Kawasaki disease (KD) is an acute febrile vasculitis of childhood of unknown cause. As the coronavirus disease 2019 (COVID-19) pandemic continues, many countries have implemented nonpharmaceutical interventions (NPIs) to mitigate the spread of the virus. In Korea, NPIs such as mandatory mask wearing, school closure, and testing and isolation of symptomatic individuals were implemented in February 2020, with good compliance. On-site school reopening was postponed until May 20, 2020, and schools were reopened gradually until June 6, maintaining strict policies such as physical distancing and restrictions on private education and group activities. This nationwide intervention provided a unique opportunity for us to investigate the collateral effect of NPIs on the incidence of other diseases. We aimed to investigate whether NPIs were associated with a change in KD incidence in Korea, the country with the second-highest KD incidence rate worldwide.

In this retrospective, ecologic study, data on all KD cases among children 0 to 19 years of age from January 2010 to September 2020 were collected using the National Health Insurance Service database. The NPI period was defined as February through September 2020. The KD incidence rate in the NPI period was compared with the annual mean incidence rate during the same months in the pre-NPI period and with the incidence rate predicted by the autoregressive integrated moving average model.

KD was defined as a case where the International Classification of Diseases–10 diagnostic code for KD (M30.3) and the prescription code for intravenous immunoglobulin (IVIg) were claimed together. IVIg-resistant KD was defined as recrudescent or persistent fever 24 to 48 hours after the first IVIg infusion, requiring an IVIg prescription nonconsecutively for at least 3 days. These data are licensed for this analysis only, and the institutional review board approved the study.

A total of 53,424 cases of KD were identified; among these, 83% occurred in children <5 years of age, and 17% were resistant to IVIg. In the pre-NPI period, the annual mean incidence was 48.1 per 100,000 persons and the monthly mean incidence was 4.1/100,000 (Figure [A]). After NPI implementation, KD incidence declined sharply; from April onward, it plateaued (Figure [B]). KD incidence is typically seasonal, with a minor peak in the late spring and summer and a larger one in the winter; however, this seasonal pattern was absent in the NPI period. When considering the months from February to September, the incidence in the NPI period was 18.8/100,000, corresponding to 60% of the mean incidence (31.5/100,000) in the pre-NPI period ($P=0.085$) and 58% of the predicted incidence (32.2/100,000 [95% CI, 46.6–77.9%]). The incidence in children between 0 and 4 years of age, the group with the highest incidence rate, was 80.0/100,000, significantly lower than the...
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The mean incidence in the pre-NPI period (123.0/100,000; P=0.003) and the predicted incidence (123.3/100,000 [95% CI, 51.9–86.7%]; Figure [C]). In the 5 to 9 years of age group, the incidence (10.6/100,000) was also significantly lower than the mean incidence (23.8/100,000) in the pre-NPI period (P=0.04) and the predicted incidence (24.7/100,000 [95% CI, 30.9–70.6%]; Figure [D]). However, there was no difference in the incidence before and after NPI implementation in the 10 to 19 years of age group, the group with the lowest incidence (Figure [E]).

The incidence of IVIg-resistant KD had been increasing since 2018 in the pre-NPI period (Figure [A]), whereas the overall KD incidence did not change significantly (post/pre-NPI slope coefficient=0.04, P<0.0001). There was no significant change in the incidence of IVIg-resistant KD during the NPI period (6.8/100,000) compared with the annual mean of the previous 10 years (5.1/100,000; P=0.99).

The reasons for the association of NPI-related factors and KD incidence decrease are unclear. A reduction in respiratory viral infections and climate change, which have been cited as potential external triggers, were also associated with our findings. The incidence of KD-like diseases such as adenovirus infection and measles, which cause febrile rashes that can mimic KD, decreased after implementation of NPIs; this association may have created a bias. However, the proportion of IVIg-resistant KD, a severe form of KD, did not change in 2020 compared with that in 2019 (37.7% and 36.2%, respectively; P=0.28). This finding suggests that the decrease of KD-like diseases, generally milder than KD, had little effect on the overall decrease in the incidence of KD. Nevertheless, the KD incidence rate in Korea (80/100,000 children <5 years of age) is 3 to 16 times higher than that in Western countries (5 to 25/100,000 children <5 years of age), even after NPI implementation. This difference suggests that other variables, such as genetic and ethnic factors, are important in the pathogenesis of KD, regardless of the effect of NPIs.

This nationwide study reveals that the KD incidence decreased significantly after the implementation of NPIs.
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in Korea. Further long-term research is needed to determine whether the decrease in incidence of KD is solely attributable to the effects of NPIs.

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Disclosures
None.

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