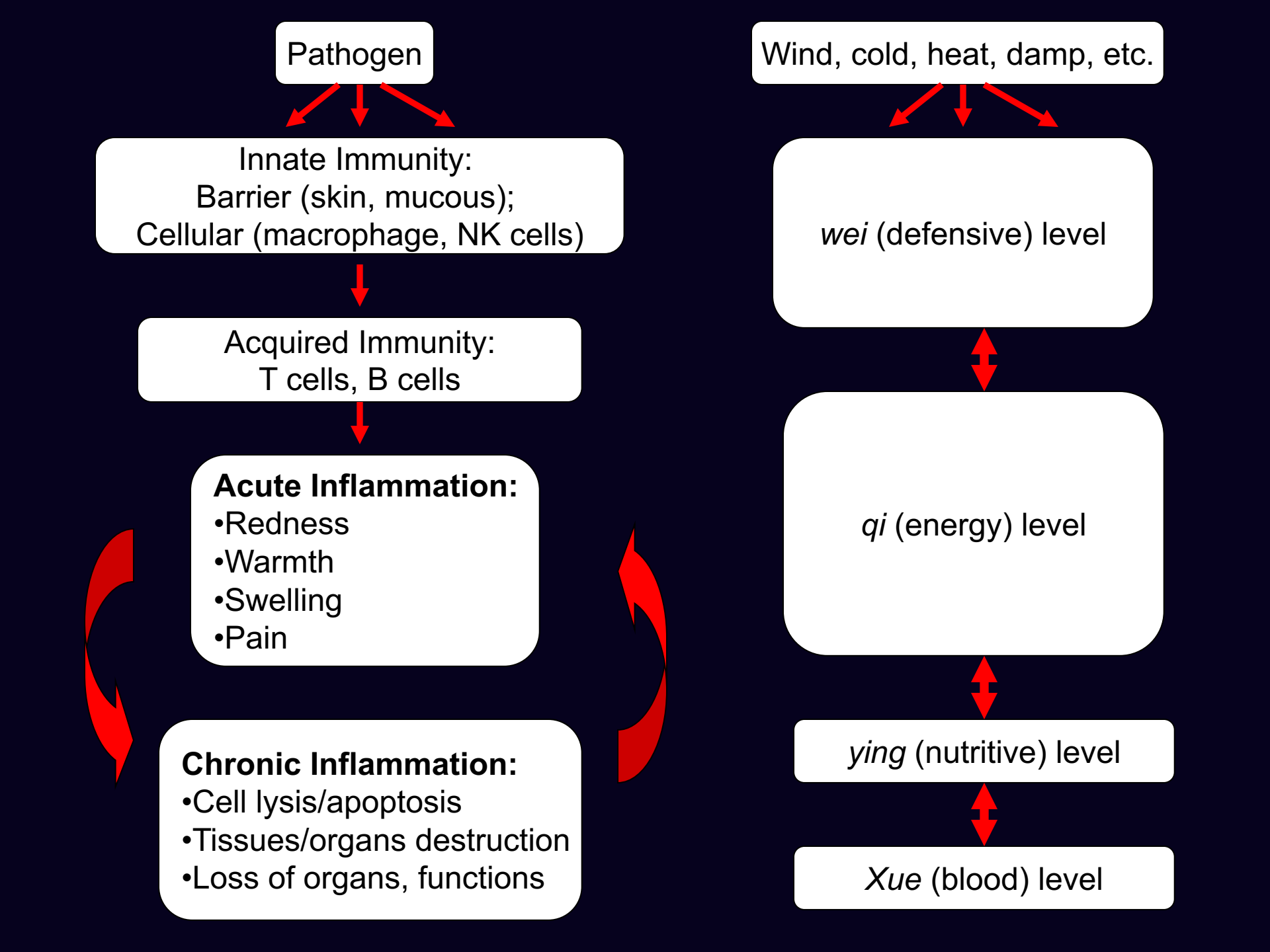
[6]Department of Rheumatology and Immunology, The First Affiliated Hospital of Anhui Medical University, Hefei, China

New-onset autoimmune phenomena post-COVID-19 vaccination

Abstract

Coronavirus disease 2019 (COVID-19) pandemic caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has led to an unprecedented setback for global economy and health. Vaccination is one of the most effective interventions to substantially reduce severe disease and death due to SARS-CoV-2 infection. Vaccination programmes are being rolled out globally, but most of these vaccines have been approved without extensive studies on their side-effects and efficacy. Recently, new-onset autoimmune phenomena after COVID-19 vaccination have been reported increasingly (e.g. immune thrombotic thrombocytopenia, autoimmune liver diseases, Guillain–Barré syndrome, IgA nephropathy, rheumatoid arthritis and systemic lupus erythematosus). Molecular mimicry, the production of particular autoantibodies and the role of certain vaccine adjuvants seem to be substantial contributors to autoimmune phenomena. However, whether the association between COVID-19 vaccine and autoimmune manifestations is coincidental or causal remains to be elucidated. Here, we summarize the emerging evidence about autoimmune manifestations occurring in response to certain COVID-19 vaccines. Although information pertaining to the risk of autoimmune disease as a consequence of vaccination is controversial, we merely propose our current understanding of autoimmune manifestations associated with COVID-19 vaccine. In fact, we do not aim to disavow the overwhelming benefits of mass COVID-19 vaccination in preventing COVID-19 morbidity and mortality. These reports could help guide clinical assessment and management of autoimmune manifestations after COVID-19 vaccination.

Chen Y, Xu Z, Wang P, Li XM, Shuai ZW, Ye DQ, Pan HF. New-onset autoimmune phenomena post-COVID-19 vaccination. Immunology. 2022 Apr;165(4):386-401. doi: 10.1111/imm.13443. Epub 2022 Jan 7. PMID: 34957554.


Pathogen
Innate Immunity:
Barrier (skin, mucous);
Cellular (macrophage, NK cells)
Acquired Immunity:
T cells, B cells
Acute Inflammation:
•Redness
•Warmth
•Swelling
•Pain
Chronic Inflammation:
•Cell lysis/apoptosis
•Tissues/organs destruction
•Loss of organs, functions
Wind, cold, heat, damp, etc.
wei (defensive) level
qi (energy) level
ying (nutritive) level
Xue (blood) level

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John Chen, Pharm.D., Ph.D., O.M.D., L.Ac.

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www.eLotus.org

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covid-19 and traditional chinese medicine

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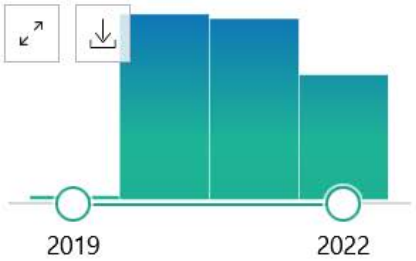

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Treatment Mechanism Transmission More filters

See more SARS-CoV-2 literature, sequence, and clinical content from NCBI

1 **Traditional Chinese Medicine** (TCM) in the treatment of **COVID-19** and other viral infections: Efficacies and mechanisms.

UCLA Clinical Trial - mQFPD

Study Design Go to

Study Type :	Interventional (Clinical Trial)
Estimated Enrollment :	66 participants
Allocation:	Randomized
Intervention Model:	Parallel Assignment
Masking:	Triple (Participant, Care Provider, Investigator)
Primary Purpose:	Treatment
Official Title:	Multicenter Double Blind, Placebo Controlled RCT of Modified Qing Fei Pai Du Tang (mQFPD) for COVID-19
Actual Study Start Date :	July 1, 2021
Estimated Primary Completion Date :	July 1, 2022
Estimated Study Completion Date :	December 31, 2022

https://clinicaltrials.ucbraid.org/trial/NCT04939415
https://clinicaltrials.gov/ct2/show/NCT04939415

Medical News & Perspectives

Trials Test Mushrooms and Herbs as Anti–COVID-19 Agents

Anita Slomski

In the COVID-19 pandemic's early days, integrative medicine specialists Gordon Saxe, MD, PhD, MPH, and Andrew Shubov, MD, watched in frustration as desperate patients infected with the novel coronavirus tried one ineffective remedy after another. "People were taking increasingly toxic drugs, and nothing was working," Shubov said in an interview.

Missing from those early hit-or-miss therapeutics, however, were traditional medicines such as Chinese herbs and medicinal mushrooms. The omission was glaring to Saxe, an epidemiologist and executive director of the Krupp Center for Integrative Research at the University of California San Diego (UCSD), whose research focuses on using food as medicine. Shubov, director of Inpatient Integrative Medicine, Center for East-West Medicine, at the University of California Los Angeles (UCLA), also found it a stark oversight.

So in April 2020, they applied to the US Food and Drug Administration (FDA) for approval to conduct 2 randomized phase 1 trials. The double-blind, placebo-controlled studies would evaluate the safety and feasibility of treating mild to moderate COVID-19 with either medicinal mushrooms, which have a long history as natural therapeutics for pulmonary disease, or a Chinese herb formulation from Taiwan that's widely used as a COVID-19 remedy in China.

The FDA ultimately sanctioned the MACH-19 (Mushrooms and Chinese Herbs for COVID-19) trials, which are now underway at UCLA and UCSD and are supported by the Krupp Endowed Fund. Meanwhile, a third MACH-19 trial is investigating the use of medicinal mushrooms as an adjuvant to COVID-19 vaccines.

"Researchers are currently conducting in vitro and animal studies with natural products to evaluate direct antiviral activity or to address COVID-19 sequelae," D. Craig Hopp, PhD, deputy director of the Division of Extramural Research at the National Center for Complementary and Integrative Health (NCCIH), said in an interview. But the MACH-19 treatment trials are unique, he noted, because they're evaluating natural products among humans with acute SARS-CoV-2 infection.

Paul Stamets/Fungi Perfecti

Medicinal Mushrooms Sprout Interest

The first trial is studying a combination of 2 mushrooms—turkey tail (*Trametes versicolor*) and agarikon (*Fomitopsis officinalis*)—both of which are available as over-the-counter supplements.

According to Saxe, the MACH-19 trials' principal investigator, it's biologically plausible that mushrooms may have immune-modulating properties against SARS-CoV-2. "The interactions of fungi as part of the gut microbiome include binding to receptors on immune cells," he explained in an interview. "There are receptors on T cells, for example, that bind mushroom polysaccharides. This is one mechanism by which mushrooms can modulate the behavior of our immune cells, which may have a potential effect against SARS-CoV-2."

Saxe noted that physicians in Greece treated pulmonary disease with agarikon about 2300 years ago. The traditional medicine practice has been documented in many other regions, as well. More recently, agarikon has been found to inhibit a number of viruses in preclinical studies, including influenza A(H1N1), influenza A(H5N1), cowpox virus, and herpes viruses. Compounds in agarikon have also been shown to have antituberculosis properties.

As for turkey tail, the mushroom was studied extensively as a chemotherapy adjuvant for a variety of cancers more than a decade ago, Hopp said. In 1 example, women with breast cancer who received the mushroom in a phase 1 trial appeared to have improved immunity following chemotherapy. A 2012 meta-analysis of 13 clinical trials, conducted by researchers in Hong Kong, found a 9% absolute reduction in 5-year mortality among patients with cancer who were treated with turkey tail in addition to chemotherapy.

"The mushrooms were being used to boost immune function that was suppressed by either the cancer or the chemotherapy," Hopp said. "The trials showed modest improvement in immune function, but nothing large and definitive that would affect clinical practice."

Consequently, cancer research involving mushrooms slowed considerably in the US, but their therapeutic use is still standard practice in Japan and China, according to Hopp.

Mushrooms have evolved a variety of antimicrobial properties against bacteria and viruses that colonize them, some of which also infect humans. The MACH-19 investigators said they believe the combination of turkey tail and agarikon has the potential to impede COVID-19 by inhibiting viral replication, and they expect to test its antiviral effects in a phase 2 trial.

Testing Herbal Formulations

Their other treatment trial is testing an approach called modified Qing Fei Pai Du Tang (mQFPD)—a combination of 21 herbs from 4 Chinese herbal formulations that were developed to treat COVID-19 in Wuhan, China. "The experience with these herbs is very deep; the ones we are using are based on formulas that date to the third century," said Shubov, the trials' lead investigator.

In a large observational study in China, patients hospitalized with COVID-19 in early 2020 who used the herbs had a lower risk of death than those who didn't use them. Although individuals in both groups received antiviral medications, corticosteroids, and an immunomodulator, a higher percentage of the patients who used herbs also took antivirals, which could have skewed the results. However, after adjusting for patient characteristics and concurrent treatments, the risk of in-hospital mortality was 50% lower among those who received mQFPD for at least 3 days.

Shubov explained that in Chinese medicine, COVID-19 is understood to be an acute infection that causes a condition known as "cold dampness" to settle in the lungs. This triggers the production of mucus and phlegm which, if not expectorated, leads to "lung heat," or inflammation. "These terms sound unscientific, but they describe the complex networks of physiology that match the clinical syndrome of coryza that can develop to ground glass opacities and an unchecked inflammatory response [in COVID-19]," he said.

In an email to *JAMA*, Chinese herbal medicine expert John Chen, PharmD, PhD, OMD, an unpaid consultant on the MACH-19 trials, described several possible mechanisms of action for the herbs. According to Chen, researchers recently found that herbs used to clear "lung heat," such as *Huang Qin* (*Radix scutellariae*), inhibit SARS-CoV-2 replication and block the virus from binding to angiotensin-converting enzyme 2 receptors on cells. *Ma Huang* (Herba ephedrae), an herb used to treat asthma, contains ephedrine alkaloids with potent α-adrenergic and β-adrenergic activity in the lungs. *Gan Cao* (*Radix et Rhizoma glycyrrhizae*) has anti-inflammatory effects. And *Ban Xia* (*Pinelliae Rhizoma*) is known to thin mucus and promote its elimination, Chen noted.

A recent study in the *Chinese Journal of Natural Medicines* described 195 absorbed components and metabolites associated with mQFPD administration in mice. The data should provide "guidance for further investigation on the pharmacologically active substances and clinical applications" for the treatment, the study's authors wrote.

The Trials Commence

For each of the MACH-19 treatment trials, the investigators plan to recruit 66 patients who have tested positive for SARS-CoV-2 and are quarantined at home with mild to moderate symptoms. The participants will be randomized to receive either the mushroom combination, the Chinese herb formulation, or a placebo for 2 weeks.

Thomas N. Leung, DACM/Kamwo Herbs

Patients who are being treated with monoclonal antibodies or the experimental oral antiviral medication molnupiravir won't be excluded. "As long as those therapies don't adversely interact with the mushrooms or Chinese herbs, there is no reason for participants not to take a known successful treatment for COVID-19" in addition to traditional medicine, Shubov said.

Aside from safety, the investigators will examine efficacy markers such as COVID-19 symptom severity and duration and hospitalization and ICU admission rates.

"The trials are not powered to evaluate those metrics, but we hope to have trends to evaluate," Shubov said. Down the line, the planned efficacy phase will have 3 groups, each with 240 participants who will receive the mushrooms, Chinese herbs, or placebo.

Enrolling participants for the treatment trials has been challenging, however. "The waning of the pandemic is making recruitment harder," Shubov said. And logistically, only patients from the San Diego and Los Angeles areas are eligible to participate. "We have phlebotomists in personal protective equipment going to quarantining patients' homes to draw blood," Saxe said. "We have the resources to do that in Southern California, not in other parts of the country."

Conversely, recruiting participants for the trial evaluating mushrooms as a COVID-19 vaccine adjuvant has been relatively easy. "People perceive mushrooms to be completely safe and hope for a better response to their vaccine," Saxe said.

In this study, 66 participants in the general population will receive the mushroom mix or placebo for 4 days beginning on the day of their first vaccine dose. Individuals with previous SARS-CoV-2 infections can participate. "We are measuring participants' antibody levels at baseline and controlling for that," Saxe said. Besides safety, the trial will evaluate whether the mushroom combination increases antibody titers, reduces vaccine adverse effects, extends the vaccine's therapeutic duration, or affects other markers of immune function.

Slomski A. Trials Test Mushrooms and Herbs as Anti–COVID-19 Agents. *JAMA*. 2021;326(20):1997–1999. doi:10.1001/jama.2021.19388

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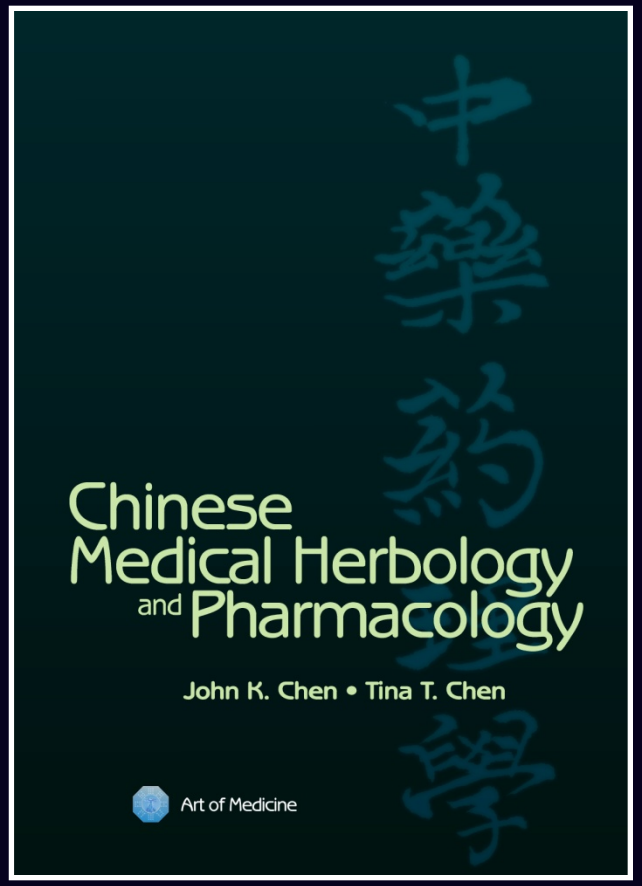
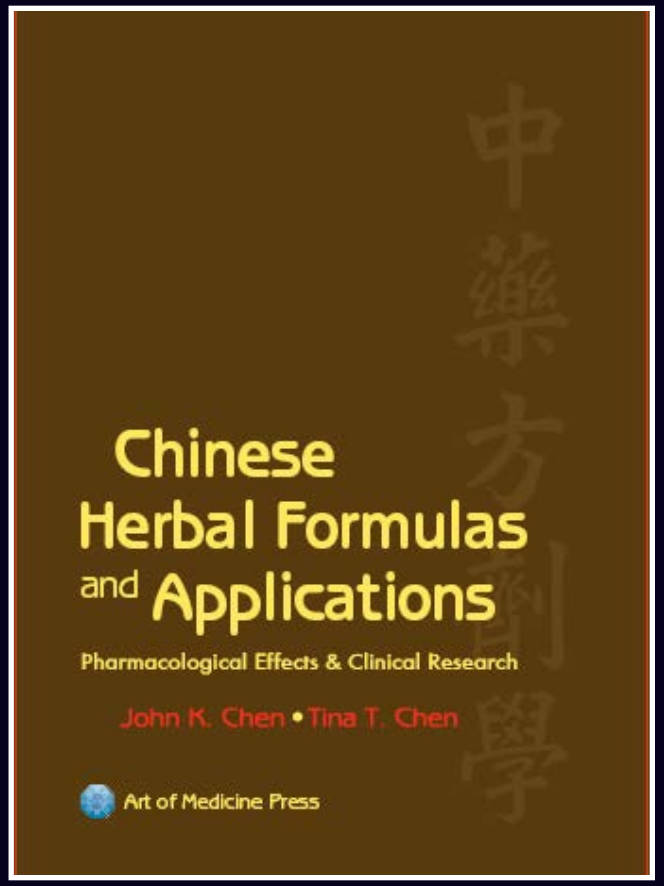
Single/Individual Herbs



Herbal Formulas



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