Favorable outcomes of elderly COVID-19 patients in Guangzhou, China: a retrospective, observational study

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Abstract

Objective: To clarify the outcomes of elderly patients with COVID-19.

Methods: All 265 confirmed adult patients with COVID-19 were included in this retrospective study, 43 (16.2%) of whom were 65 years and older. Electronic medical records of the subjects were reviewed to obtain information on clinical characteristics and outcomes. The allocations of medical resource were also recorded.

Results: Only one death case occurred in the elderly. The mortality of elderly patients was no higher than that of young patients (2.3% vs. 0%, $P = 0.126$). The cure rate was 95.3% in elderly patients and 99.5% in young patients ($P = 0.067$), and the duration of hospitalization is 27 days in elderly patients and 18 days in young patients ($P = 0.001$). The elderly suffered from more comorbidities (67.4% vs. 24.8%, $P < 0.001$), most of which is hypertension. Significantly more severe cases occurred in elderly patients compared with young patients (37.2% vs. 16.7%, $P = 0.004$). The elderly were more likely to present with complications including acute respiratory distress syndrome, acute myocardial injury, septic shock and acute kidney injury (all $P < 0.05$), respectively. No medical staffs were infected during the treatment of COVID-19.

Conclusion: The cure rate and the mortality of the elderly seemed to be no worse than that of the young, though the elderly were with longer hospitalization. Elderly patients with COVID-19 could be treatable if handled properly. More severe cases and complications in elderly patients should prompt for more complex treatment and special considerations.

Introduction

COVID-19 is a respiratory infectious disease caused by a novel betacoronavirus, with typical symptoms such as fever, cough, sore throat, among others [1, 2]. In December 2019, a COVID-19 epidemic broke out in China and swept over the world within months later [3-5]. Given that general population is susceptible to the virus, affected victims has been increasing in number. As of May 2, there are more than 3,000,000 cases of COVID-19 infection in about 200 countries and regions, leading to a death toll of about 200,000, with devastating impacts on the public health, economy, and social security globally [5].

Owing to age related comorbidities, declined airway protection and slow immune responses, the elderly are more susceptible to COVID-19 and with higher morbidity and mortality [3, 6, 7]. Actually, the mortality in elderly patients varies from 0 to 34.5% in different region [8-11], and there have been less studies focusing on outcomes of elderly patients, among whom a general picture of the disease remains inadequately investigated.

In this retrospective study, we sought to describe the outcomes of COVID-19 infection in the elderly, and to share and analysis the strategies helpful to improve prognosis. We expected that understanding the outcomes of COVID-19 in these patients subset would be of great sense in guiding treatment, and preventing spread of the disease in a wider range.

Methods

This was a single-center, retrospective, observational study recruiting all consecutive adult patients with COVID-19 infection treated between January 20 to February 14, 2020, in Guangzhou Eighth People's Hospital, a government-designated hospital which admitted nearly 80% of the COVID-19 cases in Guangzhou, the capital city of Guangdong Province in southern China. The COVID-19 was diagnosed as per the World Health Organization interim guidelines [12]. Elderly patients referred to those aged 65 years or older. Accordingly, an age below 65 years was defined as 'young' patients in this study. The present study was approved by the Ethics Committee of Guangzhou Eighth People's Hospital (202001134). Because of the retrospective nature of the study design and the grim scenario of COVID-19 epidemic, the Ethics Committee assented to exempt of all informed consents after protection of patient identification and privacy was guaranteed by the study team.

Electronic medical records of the subjects were reviewed to obtain information on demography, symptoms, medical history, epidemiological history, laboratory findings, imaging studies, complications, treatments, and outcomes. The outcomes included mortality rate, cure rate and duration of hospitalization. The outcomes were fixed to March 20, 2020, the final date of follow-up. The allocations of medical resource were also recorded. The data collection was completed independently by a collaboration team of physicians from Guangzhou First People's Hospital.

A confirmed case with COVID-19 was defined as a positive result to real-time reverse transcriptase

polymerase chain reaction (RT-PCR) assay or highthroughput sequencing for nasal or pharyngeal swabs [12]. Severe COVID-19 was defined according to the criteria for community-acquired pneumonia (CAP) [13]. Acute liver injury was defined according to the European Association for the Study of the Liver's guideline [14]. Septic shock was defined in accordance with the Surviving Sepsis Campaign's guidance [15]. Acute respiratory distress syndrome (ARDS) was defined in accordance with the Berlin definition [16]. Acute kidney injury was identified according to the Kidney Disease: Improving Global Outcomes definition [17]. Acute Cardiac injury followed the definition used in previous study in patients with H7N9 [18]. The discharge standard was as followed: Be stable for more than 3 days; there was a negative result to RT-PCR assay in two consecutive times, 24 hours apart; the focus of chest CT were absorbed or cured. All patients who met discharge criteria were reviewed by 2 senior physicians.

Shapiro-Wilk normality test was used to assess for normal distribution of the data. Continuous variables with normal distribution are expressed as mean ± standard deviations (SD) while those with non-normal distribution as median and inter quartile range (IQR). Categorical variables are summarized as counts and percentages. For continuous variables, independent t-test or Wilcoxon rank sum test were used. For comparison of categorical variables, Chi-square test and Fisher's exact test were used. All data were processed with SPSS version 22.0 for Windows (SPSS, Chicago, IL, USA). Distribution map was plotted using Graphpad Prism 5.0 (GraphPad Software, LA, IL, USA).

Results

Baseline Characteristics

All confirmed adult patients were admitted to this study. There were 265 adult patients with COVID-19, with 43 (16.2%) aged 65 years and older. The baseline characteristics were shown in Table 1. Compared with young patients, elderly patients were more likely to have at least one comorbidity (67.4% vs. 24.8%, $P < 0.001$), most of which was hypertension (41.9% vs. 16.2%, $P < 0.001$). Severe cases were more common in elderly patients as compared with the young (37.2% vs. 16.7%, $P = 0.004$). The median incubation period was 5 days for either elderly patients or young patients. There were no differences in incubation period between elderly and young patients ($P = 0.913$). The median

time from diagnosis to hospitalization was -1 day for either elderly patients or young patients, and no differences were found between the two groups (P = 0.749). Fever was the most common symptom, found in a total of 182 patients comprising 31 elderly and 151 young patients (72.1% vs. 68.0%, P = 0.720). A total of 142 patients including 25 elderly and 117 young patients complained of coughs (58.1% vs. 52.7%, P = 0.617). Other symptoms included pharyngalgia, expectoration, and chills. Overall, there were no significant differences in symptoms between the elderly and young patients. Thirty-one patients (4 elderly and 27 young patients) were asymptomatic (9.3% vs. 12.2%, P = 0.796).

Imaging and Laboratory findings

The radiologic and laboratory findings were shown in Table 2. Compared with the young, the elderly patients showed lower serum albumin (35.9 vs. 39.8 g/L, P < 0.001), higher serum creatinine (58.3 vs. 28.2 μmol/L, P = 0.011) and urea nitrogen levels (4.8 vs. 3.6 mmol/L, P < 0.001). There were no significant differences between the two age groups in white blood cell counts, neutrophils, lymphocytes, aspartate transaminase (AST), alanine transaminase (ALT) and procalcitonin (PCT). A total of 243 patients were with abnormal Chest Computed Tomography (CT), including 42 elderly and 201 young patients (97.7% vs. 90.5%, P = 0.221).

Complications, treatment, and medical resource

In all subjects, the most common complication was ARDS, followed by acute liver injury, acute cardiac injury, septic shock, and acute kidney injury (Table 3). 39 (14.7%) patients were with ARDS, including 12 elderly and 27 young patients (27.9% vs. 12.2%, P = 0.008). Compared with the young, elderly patients were more likely to have acute myocardial injury (11.6% vs. 3.2%, P = 0.029), septic shock (9.3% vs. 0.9%, P = 0.007), and acute kidney injury (9.3% vs. 0.5%, P < 0.001). All patients were quarantined in hospital. The use of antibiotics [41 (95.3%) vs. 185 (83.3%), P = 0.057] and oxygen therapy [32 (74.4%) vs. 129 (58.1%), P = 0.060] did not differ significantly between the elderly and young patients. Nutritional support was more frequently needed in the elderly (46.5% vs. 17.1%, P < 0.001). Of 35 treated on non-invasive ventilation (NIV), 10 were elderly patients, with a higher proportion compared with the young (23.2% vs. 11.3%, P = 0.033). Elderly patients were more likely

to be admitted to intensive care unit (ICU, 20.9% VS. 5.4%, $P = 0.002$). There were more elderly than young patients necessitated continuous renal replacement therapy (CRRT, n = 4) and extra corporeal membrane oxygenation (ECMO, n = 3), compared with the young patients (all $P < 0.05$).

Outcomes

The clinical outcomes were shown in Table 4. One death case occurred in the elderly. The mortality of elderly patients was no higher than that of young patients (2.3% vs. 0%, $P = 0.126$). One patient in each group was transferred to another hospital. As of March 20, 41 elderly patients and 220 young patients had been discharged home (95.3% VS. 99.5%, $P = 0.067$), and the duration of hospitalization is 27.0 days in elderly patients and 18.0 days in young patients ($P = 0.001$).

Medical resource

A total of about 200 doctors and 600 nurses participated in the treatment of COVID-19 (Table 5). The average daily consumption of N95 mask is 2 per person, and about 1.5 protective suits were consumed per person per day. No medical staffs were infected during the treatment of COVID-19.

Discussion

This work shed light on the outcomes of elderly patients with COVID-19, with comparison to young individuals in southern China, and analyzed the role of medical resources in the disease prevention and control for the first time. Although the elderly spent more time in hospitalization, the cure rate and the mortality of the elderly seemed to be no worse than that of the young.

A possible reason for these favorable outcomes is early diagnosis, isolation and treatment for all patients [4], and these strategies need to be supported by sufficient medical resources. In this study, Centers for Disease Control recorded the activity track of all patients, screened and followed up the persons who contacted with them. For every suspected COVID-19 case, testing was performed without any hesitation. The median time from diagnosis to hospitalization is about -1 day, which means that each confirmed patient was isolated and treated in hospital immediately, and high suspected subjects were admitted to hospital before diagnosis. Of note, some patients were asymptomatic and merely with abnormal imaging signs. Such clinical silence could partially undermine the containment of COVID-19, due to missed diagnosis, misdiagnosis and treatment delay.

Consequently, it's not a good way to screen patients only through symptoms.

Previous studies show that the mortality in elderly patients varies from 0 to 34.5% in different regions, and is higher in severe epidemic areas [8-11]. In mild epidemic areas, the mortality of the elderly is lower and seems to be no worse than that of the young [9, 10]. These results are consistent with our study in Guangzhou, a mild epidemic area. Regional differences seem to be a risk factor that leads to the increase of mortality. A potential explanation may be the medical resources. Prevention is still the most important strategy [6], in which the medical resources play a key role. Sufficient medical resources ensure the health of medical staffs and avoid nosocomial infection, and then provide adequate medical services. In our study, no medical staffs were infected, which was helpful for the prevention and control of the epidemic.

Elderly patients were with more comorbidities, severe cases, and more complications, leading to more complex treatment and longer hospitalization. In this study, more elderly patients were admitted to ICU, and received high proportions of nutritional support treatment, mechanical ventilation, CRRT and ECMO. Currently, there is no standard treatment recommended for COVID-19 infections, and as an expedient approach, the treatment strategies follow the guidelines for management of CAP [13]. As such, handling the comorbidities and complications has become a critical part of care. Compared with young patients, elderly patients were more likely to have complications including ARDS, septic shock, acute renal failure, and acute myocardial injury. The overall frailty, multiple comorbidities, undernutrition and declining organ function might have collectively contributed to the higher rate of complications in these elderly patients. Given potentially higher prevalence of comorbidities, undernutrition, organ dysfunction and complications in this age group, elderly patients may be in more need of nutritional support, intensive care, dialysis, and ventilation than average adults. The comprehensive treatment may play a role in the favorable hospitalization outcomes of elderly patients with OVID-19. However, further study is needed to confirm an optimal treatment strategy for patients with COVID-19.

The most commonly used drugs are antibiotics, and the rational use of antibiotics may be helpful for the prognosis. For severe patients, clinical guidelines recommend experiential antibiotics [19, 20]. For

others, it remains controversial to decide when to start using antibiotics. Respiratory viruses play crucial roles in triggering bacterial attack, and older individuals are more susceptible to bacterial attack due to low immunity and high risk of aspiration [6, 21]. Therefore, early identification and management of bacterial infections is the key to improving prognosis. According to guidelines for treatment of community-acquired pneumonia guidelines, patients with influenza-positive CAP should be treated with antibiotics as soon as possible [13]; however, for pneumonia caused by COVID-19, how to identify bacterial infections and when to start antibiotics are yet to be clarified. Given the serious morbidity and mortality of COVID-19, patients with suspected bacterial infection should be prescribed antibiotics after weighing the advantages and disadvantages. Further search is needed to assess the effect of antibiotics in the treatment of COVID-19.

This study showed limitations in several aspects. First, due to retrospective nature of the study, certain clinical data such as body mass index (BMI), smoking history and infection history in the previous year were missing, and this would affect precise interpretation of the study results. Second, with a cross-sectional design, this study did not include a sample size sufficiently large to enable determining the risk factors of mortality in older patients. Third, as an observational study, it is unable to assess the effectiveness of these interventions in this study. Finally, this was a single-center study on COVID-19 patients from southern China. Therefore, our findings should be interpreted with caution and may not be suitable for generalization in a wider population.

Conclusions

The cure rate and the mortality of the elderly seemed to be no worse than that of the young, though the elderly were with longer hospitalization. Elderly patients with COVID-19 could be treatable if supported by sufficient medical resources. More severe cases and complications in elderly patients should prompt for more complex treatment and special considerations.

Declarations

Acknowledgements

Authors' contributions:

Study concept and design: Gang Xu, Jun Zhao, Fuchun Zhang, Feng Liu, Haiyan Shi, and Wei Ma;

Acquisition of data and patient recruitment: Yuwei Tong and Yueping Li;

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Approving the final submission: Haiyan Shi and Wei Ma. Gang Xu, Jun Zhao, Fuchun Zhang and Feng Liu contributed equally to the study.

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References

1. Huang C, Wang Y, Li X, et al. Clinical features of patients infected with 2019 novel coronavirus in Wuhan, China. Lancet 2020;395:497-506.
2. Lu R, Zhao X, Li J, et al. Genomic characterisation and epidemiology of 2019 novel coronavirus: implications for virus origins and receptor binding. Lancet 2020;395: 565-74.
3. Wang D, Hu B, Hu C, et al. Clinical characteristics of 138 hospitalized patients with 2019 novel coronavirus-infected pneumonia in Wuhan, China. JAMA 2020. https://DOI: 10.1001/jama.2020.1585
4. Guan WJ, Ni ZY, Hu Y, et al. Clinical Characteristics of Coronavirus Disease 2019 in China. N Engl J Med 2020. https://DOI: 10.1056/NEJMoa2002032
5. World Health Organization. https://www.who.int/docs/default-source/coronaviruse/situation-reports/20200501-covid-19-sitrep.pdf?sfvrsn=742f4a18_2. Access 2 May, 2020.
6. Nikolich-Zugich J, Knox KS, Rios CT, et al. SARS-CoV-2 and COVID-19 in older adults:

what we may expect regarding pathogenesis, immune responses, and outcomes. GeroScience 2020. https://DOI:10.1007/s11357-020-00186-0

7. Janssens JP, Krause KH. Pneumonia in the very old. Lancet Infect Dis 2004;4:112-24.
8. Chen T, Dai Z, Mo P, et al. Clinical characteristics and outcomes of older patients with coronavirus disease 2019 (COVID-19) in Wuhan, China (2019): a single-centered, retrospective study. J Gerontol A Biol Sci Med Sci 2020. https://DOI:10.1093/gerona/glaa089
9. Liu K, Chen Y, Lin R, et al. Clinical feature of COVID-19 in elderly patients: A comparison with young and middle-aged patients, Journal of Infection 2020. https://DOI:org/10.1016/j.jinf.2020.03.005
10. Wang KW, Gao J, Wang H, et al. Epidemiology of 2019 novel coronavirus in Jiangsu Province, China after wartime control measures: A population-level retrospective study. Travel Med Infect Dis 2020. https://DOI:10.1016/j.tmaid.2020.101654
11. Wang L, He W, Yu X, et al. Coronavirus Disease 2019 in elderly patients: characteristics and prognostic factors based on 4-week follow-up, Journal of Infection 2020. https://DOI:org/10.1016/j.jinf.2020.03.019
12. World Health Organization. Clinical management of severe acute respiratory infection when novel coronavirus (2019-nCoV) infection is suspected: interim guidance. (https://www.who.int/publications-detail/global-surveillance-for-human-infection-with-novel-coronavirus-(2019-ncov)). Access 5 May, 2020.
13. Metlay JP, Waterer GW, Long AC, et al. Diagnosis and treatment of adults withcommunity-acquired pneumonia: An official clinical practice guideline of the American Thoracic Society and Infectious Disease Society of America. Am J Respir Crit Care Med 2019;200:e45-67.
14. European Association for the Study of the Liver. EASL Clinical Practical Guidelines on

the management of acute (fulminant) liver failure. Journal of Hepatology 2017;66:1047-81.

15. Rhodes A, Evans LE, Alhazzani W, et al. Surviving Sepsis Campaign: international guidelines for management of sepsis and septic shock: 2016. Intensive Care Med 2017;43:304-77.

16. Ranieri VM, Rubenfeld GD, Thompson BT, et al. ARDS Definition Task Force. Acute respiratory distress syndrome: the Berlin definition. JAMA 2012;307:2526-33.

17. Kidney Disease: Improving Global Outcomes (KDIGO) Acute Kidney Injury Work Group. KDIGO Clinical Practice Guideline for Acute Kidney Injury. Kidney Int Suppl 2012;2:1.

18. Gao C, Wang Y, Gu X, et al. Association between cardiac injury and mortality in hospitalized patients infected with avian influenza A (H7N9) virus. Crit Care Med 2020. https://DOI:10.1097/CCM.0000000000004207

19. Alhazzani W, Møller MH, Arabi YM, et al. Surviving Sepsis Campaign: guidelines on the management of critically ill adults with Coronavirus Disease 2019 (COVID-19). Intensive Care Med 2020. https://DOI:10.1007/s00134-020-06022-5

20. Jamil S, Mark N, Carlos G, et al. Diagnosis and Management of COVID-19 Disease. Am J Respir Crit Care Med 2020. https://DOI:10.1164/rccm.2020C1

21. Clegg A, Young J, Iliffe S, et al. Frailty in elderly people. Lancet 2013;381:752-62.

Tables

Table 1: Baseline characteristics of patients with COVID-19

Baseline characteristics	Elderly (N=43)	Young (N=222)	*P*
Age, year	70.9±6.3	44.4±13.1	<0.001
Femal Sex, N(%)	19(44.2)	142(63.7)	0.017
Incubation period, day	5(9)	5(7)	0.913
Days from diagnosisto hospitalization, day	-1(2)	-1(3)	0.675
Severe cases, N(%)	17(37.2)	40(16.7)	0.004
Coexisting disorders			
Any, N(%)	29(67.4)	55(24.8)	<0.001
Hypertension, N(%)	18(41.9)	36(16.2)	<0.001
Cardiovascular disease, N(%)	7(16.3)	4(1.8)	<0.001
Diabetes, N(%)	7(16.3)	12(5.4)	<0.001
Malignancy, N(%)	3(7.0)	4(1.8)	0.087
Chronic respiratory disease, N(%)	2(4.7)	4(1.8)	0.252
Chronic kidney disease, N(%)	2(4.7)	2(0.9)	0.125
Chronic liver disease, N(%)	3(7.0)	8(3.6)	0.394
Cerebrovascular disease, N(%)	7(16.3)	2(0.9)	<0.001
Signs and symptoms			
Fever, N(%)	31(72.1)	151(68.0)	0.720
Cough, N(%)	25(58.1)	117(52.7)	0.617
Pharyngalgia, N(%)	9(20.9)	48(21.6)	0.999
Expectoration, N(%)	12(27.9)	38(17.1)	0.134
Chills, N(%)	8(18.6)	36(16.2)	0.480
Dizziness, N(%)	4(9.3)	31(14.0)	0.622
Fatigue, N(%)	7(16.3)	27(12.2)	0.458
Dyspnea, N(%)	5(11.6)	15(6.7)	0.338
Asymptomatic, N(%)	4(9.3)	27(12.2)	0.796

Table 2: Laboratory findings of patients with COVID-19

Laboratory findings	Elderly	Young	*P*
White blood cell counts, 10^9/L	5.1(3.5)	5.1(2.4)	0.473
Neutrophil counts, 10^9/L	3.5(3.0)	3.0(2.0)	0.066
Lymphocyte counts, 10^9/L	1.1(0.7)	1.4(0.9)	0.006
Ureanitrogen, mmol/L	4.8(2.4)	3.6(1.3)	<0.001
Creatinine, μmol/L	58.3(26.9)	28.2(32.9)	0.011
Procalcitonin, ng/mL	23.7(50.7)	0.4(40.0)	0.213
Albumin, g/L	35.9±4.4	39.8±5.0	<0.001
AST, U/L	20.9(13.0)	18.6(11.3)	0.347
ALT, U/L	20.4(31.6)	24.6(23.5)	0.418
Myo, ng/mL	48.5(49.8)	13.8(14.3)	0.007
Abnormal chest CT, N(%)	42(97.7)	201(90.5)	0.121

Abbreviations: AST, aspartate aminotransferase; ALT, alanine aminotransferase; Myo, myoglobin; CT,Computed Tomography.

Table 3: Complications and Treatments of patients with COVID-19

Complications and Treatments	Elderly (N=43)	Young (N=222)	*P*
Complications			
ARDS, N(%)	12(27.9)	27(12.2)	0.008
Acute liver injury, N(%)	5(11.6)	30(13.5)	0.999
Acute cardiac injury, N(%)	5(11.6)	7(3.2)	0.029
Septic shock, N(%)	4(9.3)	2(0.9)	0.007
Acute kidney injury, N(%)	6(14.0)	1(0.5)	<0.001
Treatments			
Antibiotics, N(%)	41(95.3)	185(83.3)	0.057
Oxygen Therapy, N(%)	32(74.4)	129(58.1)	0.060
Nutritional Support Therapy, N(%)	20(46.5)	38(17.1)	<0.001
Mechanical Ventilation, N(%)	10(23.2)	26(11.7)	0.043
NIV, N(%)	10(23.2)	25(11.3)	0.033
IMV, N(%)	4(9.3)	3(1.4)	0.015
ICU Admission, N(%)	9(20.9)	12(5.4)	0.002
Oseltamivir, N(%)	2(4.7)	14(6.3)	0.999
Systemic Corticosteroids, N(%)	2(4.7)	5(2.3)	0.314
CRRT, N(%)	4(9.3)	1(0.4)	0.003
ECMO, N(%)	3(7.0)	0(0)	0.004

Abbreviations: ARDS, acute respiratory distress syndrome; NIV, non invasive ventilation; IMV, invasive mechanical ventilation; ICU, intensive care unit; CRRT, continuous renal replacement therapy; ECMO,

extra corporeal membrane oxygenation.

Table 4: Clinical outcomes of patients with COVID-19

Clinical outcomes	Elderly(N=43)	Young(N=222)	*P*
Discharge from hospital, N(%)	41(95.3)	221(99.5)	0.067
Duration of hospitalization, day	27.0(16.0)	18.0(13.0)	0.001
Staying in hospital, N	0	0	N/A
Transferred to another hospital, N(%)	1(2.3)	1(0.5)	0.999
Death, N(%)	1(2.3)	0(0)	0.126

Table 5: Medical resource during the treatment of COVID-19 in Guangzhou Eighth People's Hospital

Medical resource	Total
Doctor, N	About 200
Nurse, N	About 600
N95 mask consumed per person per day, N	About 2
Protective suit consumed per person per day, N	About 1.5
Medical staff infection, N	0

Supplementary Files

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