biology and life sciences forum

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Abstract

Association of COVID-19 and Down Syndrome; a Systematic Review †

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† Presented at the 3rd International Electronic Conference on Brain Sciences (IECBS 2022), 1–15 October 2022; Available online: https://iecbs2022.sciforum.net/.

Abstract: Background: COVID-19 has become a global concern. Many risk factors have been identified. Down syndrome, which is 21 trisomy, affects the mental and physical health of the patient. The syndrome has many neurological complications, which include structural changes, mental retardation, young-onset Alzheimer's disease, strokes and basal ganglia damage. Much less data is available regarding the association of COVID with Down syndrome. Objective: The objective of this systemic review is to focus on the different evidence available related to the association of COVID-19 with Down syndrome. Method: PubMed/Medline, Science Direct, Web of Science, and Scopus databases were used to find the research undertaken related to the association of COVID with Down syndrome up to 2022. Results: this systemic review includes eight studies. All studies showed that Down syndrome is associated with severe COVID and can lead to hospitalization. Discussion: Down syndrome leads to severe immune dysregulation. Scientists are investigating the exact mechanism behind the dysregulation of the immune system caused by trisomy 21 or Down syndrome, but research on it is still ongoing. In DS, chromosome 21 activates multiple genes which cause hyperactivity of the immune system. Chromosome 21 encodes the following immune regulators: interferon (IFN) receptors, Interleukin (IL)-10, IL-22, and IL-26. Immune and non-immune cells are sensitive to Interferon(IFN) and many studies report that in the absence of any infection there is still hyperactivity in T cells due to Interferon(IFN) in DS patients. Interferon response, which is involved in the antiviral response, is vigorous in DS patients and leads to cytokine storm. Recent studies showed that COVID infections are driven by an exacerbated immune response to the virus, leading to cytokine storm, acute respiratory distress syndrome, thromboembolic processes, and multi-organ failure. Conclusion: Patients with COVID-19 and Down syndrome are more vulnerable and should be prioritized for vaccination.

Keywords: Down syndrome; COVID-19; vulnerable

Citation: Ali, D.A.; Ali, I.A.; Devi, U. Association of COVID-19 and Down Syndrome; a Systematic Review. *Biol. Life Sci. Forum* **2022**, *19*, 7. https://doi.org/10.3390/IECBS2022-12935

Academic Editor: Stephen Meriney

Published: 30 September 2022

Supplementary Materials: The following are available online at https://www.mdpi.com/article/10.3390/IECBS2022-12935/s1.

Author Contributions: Conceptualization, D.A.A. and I.A.A.; methodology, D.A.A.; software, D.A.A.; validation, D.A.A., I.A.A. and U.D.; formal analysis, D.A.A.; investigation, D.A.A.; resources, D.A.A.; data curation, D.A.A.; writing—original draft preparation, D.A.A.; writing—review and editing, D.A.A.; visualization, D.A.A.; supervision, D.A.A.; project administration D.A.A.; funding acquisition, D.A.A. All authors have read and agreed to the published version of the manuscript.

Funding: This research received no external funding.

Institutional Review Board Statement: Not applicable.

Informed Consent Statement: Not applicable.

Data Availability Statement: Not applicable.

Conflicts of Interest: The authors declare no conflict of interest.