

Review

The COVID-19 pandemic and the elderly patient: review of current literature and knowledgebase

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Abstract

Background: In the current pandemic, researchers have been busy and a lot has been published related to the disease, its prevention, management and recovery. However it appears there is scarcity of articles focused on the elderly, the population which is affected most severely by COVID-19. **Aims:** It was intended to perform a literature search and summarize the articles related to COVID-19 and the elderly published till the end of May 2020. **Methods:** PUBMED search was done with specific key words such as SARS-Cov-2, COVID-19, Elderly and Geriatric. **Results:** Less than 1% of all published articles on the pandemic are directly related to the elderly patients. Most of them are generic articles or deal with clinical features and case reports. Others deal with a range of topics including, effects on mental health, ethics and decision making, prevention, rehabilitation, pharmacy and research on the elderly with COVID-19. **Conclusions:** There is a need for more focused research and information on the impact of the pandemic on elderly patients. This may help refine criteria for treatment, triage and resource allocation for the elderly.

Key words

Coronavirus, Covid-19, Elderly, Geriatric, Older adults

Introduction

The COVID-19 pandemic has affected more than 180 countries and 5 million people around the world in the last six months. As the world reels under the rapidity of the spread and rates of infectivity, a lot has been published. There were 3201 publications published on this topic within 90 days of the disease being reported. Amidst changing features of the infection like the epidemiology, routes of infection, clinical presentation, and treatment protocols, one fact has stood out clearly and unwaveringly since the initial publications, that the disease affects the elderly patient with greater severity.

Although the journals with the high impact factors are publishing a lot of articles on the COVID-19 pandemic, there are only a limited number of high-quality pieces. This article aims to segregate the relevant publications

related to COVID-19 specific to the elderly and to provide a synopsis of the information published or known to date.

Methodology

A literature search on PUBMED with a strategy (SARS-Cov-2) OR (COVID-19 AND (2019:2020[pdat])) on 27th May 2020 revealed 16316 articles, 3998 in humans. This is a sharp rise from the 6831 and 1802 articles reported with the same strategy on 25th April.¹ As the search was made more specific for the elderly population with a strategy of (SARS-Cov-2) OR (COVID-19 AND (Elderly) OR (Geriatric) (2019:2020[pdat])) there were 360 articles, 328 in English. On searching all 328 articles, only 36 (0.2%) articles were dealing exclusively with COVID-19 in the elderly patient. These along with two ahead-of-print were added from cross-references were studied in depth.²⁻³⁹

Results

Relevant articles on elderly during COVID-19 were broadly grouped into five groups. These were, articles dealing with

- i. Review -(15 articles), and clinical manifestations or case reports in elderly -(5 articles)
- ii. Mental health issues of COVID-19 in the elderly -(5 articles),
- iii. Ethics, decision making, and resource allocation -(3 articles),
- iv. Outbreaks in elderly, prevention, palliation, and rehabilitation -(6 articles)
- v. Pharmacy, vaccines, and research in the elderly -(4 articles).

Review and clinical management related articles

There were four review articles, five commissioned editorials or specially commissioned articles, three correspondences, and one viewpoint articles under this group. In an elegant review article Shahid et al. discussed the transmission, symptomatology, mortality, and

treatment of COVID-19 with relation to the elderly.¹⁰ The high incidence of hypertension (63%), chronic kidney disease (38%), and diabetes (27%) in the American elderly predisposed many of them to take ACE inhibitors and angiotensin-receptor blockers (ARBs) that upregulate the ACE-2 receptor. Since the entry for the SARS-CoV-2 virus into the cell is via the angiotensin-converting enzyme-2 (ACE-2) receptor found in the lungs, endothelium, heart, kidneys, and gastrointestinal system, such patients may be at a higher risk for easy entry of the virus into the cells and manifest a more severe disease.

Clinical Features

Clinical features of COVID-19 in elderly are similar to those of most patients although respiratory distress may be more frequent than fever and cough. Elderly patients usually have greater number of coexisting comorbid conditions such as hypertension, diabetes mellitus, obesity and renal disease and are therefore at a higher risk of developing more organ failures such as respiratory failure, acute kidney injury, cardiac injury and liver dysfunction, among others, during the COVID-19. In a small number of patients of all age groups, elderly patients showed a different pattern of lung CT scan than younger ones, with lesser ground-glass opacities (GGOs) 48% vs. 87% and greater reticulonodular opacities (58%).⁴⁰

Mortality

It has been well documented that the difference in case fatality rates (CFRs) between the young and elderly COVID-19 patients is very high.^{41,42} In an analysis of more than 70,000 patients, an overall CFR of 2.3%, rose to 8% in patients aged 70 to 79 years and 14.5% in patients aged 80 years or more. In another report of 355 patients, the average age of the fatal cases was 79.5 years. Most fatal cases reported to date in generic COVID-19 literature have been in elderly patients with comorbid conditions. Among other reasons suggested for greater fatality in the elderly patients, is the effect of frailty (biological aging) and declining immunity on intensive care unit (ICU) related morbidity and mortality.^{2,20} Elderly patients in old age homes have been particularly vulnerable. The close proximity of the residents results in an increased risk of spread of infection in these homes; carers may inadvertently spread infections in areas without appropriate protection.⁴³

Treatment

Although many medications and vaccines are currently under investigation, the U.S. Food and Drug Administration (FDA) has not approved any treatment or vaccines for this virus, except remdesivir. FDA has issued an emergency use authorization for remdesivir for severe cases.

The mental health of the elderly during the pandemic

The concern for the mental health of elderly patients has been expressed in letters to editors. The general opinion

is that health policymakers and stakeholders may collaborate such that qualitative and timely mental health support may be made available to older adults.^{5,19,22}

Resilience has been identified as an important characteristic that might help one elderly cope better to the pandemic situation than the next.¹⁰ Banskota et al. have identified 15 mobile applications that could help older adults with their cognitive, visual, and hearing impairments. These may benefit the elderly during their periods of self-isolation and quarantine, especially as institutional facilities stop relatives' visits during the pandemic.

Ethics, decision making, and resource allocation

The other generic articles relate to issues of how the pandemic will affect the elderly patient due to the effects of social isolation, namely the effects on mental health and decreased physical activity on the overall health of the elderly with an increased risk of falls, vitamin D deficiency and poor access to physical exercises.⁴⁴

Some authors have called for greater empathy for the elderly in the pandemic times.³⁰ A consideration for age during resource allocation and decision making has been highlighted.^{45,23} The authors refer to the ethical guidelines released by the Società Italiana di Anestesia, Analgesia, Rianimazione e Terapia Intensiva (SIAARTI; Italian Society of Anesthesia, Analgesia, and Intensive Care) for the allocation of treatment in exceptional resource-limited situations. They suggest that it may not be the best idea to set an age limit for admission into the ICU in the event of pandemic related scarcity of resources. Instead, age may be taken into consideration, along with frailty and comorbid conditions.⁴⁶ Others suggest a three-pronged approach to resource allocation and decision making: determination of frailty status (and not just the patient's age), balancing of benefits and harms while considering the most likely outcome taking comorbidity into account, and shared decision-making focusing on the individual's goals of care.⁴⁵

Outbreaks, prevention, palliation, and rehabilitation

Three reports mentioned institutional outbreaks of COVID-19 in old-care homes.^{13,27,34} They emphasize the high risk of mortality in these situations and the dire need for early detection and isolation of infected residents. Tan et al. mentioned the steps taken in Singapore to decrease the spread of COVID-19 in their nursing homes,³³ and the associated risks of the same.

The Association for Geriatric Palliative Medicine (FGPG) has prepared treatment recommendations for the most common expected symptoms and the triage for intensive-care treatment under resource scarcity for the elderly COVID-19 patient.⁴⁷

In one of the few randomised controlled trials (RCTs) done exclusively on elderly COVID-19 patients, Liu et al. have studied the effects of 6-week respiratory rehabilitation training on respiratory function, quality of

life, mobility and psychological function in 72 patients of which 36 were control. The quality of life, pulmonary functions and anxiety levels in the experimental group which received rehabilitation was significantly better than those who did not.³⁶

Pharmacy, vaccines, and research

The evidence for hydroxychloroquine as a choice of drug treatment of COVID-19 has seen support, withdrawal of support and withdrawal of evidence for the withdrawal of support recently.⁴⁸ Chloroquine-related compounds that inhibit beta-galactosidase, a senescence marker has also been proposed to have a possible therapeutic benefit in the aging population.¹¹ Articles on pharmacy practice, clinical therapeutics, and possible new treatments for the virus targeting the elderly have been published.^{11,12} Sargiacomo et al. suggest senolytics and other antiageing drugs such as the azithromycin and doxycycline group of drugs, which may benefit the elderly patient with COVID-19 by inhibiting viral replication and IL-6 production.

Amidst the race to produce a vaccine for COVID-19, Har-Noy et al. have proposed a novel allo- immunization method for the elderly as an adjuvant, if not an alternative to vaccines. They propose allo-priming the elderly with intradermal injections of activated, intentionally mismatched, ex vivo differentiated, and expanded living Th1-like cells (AlloStim®). This method is currently in clinical use as an experimental cancer vaccine. The authors claim that this viral-specific Th1/CTL will provide sterilizing immunity and memory to prevent disease recurrence, and also increase the reserve pool for the next infection.¹⁸

Alongside, novel recommendations are also being published containing certain general recommendations for clinical researchers working with the elderly during the pandemic.²⁴ Electronic informed consent e-mailed surveys, or telehealth assessments have been suggested as tools that may help continue clinical research into elderly issues such as coping, psychological impact, delirium, and falls.

Significant areas of research during the pandemic have been identified.²⁵ The unique challenges faced by the elderly and their caregivers, strategies for improving family involvement in care while maintaining isolation, identifying appropriate clinical and epidemiological factors, frailty and acuity indices which affect prognosis, thereby helping create rational triage policies and effective ways of deploying palliative and end of life choices for the elderly, are a few of these.

Conclusion

This article presents a brief review of the currently published material about the elderly patients in the COVID-19 pandemic. The pandemic presents a fast changing scenario where evidence, knowledge and guidelines are changing rapidly. The quantum of articles and research related to the elderly patient during this

pandemic at the time of this review however is woefully low in relation to the others. It is hoped that this article may help researchers get an objective idea of what is being done or is needed in the critical area of 'the elderly in a pandemic.'

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References

1. Kambhampati SBS, Vaishya R, Vaish A. Unprecedented surge in publications related to COVID-19 in the first three months of pandemic: A bibliometric analytic report. *J Clin Orthop Trauma*. 2020;0(0). doi:10.1016/j.jcot.2020.04.030
2. Abdulmir AS, Hafidh RR. The possible immunological pathways for the variable immunopathogenesis of COVID—19 infections among healthy adults, elderly and children. *Electron J Gen Med*. 2020;17(4):1-4. doi:10.29333/ejgm/7850
3. Garnier-Crussard A, Forestier E, Gilbert T, Krolak-Salmon P. Novel Coronavirus (COVID-19) Epidemic: What Are the Risks for Older Patients? *J Am Geriatr Soc*. 2020;68(5):939-940. doi:10.1111/jgs.16407
4. Roland K MM. COVID-19 pandemic: palliative care for elderly and frail patients at home and in residential and nursing homes. *Swiss Med Wkly*. 150:w20235.
5. Armitage R, Nellums LB. COVID-19 and the consequences of isolating the elderly. *Lancet Public Heal*. 2020;5(5):e256. doi:10.1016/S2468-2667(20)30061-X
6. Koeberle S, Tannou T, Bouiller K, et al. COVID 19 outbreak: organisation of a geriatric assessment and coordination unit. A French example. *Age Ageing*. May 2020. doi:10.1093/ageing/afaa092
7. Chhetri JK, Chan P, Arai H, et al. Prevention of COVID-19 in Older Adults: A Brief Guidance from the International Association for Gerontology and Geriatrics (IAGG) Asia/Oceania Region. *J Nutr Heal Aging*. 2020;24(5):471-472. doi:10.1007/s12603-020-1359-7
8. Bouillon-Minois J-B, Lahaye C, Dutheil F. Coronavirus and quarantine: will we sacrifice our elderly to protect them? *Arch Gerontol Geriatr*. May 2020:104118. doi:10.1016/j.archger.2020.104118

9. Morley JE, Vellas B, Gates B. COVID-19 AND OLDER ADULTS. 2020;24(4):364-365. doi:10.1002/jmv.25735.3. COVID-19. *J Am Geriatr Soc.* 2020;68(5):947-949. doi:10.1111/jgs.16480
10. Shahid Z, Kalayanamitra R, McClafferty B, et al. COVID -19 and Older Adults: What We Know. *J Am Geriatr Soc.* 2020;926-929. doi:10.1111/jgs.16472
11. Sargiacomo C, Sotgia F, Lisanti MP. COVID-19 and chronological aging: senolytics and other anti-aging drugs for the treatment or prevention of corona virus infection? *Aging (Albany NY).* 2020;12(8):6511-6517. doi:10.18632/aging.103001
12. Alderman C. On the Pharmacy Radar: COVID-19 and Older People. *Sr care Pharm.* 2020;35(5):190-194. doi:10.4140/TCP.n.2020.190
13. McMichael TM, Clark S, Pogosjans S, et al. COVID-19 in a Long-Term Care Facility - King County, Washington, February 27-March 9, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(12):339-342. doi:10.15585/mmwr.mm6912e1
14. Zavoronkov A. Geroprotective and senoremediative strategies to reduce the comorbidity, infection rates, severity, and lethality in gerophilic and gerolavic infections. *Aging (Albany NY).* 2020;12(8):6492-6510. doi:10.18632/aging.102988
15. Nikolich-Zugich J, Knox KS, Rios CT, Natt B, Bhattacharya D, Fain MJ. SARS-CoV-2 and COVID-19 in older adults: what we may expect regarding pathogenesis, immune responses, and outcomes. *GeroScience.* 2020;42(2):505-514. doi:10.1007/s11357-020-00186-0
16. Mesa Vieira C, Franco OH, Gómez Restrepo C, Abel T. COVID-19: The forgotten priorities of the pandemic. *Maturitas.* 2020;136:38-41. doi:10.1016/j.maturitas.2020.04.004
17. Jawaid A. Protecting older adults during social distancing. *Science.* 2020;368(6487):145. doi:10.1126/science.abb7885
18. Har-Noy M, Or R. Allo-priming as a universal anti-viral vaccine: protecting elderly from current COVID-19 and any future unknown viral outbreak. *J Transl Med.* 2020;18(1):196. doi:10.1186/s12967-020-02363-3
19. Yang Y, Li W, Zhang Q, Zhang L, Cheung T, Xiang Y-T. Mental health services for older adults in China during the COVID-19 outbreak. *The lancet Psychiatry.* 2020;7(4):e19. doi:10.1016/S2215-0366(20)30079-1
20. Nickel CH, Rueegg M, Pargger H, Bingisser R. Age, comorbidity, frailty status: effects on disposition and resource allocation during the COVID-19 pandemic. *Swiss Med Wkly.* 2020;150(1718):w20269. doi:10.4414/smww.2020.20269
21. Lloyd-Sherlock P, Ebrahim S, Geffen L, McKee M. Bearing the brunt of covid-19: older people in low and middle income countries. *BMJ.* 2020;368:m1052. doi:10.1136/bmj.m1052
22. LaHue SC, James TC, Newman JC, Esmaili AM, Ormseth CH, Ely EW. Collaborative Delirium Prevention in the Age of COVID-19. *J Am Geriatr Soc.* 2020;68(5):912-917. doi:10.1111/jgs.16445
23. Cesari M, Proietti M. COVID-19 in Italy: Ageism and Decision Making in a Pandemic. *J Am Med Dir Assoc.* 2020;21:576-577. doi:10.1016/j.jamda.2020.03.025
24. Nicol GE, Piccirillo JF, Mulsant BH, Lenze EJ. Action at a Distance: Geriatric Research during a Pandemic. *J Am Geriatr Soc.* 2020;68(5). doi:10.1111/jgs.16443
25. Schutte DL. Research Goals During and Beyond the COVID-19 Pandemic: Reframing Older Adults as Essential and Priceless. *Res Gerontol Nurs.* 2020;13(3):118-119. doi:10.3928/19404921-20200505-01
26. Applegate WB, Ouslander JG. COVID-19 Presents High Risk to Older Persons. *J Am Geriatr Soc.* 2020;68(4):681. doi:10.1111/jgs.16426
27. Roxby AC, Greninger AL, Hatfield KM, et al. Detection of SARS-CoV-2 Among Residents and Staff Members of an Independent and Assisted Living Community for Older Adults - Seattle, Washington, 2020. *MMWR Morb Mortal Wkly Rep.* 2020;69(14):416-418. doi:10.15585/mmwr.mm6914e2
28. Borén HK, Kjølseth GH, Aaløkken TM, et al. A man in his nineties with fever and dry cough. *Tidsskr Nor Laegeforen.* 2020;140(6). doi:10.4045/tidsskr.20.0218
29. Liu K, Chen Y, Lin R, Han K. Clinical features of COVID-19 in elderly patients: A comparison with young and middle-aged patients. *J Infect.* 2020;80(6):e14-e18. doi:10.1016/j.jinf.2020.03.005
30. Doraiswamy S, Cheema S, Mamtani R. Older people and epidemics: a call for empathy. *Age Ageing.* 2020;49(3):493. doi:10.1093/ageing/afaa060
31. Zhang W. Imaging changes of severe COVID-19 pneumonia in advanced stage. *Intensive Care Med.* 2020;46(5):841-843. doi:10.1007/s00134-020-05990-y
32. Banskota S, Healy M, Goldberg EM. 15 Smartphone Apps for Older Adults to Use While in Isolation During the COVID-19 Pandemic. *West J Emerg Med.* 2020;21(3):514-525. doi:10.5811/westjem.2020.4.47372
33. Tan LF, Seetharaman S. Preventing the Spread of COVID-19 to Nursing Homes: Experience from a Singapore Geriatric Centre. *J Am Geriatr Soc.* 2020;68(5):942. doi:10.1111/jgs.16447
34. Etard J-F, Vanhems P, Atlani-Duault L, Ecochard R. Potential lethal outbreak of coronavirus disease (COVID-19) among the elderly in retirement homes and long-term facilities, France, March 2020. *Euro Surveill Bull Eur sur les Mal Transm = Eur Commun Dis Bull.* 2020;25(15). doi:10.2807/1560-7917.ES.2020.25.15.2000448
35. D'Adamo H, Yoshikawa T, Ouslander JG. Coronavirus Disease 2019 in Geriatrics and Long-Term Care: The ABCDs of COVID-19. *J Am Geriatr Soc.* 2020;68(5):912-917. doi:10.1111/jgs.16445

36. Liu K, Zhang W, Yang Y, Zhang J, Li Y, Chen Y. Respiratory rehabilitation in elderly patients with COVID-19: A randomized controlled study. *Complement Ther Clin Pract*. 2020;39:101166. doi:10.1016/j.ctcp.2020.101166
37. Neerland BE, Dobloug A, Nore KG, Mikaelson EE, Halsen A, Ahmed MV. COVID-19 in an elderly woman with acute functional decline. *Tidsskr Nor Laegeforen*. 2020;140(7). doi:10.4045/tidsskr.20.0307
38. Lloyd-Sherlock PG, Kalache A, McKee M, Derbyshire J, Geffen L, Casas FG-O. WHO must prioritise the needs of older people in its response to the covid-19 pandemic. *BMJ*. 2020;368:m1164. doi:10.1136/bmj.m1164
39. Wang L, He W, Yu X, et al. Coronavirus disease 2019 in elderly patients: Characteristics and prognostic factors based on 4-week follow-up. *J Infect*. 2020;80(6). doi:10.1016/j.jinf.2020.03.019
40. Arentz M, Yim E, Klaff L, et al. Characteristics and Outcomes of 21 Critically Ill Patients with COVID-19 in Washington State. *JAMA - J Am Med Assoc*. 2020;323(16):1612-1614. doi:10.1001/jama.2020.4326
41. Wu Z, McGoogan JM. Characteristics of and Important Lessons from the Coronavirus Disease 2019 (COVID-19) Outbreak in China: Summary of a Report of 72314 Cases from the Chinese Center for Disease Control and Prevention. *JAMA - J Am Med Assoc*. 2020;323(13):1239-1242. doi:10.1001/jama.2020.2648
42. WHO. [Internet]. Report of the WHO-China Joint Mission on Coronavirus Disease 2019 (COVID-19) [cited 2020 May 28] Available from [https://www.who.int/publications-detail/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-\(covid-19\)](https://www.who.int/publications-detail/report-of-the-who-china-joint-mission-on-coronavirus-disease-2019-(covid-19))
43. Holt A, Butcher B. Coronavirus deaths: How big is the epidemic in care homes? - BBC News. BBC news. <https://www.bbc.com/news/health-52284281>. Published 2020. Accessed June 15, 2020.
44. Pelicioni PHS, Lord SR. COVID-19 will severely impact older people's lives, and in many more ways than you think! *Brazilian J Phys Ther*. May 2020. doi:10.1016/j.bjpt.2020.04.005
45. Nickel CH, Rueegg M, Pargger H, Bingisser R. Age, comorbidity, frailty status: effects on disposition and resource allocation during the COVID-19 pandemic. *Swiss Med Wkly*. 2020; 150(April):w20269. doi:10.4414/smw.2020.20269
46. Vergano M, Bertolini G, Giannini A, et al. Clinical ethics recommendations for the allocation of intensive care treatments in exceptional, resource-limited circumstances: The Italian perspective during the COVID-19 epidemic. *Crit Care*. 2020;24(1):165. doi:10.1186/s13054-020-02891-w
47. Roland K, Markus M. COVID-19 pandemic: Palliative care for elderly and frail patients at home and in residential and nursing homes. *Swiss Med Wkly*. 2020;150(13-14). doi:10.4414/smw.2020.20235
48. Curnock E. Older people's views on the treatment and prevention of influenza in older people. *Age and Ageing*. doi:10.1093/ageing/31.4.322-a