Comorbidity and its impact on 1590 patients with COVID-19 in China: a nationwide analysis

Wei-jie Guan1,26, Wen-hua Liang2,26, Yi Zhao2,26, Heng-rui Liang2,26, Zi-sheng Chen2,3,26, Yi-min Li4, Xiao-qing Liu4, Ru-chong Chen1, Chun-li Tang1, Tao Wang1, Chun-quan Ou2, Li Li5, Ping-yen Chen5, Ling Sang4, Wei Wang2, Jian-fu Li5, Cai-chen Li5, Li-min Ou5, Bo Cheng5, Shan Xiong2, Zheng-yi Ni6, Jie Xiang6, Yu Hu7, Lei Liu8,9, Hong Shan10, Chun-liang Lei11, Yi-xiang Peng12, Li Wei13, Yong Liu14, Ya-hua Hu15, Peng Peng16, Jian-ming Wang17, Ji-yang Liu18, Zhong Chen19, Gang Li20, Zhi-jian Zheng21, Shao-qin Gu22, Jie Luo23, Chang-jiang Ye24, Shao-yong Zhu25, Lin-ling Cheng1, Peng Peng16, Jian-ming Wang17, Shi-yue Li1, Jin-ping Zheng1, Nuo-fu Zhang1, Nan-shan Zhong1 and Jian-xing He2, on behalf of the China Medical Treatment Expert Group for COVID-19

Affiliations: 1State Key Laboratory of Respiratory Disease and National Clinical Research Center for Respiratory Disease, the First Affiliated Hospital of Guangzhou Medical University, Guangzhou Medical University, Guangzhou, China. 2Dept of Thoracic Oncology and Surgery, China State Key Laboratory of Respiratory Disease and National Clinical Research Center for Respiratory Disease, the First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China. 3The sixth Affiliated Hospital of Guangzhou Medical University, Guangdong, China. 4Dept of Pulmonary and Critical Care Medicine, China State Key Laboratory of Respiratory Disease and National Clinical Research Center for Respiratory Disease, the First Affiliated Hospital of Guangzhou Medical University, Guangzhou, China. 5State Key Laboratory of Organ Failure Research, Dept of Biostatistics, Guangdong Provincial Key Laboratory of Tropical Disease Research, School of Public Health, Southern Medical University, Guangzhou, China. 6Wuhan Jin-yintan Hospital, Wuhan, China. 7Union Hospital, Tongji Medical College, Huazhong University of Science and Technology, Wuhan, China. 8Shenzhen Third People’s Hospital, Shenzhen, China. 9The Second Affiliated Hospital of Southern University of Science and Technology, National Clinical Research Center for Infectious Diseases, Shenzhen, China. 10The Fifth Affiliated Hospital of Sun Yat-sen University, Zhuhai, China. 11Guangzhou Eighth People’s Hospital, Guangzhou Medical University, Guangzhou, China. 12The Central Hospital of Wuhan, Wuhan, China. 13Wuhan No. 1 Hospital, Wuhan Hospital of Traditional Chinese and Western Medicine, Wuhan, China. 14Chengdu Public Health Clinical Medical Center, Chengdu, China. 15Huangshi Central Hospital of Edong Healthcare Group, Affiliated Hospital of Hubei Polytechnic University, Huangshi, China. 16Wuhan Pulmonary Hospital, Wuhan, China. 17Tianyou Hospital Affiliated to Wuhan University of Science and Technology, Wuhan, China. 18The First Hospital of Changsha, Changsha, China. 19The Third People’s Hospital of Hainan Province, Sanya, China. 20Huanggang Central Hospital, Huanggang, China. 21Wenling First People’s Hospital, Wenling, China. 22The Third People’s Hospital of Yichang, Yichang, China. 23Affiliated Taihe Hospital of Hubei University of Medicine, Shiyan, China. 24Xiantao First People’s Hospital, Xiantao, China. 25The People’s Hospital of Huangpi District, Wuhan, China. 26These authors are joint first authors.

Correspondence: Jian-xing He, Dept of Thoracic Surgery, the First Affiliated Hospital of Guangzhou Medical University; China State Key Laboratory of Respiratory Disease and National Clinical Research Center for Respiratory Disease, Guangzhou, China. E-mail: drjianxing.he@gmail.com; Nan-Shan Zhong, State Key Laboratory of Respiratory Disease, National Clinical Research Center for Respiratory Disease, Guangzhou Institute of Respiratory Health, The First Affiliated Hospital of Guangzhou Medical University, 151 Yanjiang Road, Guangzhou, China. E-mail: nanshan@vip.163.com

The presence and number of comorbidities predict clinical outcomes of COVID-19


Copyright ©ERS 2020. This version is distributed under the terms of the Creative Commons Attribution Non-Commercial Licence 4.0.
ABSTRACT

Background: The coronavirus disease 2019 (COVID-19) outbreak is evolving rapidly worldwide.

Objective: To evaluate the risk of serious adverse outcomes in patients with COVID-19 by stratifying the comorbidity status.

Methods: We analysed data from 1590 laboratory confirmed hospitalised patients from 575 hospitals in 31 provinces/autonomous regions/provincial municipalities across mainland China between 11 December 2019 and 31 January 2020. We analysed the composite end-points, which consisted of admission to an intensive care unit, invasive ventilation or death. The risk of reaching the composite end-points was compared according to the presence and number of comorbidities.

Results: The mean age was 48.9 years and 686 (42.7%) patients were female. Severe cases accounted for 16.0% of the study population. 131 (8.2%) patients reached the composite end-points. 399 (25.1%) reported having at least one comorbidity. The most prevalent comorbidity was hypertension (16.9%), followed by diabetes (8.2%). 130 (8.2%) patients reported having two or more comorbidities. After adjusting for age and smoking status, COPD (HR (95% CI) 2.681 (1.424–5.048)), diabetes (1.59 (1.03–2.45)), hypertension (1.58 (1.07–2.32)) and malignancy (3.50 (1.60–7.64)) were risk factors of reaching the composite end-points. The hazard ratio (95% CI) was 1.79 (1.16–2.77) among patients with at least one comorbidity and 2.59 (1.61–4.17) among patients with two or more comorbidities.

Conclusion: Among laboratory confirmed cases of COVID-19, patients with any comorbidity yielded poorer clinical outcomes than those without. A greater number of comorbidities also correlated with poorer clinical outcomes.