Asymptomatic cases in a family cluster with SARS-CoV-2 infection

Since December, 2019, an outbreak of pneumonia caused by a novel coronavirus, severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), has led to a serious epidemic in China and other countries, resulting in worldwide concern.[1] Family clusters of infected individuals have been reported, and this phenomenon could present a serious threat to public health if not strictly controlled. In a previously reported family cluster, most infected individuals had clinical symptoms, decreased lymphocyte counts, and abnormal chest CT images, and were positive for the virus on quantitative RT-PCR (qRT-PCR) analysis.[2,3] However, some of the family members had abnormal chest CT images and positive qRT-PCR results without any clinical symptoms.[3] Here, we report the clinical characteristics of a family cluster of SARS-CoV-2 infection. In this family of three, one 35-year-old man (patient 1) had clinical symptoms, a decreased lymphocyte count, abnormal chest CT images, and a positive result on qRT-PCR. By contrast, the other two family members—a 33-year-old woman (patient 2) and a 3-year-old boy (patient 3)—were both asymptomatic, with normal lymphocyte counts and chest CT images but positive qRT-PCR results (figure).

On Jan 22, 2020, patient 1 travelled from Wuhan (Hubei, China) to Guangzhou (Guangdong, China) with his wife (patient 2) and son (patient 3) by high-speed rail. On Jan 26, patient 1 developed a fever of 37·5°C, which lasted for 1 day. The next day, the patient presented to the Third Affiliated Hospital of Guangzhou Medical University with a body temperature of 37·4°C, and on the same day developed a sore throat, arthralgia, and myalgia, without chills or headache.

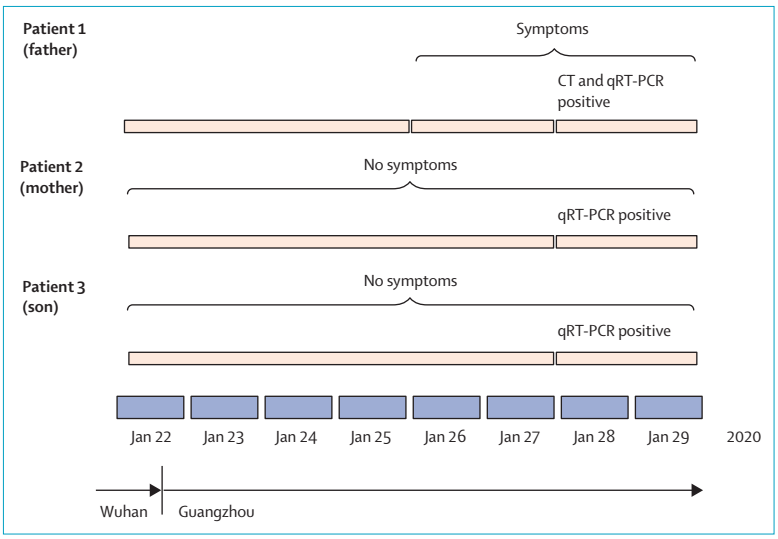

Figure: **Chronology of symptom onset and identification of positive SARS-CoV-2 findings on qRT-PCR and CT among the family cluster**
qRT-PCR=quantitative RT-PCR.

Patient 1 was observed from Jan 27 to Jan 29, during which time his body temperature normalised. On Jan 27, routine blood tests showed normal white blood cell and lymphocyte counts, but decreased lymphocyte percentage (appendix). Chest CT scans taken 2 days after symptom onset showed bilateral multiple lobular and subsegmental areas of ground-glass opacities and consolidation (appendix). Two sets of nasopharyngeal swab samples from patient 1 tested positive for SARS-CoV-2 on qRT-PCR.

Patients 2 and 3 had no signs or clinical symptoms during the same observation period (Jan 27–29), with no decreases in white blood cell or lymphocyte counts (appendix). Chest CT images taken from these two patients on Jan 28 did not show significant abnormalities. However, two sets of nasopharyngeal swab samples, taken at the same time as those from patient 1, tested positive for SARS-CoV-2 on qRT-PCR. All three family members were diagnosed with SARS-CoV-2 infection and were thus transferred to the Infectious Diseases Unit of the Eighth People's Hospital of Guangzhou for isolation and treatment.

In this family cluster, although all individuals tested positive for SARS-CoV-2 infection on qRT-PCR, only patient 1 showed clinical symptoms, decreased lymphocyte count, and abnormal chest CT images (figure). However, any of the three individuals could have been the first one to become infected and thus transmitted the virus to the other two family members. Importantly, asymptomatic patients (such as patients 2 and 3) might be unaware of their disease and therefore not isolate themselves or seek treatment, or they might be overlooked by health-care professionals and thus unknowingly transmit the virus to others.

To prevent and control this highly infectious disease as early as possible, people with family members with SARS-CoV-2 infection should be closely monitored and examined to rule out infection, even if they do not have any symptoms. In the case of this family, since the time between presentation and identification of SARS-CoV-2 infection was short, more studies are needed to observe the symptoms and test results of infected individuals in greater detail.

We declare no competing interests. XP and DC contributed equally to this work. Patient consent was obtained.

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See **Online** for appendix

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