Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

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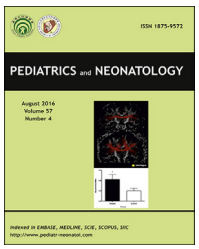

Letter to the Editor

Reply: Thymopoiesis, inflamm-aging, and COVID-19 phenotype

Dear Editors:

We agree that the age-related immune response, especially the thymus-dependent T-cell differentiation, may play a key role in the varied severity of COVID-19 in different age groups.[1,2] It is intriguing to learn that the thymopoiesis and thymic output are greatly reduced after reaching 40 years of age, which is consistent with the observation that the COVID-19 severity increased significantly in patients beyond this age.[3]

COVID-19 was less commonly seen in the pediatric population, with only mildly severe or asymptomatic infections in children, as compared to the adult population.[4] The pediatric cases younger than 20 years old accounted for only 2.1% of the total 44,672 laboratory-confirmed cases in China.[3] This extremely low incidence of pediatric cases was not seen in previous global pandemics of respiratory diseases. Moreover, according to the age-specific seroprevalence of 2009 pandemic influenza A H1N1 (pH1N1) in Taiwan, we found that the overall seropositivity rate was 20.6% among unimmunized population (suggesting natural infection), with the highest rates occurring in children aged 6—9 and 10—17 years (47.8% and 47.7%, respectively).[5] Another New Zealand study also indicated that children aged 5—19 years had the highest seropositivity rate of pH1N1 and that age was the most significant risk factor.[6] This observation suggested that children were at the greatest risk of infection during the global pandemic of the novel H1N1 influenza, which supported the idea that schoolchildren constituted the main population that accounted for pH1N1 transmission in the community and was the major driver in boosting the pandemic.

The condition was completely different for the COVID-19 pandemic and adults appeared to be more susceptible to SARS-CoV-2 than children. However, the pandemic is still evolving and the observation at this stage might be misleading.[4] A low possibility of contracting the virus because of fewer outdoor activities and lesser international travel has been suggested as the possible reason for the lower COVID-19 incidence among children as compared to adults.[7] Alternatively, the difference in distribution, maturation, and functioning of the ACE2 receptor for SARS-CoV-2 has also been postulated as the potential mechanism for the varied age-related incidences.[8] Nevertheless, these speculations lack solid evidence and further studies will be needed to elucidate the mechanisms. Moreover, given the high rate of mildly severe diseases and asymptomatic infections in children, the seroprevalence studies after an outbreak in a confined region will be critical for the comprehensive understanding of the age-related susceptibility to COVID-19. The susceptibility data along with the age-related immune response to SARS-CoV-2 will provide valuable information for combating this potentially lethal and emerging infection.

Conflict of interest

Chih-Jung Chen declared no conflict of interest.

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