



Short Communication

Anosmia – The common missing link between Alzheimer’s disease and COVID-19

Mohammad Azizur Rahman¹, Nabidur Rahman¹, Umme Habiba^{1,2}, Jobayer Rahman³, Salman Shakil^{1,4} and Kamrul Hsan⁵

¹Department of Biochemistry and Molecular Biology, Jahangirnagar University, Bangladesh

²Assistant Professor, Incepta Pharmaceuticals Limited, Khulna University, Bangladesh

³Enam Medical College and Hospital, Bangladesh

⁴Primeasia University, Bangladesh

⁵Department of Public Health and Informatics, Jahangirnagar University, Bangladesh

Received: 09 August, 2021

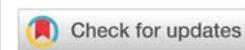
Accepted: 26 August, 2021

Published: 27 August, 2021

*Corresponding author: Mohammad Azizur Rahman, Department of Biochemistry and Molecular Biology, Jahangirnagar University, Bangladesh, E-mail: azizbmb@juniv.edu

Keywords: Alzheimer’s disease; Anosmia; COVID-19; Neurodegenerative disease; SARS CoV-2

<https://www.peertechzpublications.com>



Abstract

Concurrent evidence of some neurological manifestations in Alzheimer’s Disease (AD) and corona virus diseases 2019 (COVID-19) has beacons towards common links between these two global crises. Among numerous complications, the COVID-19 sufferers suffer from loss of smell or anosmia. Similar experience has been noticed in the AD patients. Thus, AD and COVID-19 might have some common links with respect to patho-physiology and this co-mediation might pave a new vista in withstanding these two calamities in a concerted fashion. Thus, the present article delves out the missing link between AD and COVID-19 followed by direction towards their plausible common controlling strategies.

Introduction

Alzheimer’s Disease (AD), the most fatal neurodegenerative disease affecting memory and learning abilities associated with cognitive impairment and behavioral alteration, is an age-onset disease of the elderly over sixties [1]. AD had been known on or after 1901 [1]. Corona Virus Disease 2019 (COVID-19), caused by the Severe Acute Respiratory Syndrome Corona Virus Type 2 (SARS CoV-2), has attracted the global focus since December 2019 [1-3]. However, both of them share some common pathophysiology among which anosmia or loss of smell and odor is a prominent link that would also be their putative therapeutic loop [1-3]. The following paragraphs discuss the underlying causes and consequences along with plausible withstanding strategies.

Alzheimer’s disease and anosmia

Though the symptoms of AD become obvious at the old ages (mostly after sixties), pathophysiological alteration ensue in early young life (third to fourth decade of life) [4]. Thus, if AD management could be strategized at young stage, its progression could be slowed down. In this context, early sign of anosmia is an important etiological factor in AD management [3,4]. Apart from the other noted reasons of AD such as deposition of Amyloid Beta (A β) plaques and Neurofibrillary Tangles (NFT), hyperactivity of acetyl choline esterase, genetic predisposition and involvement of proteomics, a novel approach in diagnosing AD pathogenesis seems to be the “anosmia” [2,4]. This notion is substantiated by the fact that people carrying e4 allele of apo-lipoprotein E4 (Apo E4) are

at increased risk of developing AD as well as anosmia [5]. As aging progresses, A β and NFT accumulate in neurons of the hippocampus and entorhinal cortex that disrupt olfaction as well as memory and learning processes ultimately leading towards AD complications especially dementia [2-5]. Older people (aged 57-85 years) having hyposmia (reduced ability of smelling) bears two times increased risk of developing dementia within five years than their age matched controls [6,7]. In line with this, those having anosmia, are most prone to develop dementia [6,7]. Thus, anosmia is positively correlated with dementia and AD development.

COVID-19 and anosmia

Anosmia is among the most common symptoms of COVID-19 around the globe [2,8]. SARS-CoV-2 uses the ACE2 receptor for entry into host cells and the olfactory tissues harbor ample ACE2 receptors [2,8]. Olfactory tissues might be much sensitive towards SARS-CoV-2 that leads to infection of the olfactory sensory neurons (OSN) ultimately impairing smelling processes [2,8]. Concomitant neuronal death might augment the olfaction process [2,8]. Thus, anosmia remains as the most prevalent and easy-to-detect COVID-19 complication.

Anosmia – the missing link and/or common link between AD and COVID-19

As loss of smell is the early determining symptom of AD and an early marker of COVID-19, anosmia stands as the bridging point between AD and COVID-19. Thus, anosmia might be the missing link between these two pathophysiologies. Anosmia is reflected through neurological complications that also commonly link AD and COVID-19, both of which entail neuro-psychiatric impairments. Thus, treatment strategies aimed at ameliorating anosmia might have seminal impact on withstanding the progression of both AD and COVID-19. As a whole, anosmia, the missing link, might turn into the common link for treating the global crises.

Conclusion

Anosmia had been reported to be linked with the pathophysiology of both AD and COVID-19. Early detection of anosmia and appropriate measures to mitigate this might aid in lowering AD and COVID-19 vulnerabilities. Anosmia-targeted therapeutic strategies and policy making would help us attaining a world free of COVID-19 and less loaded with AD patients.

References

1. Rahman MA, Abdullah N, Aminudin N (2015) Interpretation of Mushroom as a common therapeutic agent for Alzheimer's disease and cardiovascular diseases. *Crit Rev Biotechnol* 36: 1-12. [Link: https://bit.ly/3DhaAdQ](https://bit.ly/3DhaAdQ)
2. Rahman MA, Islam K, Rahman S, Alamin M (2020) Neurobiochemical Cross-talk Between COVID-19 and Alzheimer's Disease. *Mol Neurobiol* 19: 1-7. [Link: https://bit.ly/3kur4Xm](https://bit.ly/3kur4Xm)
3. Rahman MA, Habiba U (2021) COVID-19 and neuropsychiatric disorders: Common links and extended networks. *J Neurol Neurol Sci Disord* 7: 024-026. [Link: https://bit.ly/38cgOxr](https://bit.ly/38cgOxr)
4. Rahman MA, Rahman MS, Alam N (2020) Heightened Vulnerability of Alzheimer's disease in COVID-19 Cataclysm and Putative Management Strategies. *Annals of Alzheimer's disease and Care* 4: 027-029. [Link: https://bit.ly/3mxlRx](https://bit.ly/3mxlRx)
5. Manzo C, Serra-Mestres J, Isetta M, Castagna A (2021) Could COVID-19 anosmia and olfactory dysfunction trigger an increased risk of future dementia in patients with ApoE4? *Med Hypotheses* 147: 110479. [Link: https://bit.ly/3DI1wVh](https://bit.ly/3DI1wVh)
6. Kotecha AM, Corrêa ADC, Fisher KM, Rushworth JV (2018) Olfactory Dysfunction as a Global Biomarker for Sniffing out Alzheimer's Disease: A Meta-Analysis. *Biosensors (Basel)* 8: 41. [Link: https://bit.ly/38cUle2](https://bit.ly/38cUle2)
7. Adams DR, Kern DW, Wroblewski KE, McClintock MK, Dale W, et al. (2018) Olfactory Dysfunction Predicts Subsequent Dementia in Older U.S. Adults. *J Am Geriatr Soc* 66: 140-144. [Link: https://bit.ly/3ktZJo7](https://bit.ly/3ktZJo7)
8. Mathew D (2020) Loss of Smell in COVID-19 Patients: Lessons and Opportunities. *Front Hum Neurosci* 14: 598465. [Link: https://bit.ly/38hN8yK](https://bit.ly/38hN8yK)

Discover a bigger Impact and Visibility of your article publication with Peertechz Publications

Highlights

- ❖ Signatory publisher of ORCID
- ❖ Signatory Publisher of DORA (San Francisco Declaration on Research Assessment)
- ❖ Articles archived in worlds' renowned service providers such as Portico, CNKI, AGRIS, TDNet, Base (Bielefeld University Library), CrossRef, Scilit, J-Gate etc.
- ❖ Journals indexed in ICMJE, SHERPA/ROMEO, Google Scholar etc.
- ❖ OAI-PMH (Open Archives Initiative Protocol for Metadata Harvesting)
- ❖ Dedicated Editorial Board for every journal
- ❖ Accurate and rapid peer-review process
- ❖ Increased citations of published articles through promotions
- ❖ Reduced timeline for article publication

Submit your articles and experience a new surge in publication services (<https://www.peertechz.com/submission>).

Peertechz journals wishes everlasting success in your every endeavours.

Copyright: © 2021 Rahman MA, et al. This is an open-access article distributed under the terms of the Creative Commons Attribution License, which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

Citation: Rahman MA, Rahman N, Habiba U, Rahman J, Shakil S, et al. (2021) Anosmia – The common missing link between Alzheimer's disease and COVID-19. *Ann Alzheimers Dement Care* 5(1): 009-010. DOI: <https://dx.doi.org/10.17352/aadc.000018>