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Der Pharmacia Lettre, 2022, 14 (6): 14-15
(http://scholarsresearchlibrary.com/archive.html)

ISSN 0975-5071
USA CODEN: DPLEB4

The Outcomes of COVID-19: Evaluated by Prior Viral Infections

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***Received**:30-May-2022, Manuscript No. DPL-22-69198; **Editor assigned**: 02-Jun-2022, Pre QC No. DPL-22-69198(PQ);**Reviewed** :17-Jun-2022, QCNo.DPL-22-69198; **Revised** : 23-Jun-2022, Manuscript No. DPL-22-69198(R); **Published** : 30-Jun-2022, DOI: 10.37532/dpl.2022.14.14*

DESCRIPTION

Since the start of the COVID-19 pandemic in early 2020, It has focused on understanding the pathogenesis of this disease. However, the description of the role of confections between SARS-CoV-2 and other viral agents, and their association with COVID-19 clinical symptoms, is still limited. Moreover, the potential impact of previous viral infections on the development of COVID-19 is unknown. Given the actual link between metabolic-related diseases and the severity of COVID-19, as well as the worsening of patients due to SARS-CoV-2-induced immunopathogenic events, the impact of other viral infections known to alter physiology at both the metabolic and immune levels should be considered to develop a better understanding of COVID-19 growth in certain populations.

Recent metabolomics analyses have shown that some Flaviviride family members, such as Hepatitis C Virus (HCV) and dengue virus cause profound metabolic changes that can survive after antiviral therapy. Intriguingly, both functional therapeutic and other hepatitis delta viruses, such as Hepatitis A Virus (HAV), have been related to changes in adaptive immune responses, which may impact the process of subsequent viral diseases.

During this pandemic, the effective use of vaccines and antibiotics combined with massive sterilization programs, resulted in a shift in the human disease spectrum, with infections decreasing and allergies increasing. In an order to prove this occurrence, the hygiene hypothesis evolved, indicating that it may be a result of an immune system. This hypothesis was confirmed by studies that show an inverse correlation between allergies and systemic infections caused by viral pathogens, such as HAV, which is mostly transferred the fecal-oral route, and this was coined in David Strachan's suggestion that symptoms may be prevented by viral infections transmitted through 'unhygeinic contact' during early 2020s, Since the vaccines were intended to provide acquired immunity against COVID-19 this knowldege accelerated the development of various vaccines platforms during early 2020 .

HAV infections were mainly seen during childhood that have been linked to a topic, allergic hypersensitivity and decresing in Immunoglobulin levels. These findings are consistent with the pattern observed in most developing countries where HAV infection is still prevalent and allergies are less common than in western countries where the incidence of HAV infections is lower but the incidence of allergic diseases has increased. Moreover, recent findings support the view that the simple presence of an anti-HAV immune response, as well as its intensity and quality is insufficient to protect against the symptom of allergic diseases. Indeed, an inflammatory cytokine-related profile during HAV infections contributes to disease severity and may be associated with the development of different clinical outcomes, such as more effective immunity to allergies.

It has been well established that when multiple infections occur within a short period of time the host immune system to one or both pathogens can influence the outcome of either disease. More particularly, when infections are separated in time the adaptive immune response to the first infection has been shown to have a significant impact on the clinical manifestations of the second. Moreover, some viral infections are highly immunosuppressive and may interrupt immune responses to secondary infection. Measles Virus (MV) is one of the most immunosuppressive pathogens known to date, and people who have clinical measles frequently experience immunopathogenic events during secondary infections. A recent eye-opening study found that while host immunity function is restored after MV infection recovery, humoral immune memory is lost, altering previously acquired memory. This "immunological amnesia" makes people vulnerable to subsequent infections and is undoubtedly a problem as new viral pathogens emerge.

Another situation that restarts the immune response by affecting the mechanisms responsible for protective immunity is when viruses interfere with effective host immunity in a process known as immune escape. Human immune processes can also affect the response to heterologous infections (secondary infection) by altering the adaptive immune response elicited by the first infectious agent. Secondary infections caused by heterologous DENV serotypes, for example, have been linked to the development of Dengue Shock Fever/Dengue Shock Symptoms (DHF/DSS) in some infected patients, as a result of a severe inflammation. These events, which are usually caused by secondary DENV infections with heterologous serotypes, have not been studied in secondary infections with viruses other than DENV. Although powerful metabolomic techniques have recently been used to consistently identify changes in the levels of amino acids, dicarbocylic acids, fatty acids, and other tricarboxylic acid cycle-related metabolites induced by DENV infection, the role of these metabolic signatures and how they might alter subsequent viral infections and thus disease outcome has yet to be investigated.

The impact of DENV, HAV, and HCV infections on the development of COVID-19 brought on by SARS-CoV2 is still unknown. Any of these viruses can impact liver function. Because DENV, HAV, and HCV are typically found in poor and marginalised groups, it is crucial to keep exploring the connection between these pathology in epidemic locations and DENV, HAV, and HCV.