REVIEW ON SIDE-EFFECTS OF COVID-19 IN THE GROWTH OF NEUROLOGIC DISEASES

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ABSTRACT
Recent studies on risk factors and characteristics of the corona virus disease 2019 epidemic, have set up evidences that suggests persons afflicted by corona virus may suffer from neurological deficiency. Severely affected patients suffer from acute respiratory dysfunction, high levels of cytokines, immune response and neuroinflammation. These factors are the main causes for neurodegeneration that plays a vital role in Alzheimer Disease (AD). It is also said that the aged people are further vulnerable to AD after corona virus disease 2019 infection. This review gives the insight about risk factors of severely infected and elderly patients of COVID-19 developing cognitive decline, and gradually to AD, after recovering from SARS-CoV-2 infection. The main intention behind this review is to provide the base on future studies and investigations on corona virus and its effects on the neuro system. And also, to provide the awareness among the caretakers of corona virus infected persons with AD.

Keywords: Alzheimer’s, COVID-19, Cytokine, Inflammation, Neurodegeneration

INTRODUCTION
In late 2019, the origin of novel corona virus had been tracked down to a market in Wuhan, China [1]. The Corona virus was declared as a global pandemic by the World Health Organization on March 11, 2020 [2]. WHO report dated 6 April 2021, states globally 131,309,792 confirmed cases of corona virus disease 2019, with 2,854,276.

There are many observations that reported symptoms of Covid-19 that includes wide variety of neurological manifestations [4]. 36.4% incidence of neurological damage caused by corona virus has been reported in the retrospective study of 214 COVID-19 infected people. This shows the increasing evident of contribution of SARS-Cov-2 to a number of neurological issues which includes seizures, confusion, stroke, encephalopathy, anosmia, and total paralysis [5].

I. BACKGROUND
A recent study showed that 49 patients out of 58 admitted due to ARDS in ICU in Strasbourg in France, exhibited neurological symptoms during medical care, which includes confusion, agitation and signs of pyramidal tracts dysfunction such as enhanced tendon reflexes and clonus [27, 4]. 15 patients out of 45 had suffered from dysexecutive symptoms (for example heedlessness, confusion, or ineffectively composed movement in response to order), at discharge.
1.1. Symptoms of Covid-19 leading to Alzheimer’s disease

There is a continuing high risk of enduring psychopathic and Organic brain syndrome conditions like parkinsonism, depression, psychosis, Alzheimer’s and obsessive compulsive in the discharged patients from ICU and those who had recovered from respiratory symptoms [10]. [6] reports that meningitis, acute necrotizing encephalopathy, gustatory and olfactory are the severe neural difficulties of corona virus disease 2019. As per the University of Pennsylvania Smell Identification Test (UPSIT) reports, marked olfactory dysfunction has been observed in COVID-19 patients [7]. Around 85.6% of mild-to-moderate corona virus disease 2019 infected people have reported olfactory dysfunction [8]. Around 2% (1/60) of corona virus disease 2019 infected people have reported some degree of olfactory impairments [7]. In patients advancing from mild cognitive impairment (MCI) to AD have stated association with olfactory dysfunction, serving as a possible identifier for presymptomatic phases [9].

Covid-19 infections have been reported in people suffered with nerve disorders like optic neuropathy, encephalomyelitis disseminata, encephalitis, and parkinsonism [10]. A recent study and reports have reported that recovered corona virus disease 2019 infectors are at high risk of successively emerging neurological disease like Alzheimer’s disease [11].

Advancement of respiratory, heart, and neurological intricacies is unequivocally connected with helpless result in patients with covid-19. Notwithstanding intense respiratory trouble disorder and respiratory disappointment, intense cardiovascular injury and cardiovascular breakdown could be main considerations adding to the casualty danger of covid-19 paying little heed to history of past cardiovascular malady [12]. The cardiac threats are involved to blood flow in the brain which is termed as hypo perfusion, an indicator related with MCI and AD [13].

The epidemic and its results may likewise be accomplished as an injury, trailed by posttraumatic trauma issue. Thusly, stress and injury can quicken intellectual decrease. Age, ailment, sorrow, injury, and dementia are all hazard factors for self-destruction [14]. During the crisis of corona virus, persons with Alzheimer’s disease and related dementias (ADRD) may be even more marked. In ADRD stigma is one of the important pervasive problems. People with COVID-19 risk have been stigmatized [15].

[11] reports that Covid-19 recovered patients are at risk of developing long-term neurological consequences, due to any one or a combination of systemic inflammation, cerebrovascular changes, direct viral encephalitis and peripheral organ dysfunction mechanisms, which can aggravate a pre-existing nerve disorder or may initiate a new disorder.

Increased stress and behavioral problems [16] can lead to a new environment. Hypoxia may lead to Delirium which may complicate dementia [17]. The people who are living with dementia, medical care cost and dementia support need has been increased.

[31] reports that evocative connections exist between the neurologic and immunologic complications of COVID-19 and those that impact neurodegeneration and AD pathogenesis. The whole effects of the Covid-19 pandemic are not known yet, but it certainly may affect directly or indirectly to numerous AD patients.

1.2. Covid-19 effects on the health conditions of elderly

Noticeable inflammation of “cytokine strom” is the intense results in the Covid-19 recovered patients [18]. Higher reference line of inflammation presence in elderly patients may be the main reason for the higher risk after Covid-19. “Inflammaging” is a process in which inflammation gradually increases with age [19].

The rise of pro-inflammatory cytokines like interleukin-1(IL-1), tumor necrosis factor-alpha and IL-6 have been known to be increased in the elderly, due to “cytokine storm” is connected with SARS-CoV-2 infection [19]. This may make the elderly more susceptible to severe consequences from the infection.
As the casualty speed and the percentage of death in 65 or above old persons is more than other individuals, elderly individuals with psychological disorder are considered to be further weak to the catastrophic effects of infection outbreak [20] and also elderly individuals with medical comorbidities like chronic kidney disease, hypertension, cardiac arrest, cancroid, glaucoma, lung diseases are more than younger individuals [22]. Higher rate of pulmonary edema present in elderly is the major interpreter of mortal outcomes and also the specific risk factor for the inferior outcome [21].

For achieving isolation aloneness, social distancing, sorrow, nervousness and never-ending tension can lead to lengthy duration psychological effects [23]. Initial investigation has expressed improved incidence of complex posttraumatic stress (PTSD), depressive disorders, and adjustment reactions in the elderly [24].

Lastly, Covid-19 has not only shown its adverse effects on elderly but also on the health of students, youngsters, and health caretakers. As the long-time quarantine being the nightmare, therefore it results in tension, nervousness irritation, boredom, sadness, also attempting for suicide in youngsters [25]. It has been observed that online harassment has destroyed many life’s and many of the cases were related to worries, sadness and other health-related issues [26]. Attention deficit hyperactivity disorder (ADHD) behaviors of the children during the COVID-19 outbreak have been worsened when compared to normal days [28]. ADHD has harmful force on a broad choice of side involving feeling, self-pride, interpersonal relationships, and learning ability [29]. Health care takers who were exposed to COVID-19, have self-reported depression and anxiety [30].

II. CONCLUSION

Recent studies on risk factors and characteristics of the corona virus disease 2019 epidemic have found evidence that suggests Sars-CoV-2 affected persons virus may suffer from nerve disease and in particular AD. Neurologists, psychiatrists, and caretakers must be warned about probable rise in such cases in people who have survived from corona virus disease. Further, studies and investigations on SARS-CoV-2 virus are needed to find the relationship between the corona virus disease infections and its continuing nervous impairment on the Covid-19 survivors. Also, awareness needs to be provided to the parents and caretakers about the health issues like stress, anxiety, frustration, boredom, loneliness and depression in children, youngsters and elderly, which can eventually lead to suicidal attempts. Also, the awareness about the possible harmful impact of this pandemic and its consequences on the patients suffering from AD, can be provided to their caregivers.

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