EDITORIAL

Outbreak In China due to HMPV: Can "immune debt" explain it?

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In the aftermath of the Covid-19 pandemic, recent reports(1) of outbreaks of respiratory illnesses mostly due to the Human Metapneumovirus (HMPV), in many provinces of China are causing apprehensions of another pandemic.

While first discovered in the Netherlands in the year 2001, it is a common pathogen globally. Serological studies suggest that it has been circulating since 1958. (2) Like most respiratory viruses it is spread predominantly by droplets or by contact with an infected person or contaminated surfaces. No extra-human reservoir has been reported. However, a closely related virus, the Avian Metapnemovirus (AMPV), cause infections in birds suggesting that the HMPV might have evolved from the zoonotic AMPV.(3) While transmission is perennial, surges occur in winter and early spring. It is a single stranded RNA virus belonging to the Pneumoviridae family. While there are four viral genotypes namely, A1, A2, B1, and B2 none predominate and there no variation in severity between the strains.(2)

Most children get infected by the age of five years. However, re-infections occur throughout life.(2) It can affect both the upper and lower respiratory tract. The latter can cause pneumonia, bronchiolitis and can aggravate asthma. Treatment is supportive, with antipyretics, hydration, oxygen and intravenous fluids if needed. (4)

Almost 90 to 100% of children get infected by the HMPV by the age of five years according to seroprevalence studies.(2) Approximately, 5 to 10% of hospitalization of children below 6 months is due to HMPV, which is three times higher than children between 6 months to 5 years.(5)

In later years re-infection occurs due to a different genotype or insufficient immunity acquired from earlier infections. While these infections are usually mild and self limiting with common flu like symptoms, the elderly, the immunocompromised or those with chronic lung lung diseases may fare badly.(6, 7)

For a virus which has been in circulation for over half a century, and considering that almost all children encounter the infection by five years of age, the present outbreaks in various provinces of China overwhelming the hospital services is a bit puzzling. Viruses which are in circulation for long do not cause overwhelming outbreaks. This prompts one to look beyond the virus.

Since the introduction of non-pharmacological interventions (NPI) like physical distancing,

isolation and quarantine during the Covid-19 pandemic, a rather nebulous hypothesis, the "immune debt" is gaining ground.(8) It is postulated that these measures impacted the epidemiology of many childhood diseases.(9)

Strict restrictive measures during the past pandemic presumably reduced exposure of children since their early months, to various viruses and other pathogens resulting in a lack of immune stimulation against many community acquired microbes.(10) This phenomenon can hypothetically increase the proportion of "immunological naïve" children who become more vulnerable to various infections en masse resulting in overwhelming of hospital services.

Similar phenomena of surges in endemic respiratory infections have been observed in children as well as adults post pandemic in many Western countries as well in New Zealand and Australia. (11-17)

Is China experiencing the same phenomenon? Is China, a most populous country, with large proportion of children who have escaped the HMPV infection in early childhood due to restrictive NPI measures, repaying the "immunity debt" with interest?

We will get answers to these questions once research from China is available to the scientific community.

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