

## CORRESPONDENCE



## Detection of Covid-19 in Children in Early January 2020 in Wuhan, China

**TO THE EDITOR:** A small number of cases of coronavirus disease 2019 (Covid-19) have been described in children,<sup>1,2</sup> and our understanding of the spectrum of illness is limited.<sup>3</sup> We conducted a retrospective analysis involving hospitalized children in Wuhan, China.

From January 7 to January 15, 2020, a total of 366 hospitalized children ( $\leq 16$  years of age) were enrolled in a retrospective study of respiratory infections at three branches of Tongji Hospital, which are located 14 km to 34 km from one another in central Wuhan (Fig. S1 in the Supplementary Appendix, available with the full text of this letter at NEJM.org). The study was approved by the ethics committee of Tongji Hospital. Among the 366 children, the most frequently detected pathogens were influenza A virus (in 23 patients [6.3%]) and influenza B virus (in 20 [5.5%]). SARS-CoV-2, the virus that causes Covid-19, was detected in 6 patients (1.6%). In-

formed consent was obtained from the parents or guardians of the patients with Covid-19 for the publication of their clinical data. The dates of illness onset in the six patients with Covid-19 were between January 2 and January 8, 2020, and the patients were hospitalized between January 7 and January 13 (Fig. S2). Details of the study methods are provided in the Supplementary Appendix.

The median age of the six patients was 3 years (range, 1 to 7) (Table 1). All six children had previously been completely healthy. Common clinical characteristics included high fever ( $>39^{\circ}\text{C}$ ) (in all six patients), cough (in all six), and vomiting (in four). Laboratory investigations showed that the levels of lymphocytes, white cells, and neutrophils were below the normal range in six, four, and three patients, respectively. Four of the six patients had pneumonia, as assessed radiographically, with computed tomographic scans of the chest showing typical viral pneumonia patterns (Fig. S3). One child was admitted to the pediatric intensive care unit (ICU) and received pooled immune globulin from healthy donors. All the patients were treated empirically with antiviral agents, antibiotic agents, and supportive therapies. All the patients recovered after hospitalization for a median of 7.5 days (range, 5 to 13).

This study showed that Covid-19 occurred in children, causing moderate-to-severe respiratory illness, in the early phase of the SARS-CoV-2 outbreak in Wuhan and was associated with ICU admission in one patient. None of the patients or their family members had had direct exposure to Huanan Seafood Wholesale Market (the initial location to which cases of Covid-19 were linked) or to one another. It is worth mentioning that we unexpectedly found a case of Covid-19 in one

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**Table 1. Summary of the Clinical Characteristics of Six Children with Covid-19.\***

| Characteristic                     | Patient 1                                   | Patient 2 | Patient 3                    | Patient 4                    | Patient 5                    | Patient 6 |
|------------------------------------|---|-----------|------------------------------|------------------------------|------------------------------|-----------|
| Age (yr)                           | 3   | 7         | 3                            | 1                            | 3                            | 4         |
| Sex                                | Female                                      | Female    | Female                       | Male                         | Female                       | Male      |
| CT findings                        | Patchy ground-glass opacities in both lungs | NA        | Patchy shadows in both lungs | Patchy shadows in both lungs | Patchy shadows in both lungs | Normal    |
| Treatments                         |   |           |                              |                              |                              |           |
| Ribavirin                          | Yes   | No        | No                           | No                           | No                           | Yes       |
| Oseltamivir                        | Yes   | Yes       | Yes                          | Yes                          | Yes                          | Yes       |
| Glucocorticoids                    | Yes   | No        | Yes                          | Yes                          | Yes                          | No        |
| Supplemental oxygen                | Yes   | No        | No                           | No                           | No                           | No        |
| Intravenous immune globulin        | Yes   | No        | No                           | No                           | No                           | No        |
| Clinical course                    |   |           |                              |                              |                              |           |
| ICU admission                      | Yes   | No        | No                           | No                           | No                           | No        |
| Duration of fever (days)           | 11  | 3         | 7                            | 6                            | 4                            | 6         |
| Duration of hospitalization (days) | 13  | 7         | 7                            | 5                            | 10                           | 8         |
| City of residence                  | Wuhan                                       | Wuhan     | Huangshi                     | Wuhan                        | Wuhan                        | Wuhan     |

\* Covid-19 denotes coronavirus disease 2019, CT computed tomography, ICU intensive care unit, and NA not available.

patient (Patient 3) who resided outside Wuhan; this patient had illness onset on January 2, 2020. The patient and her family were residents of the Yangxin area of Huangshi and had not traveled outside the city in the month before illness onset. We have not identified the source of infection for this patient. Our findings indicate that SARS-CoV-2 infections in children were occurring early in the epidemic.<sup>4</sup>

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1. Zhu N, Zhang D, Wang W, et al. A novel coronavirus from patients with pneumonia in China, 2019. *N Engl J Med* 2020;382:727-33.
2. Wu Z, McGoogan JM. Characteristics of and important lessons from the coronavirus disease 2019 (COVID-19) outbreak in China: summary of a report of 72 314 cases from the Chinese Center for Disease Control and Prevention. *JAMA* 2020 February 24 (Epub ahead of print).
3. Li Q, Guan X, Wu P, et al. Early transmission dynamics in Wuhan, China, of novel coronavirus–infected pneumonia. *N Engl J Med* 2020;382:1199-207.
4. Lipsitch M, Swerdlow DL, Finelli L. Defining the epidemiology of Covid-19 — studies needed. *N Engl J Med* 2020;382:1194-6.

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