

Association of COVID-19 and down syndrome; a systematic review [†]

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. Very less data is available regarding the association of COVID with down syndrome.

Objective: The objective of this systemic review is to focus on different evidence available related to the association of COVOD with down syndrome.

Method: PubMed/Medline, Science Direct, Web of Science, and Scopus databases were used to find the research done related to the association of COVID with down syndrome up to 2022. **Results:** this systemic review includes 8 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 still, the research on it is going on. In DS, chromosome 21 activates multiple genes which cause hyperactivity of the immune system. Chromosome 21 encodes the following immune regulators: interferon (IFN) receptors, (IL)-10, IL-22, and IL-26. Immune and non-immune cells are sensitive to IFN and many studies report that in the absence of any infection there is still hyperactivity of T cells due to TFN in DS patients. IFN response which is involved in the antiviral response is vigorous in DS patient and lead 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 and down syndrome are more vulnerable and should be prioritized for vaccination