

- **Aging, Immunity, and COVID-19: How: Age Influences the Host Immune Response to Coronavirus Infections?**

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The COVID-19 pandemic has revealed a striking demographic bias in the number of cases and deaths, with the elderly population being the most significantly afflicted. Besides the impact of genetics and underlying comorbidities, aging causes numerous physiologic changes within the immune system broadly categorized into immunosenescence and inflamm-aging.

Age-related changes influence the host immune response and therefore not only weaken the ability to fight respiratory infections but also to mount effective responses to vaccines.

Age-related quantitative and qualitative changes in the immune system affect cells and soluble mediators of both the innate and adaptive immune responses within lymphoid and non-lymphoid peripheral tissues. These changes determine not only the susceptibility to infections, but also disease progression and clinical outcomes thereafter. Furthermore, the response to therapeutics and the immune response to vaccines are influenced by age-related changes within the immune system.

Therefore, better understanding of the pathophysiology of aging and the immune response will not only help understand age-related diseases but is also necessary to tailor therapies and vaccine strategies in a step towards personalized medicine especially for deadly pandemic-causing diseases like COVID-19.

- **Humoral Response after SARS-Cov-2 mRNA Vaccine in a Cohort of Hemodialysis Patients and Kidney Transplant Recipients & the Lack of immune response to SARS-CoV-2 in a Solid Organ Transplant patient**

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It is well established that patients with chronic kidney disease and those taking immunosuppressants have lower antibody titers and lower rates of seroconversion following vaccination compared to healthy individuals.

Studies suggest that postvaccination humoral response is strongly inhibited by immunosuppressant therapy in kidney transplant recipients and is reduced by the uremic condition in hemodialysis patients.

Patients should be advised that vaccination may not confer the same degree of immunity reported in currently available studies and physicians should remain clinically suspicious for infection with SARS-CoV-2 in solid organ transplant patients regardless of vaccination status.

However, with Elisa assay testing, results were shown to be correlated with SARS-CoV2 neutralizing antibodies suggesting that low titer of anti-SARS-Cov2 may still be efficient in neutralizing the virus.

Although more data is urgently needed on the serologic and clinical efficacy of currently available vaccines in organ transplant and other severely immunocompromised patients due to either the complete lack of or the existence of very low amounts of antibodies, Neutralizing Antibody Titer testing should be administered regularly to ensure proper care and treatment.

- **Neutralizing Antibody Titer Testing alongside the Potential use of convalescent plasma for SARS-CoV-2 prophylaxis and treatment in immunocompromised and vulnerable populations.**

Taylor & Francis Group Expert Review of vaccines:

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COVID19 convalescent plasma (CCP) is a promising drug for treatment and post-exposure prophylaxis of COVID-19.

Key issue of CCP therapy pertains to the quality of CCP produced by transfusion services. Assuming that the anti-viral activity of the CCP is mostly linked to the amount of antibodies present, it follows that the more the neutralizing antibodies, the more effective the plasma will be in blocking viral replication.

Among patients with hematological malignancies, those suffering from lymphoproliferative B-cell disorders or receiving B-cell depleting therapies are the ones who are likely to also benefit most from CCP therapy. Such patients, indeed, are unable to mount an adequate immune response against SARS-CoV-2 and thus may benefit from the passive transfer of anti-SARS-CoV-2 antibodies through CCP transfusion administered during the early phase of viral infection. Therefore, determining the Neutralizing Antibodies Titer in such patients will provide the clinicians a guide on how to proceed with care and treatment.

