Short Communication

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

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Abstract

Concurrent evidence of some neurological manifestations in Alzheimer’s Disease (AD) and corona virus diseases 2019 (COVID-19) has beaconed 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 pathophysiology 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 (Aβ) 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 allelle of apo-lipoprotein E (apo E4) are
at increased risk of developing AD as well as anosmia [5]. As aging progresses, Aβ 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 pathophysologies. 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.

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