Successful Confinement of a Familial Cluster of COVID-19 in Qingdao, China, in the Early Phase of Pandemic

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From January 26, 2020 to February 3, 2020, a total of 7 confirmed cases and 2 asymptomatic infected persons were reported in Qingdao, China. These cases had no history of sojourning in Hubei Province, contact with animals, visits to markets, or eating game meat.

On January 19, 2020, patient 1, the initial case, returned to Qingdao from Kunming by air, a flight on which there were 2 persons from Wuhan City with fever. She developed fever, cough, and weakness on January 21, 2020. She went to an outpatient clinic near her community and was treated with intravenous cefazolin from January 23 to 24. Due to persistent symptoms, she was admitted to hospital on January 25, 2020, and diagnosed as a suspected case. The throat swab tested positive for coronavirus disease 2019 (COVID-19) by reverse transcriptase polymerase chain reaction (RT-PCR) on January 26, 2020.

Patient 2 lived together with her mother (patient 1), and the older daughter of patient 1 (patient 4) lived in the same community. Patient 1 had gone to the house of patient 4 many times since she returned to Qingdao. On January 20, patient 1 had lunch in her father’s house, which was in another community, with her father, sister, niece (asymptomatic infected person, patient 9), and granddaughter (patient 5). In the evening, the 2 daughters (patients 4 and 2), son-in-law (patient 3, husband of patient 4), grandson, and granddaughter (patient 5) had supper with patient 1 in the house of patient 4. Patient 3 and 4 took their children back to their parents’ home for the Spring Festival on January 23. The family visited their aunt (patient 6) and uncle-in-law (asymptomatic infected person, patient 8) on the evening of January 23. None wore surgical masks during the entire visit. Patient 7, who also did not wear a surgical mask, met patient 1 in the same clinic when patient 1 attended to the outpatient clinic (Figures 1 and 2). Due to the limited conditions in the early stage of the epidemic, nucleic acid testing lagged behind. If the nucleic acid testing of Case 9 was carried out before February 6, it would be more conducive to the prevention and control of the epidemic.

Through the field investigation, 115 persons were exposed during this cluster event, and the total infection rate was 6.09% (7/115). The infection rate of only this family was 41.18% (7/17).

As shown in our study, it was crucial to detect and isolate cases and trace and quarantine close contacts as early as possible, which was particularly important when PCR results were delayed. As our study had limitations. First, we only tested samples from patients. Samples from the environment were not obtained. Second, the isolated virus was not sequenced, and the homology analysis was not performed.
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References

