Since January 2020 Elsevier has created a COVID-19 resource centre with free information in English and Mandarin on the novel coronavirus COVID-19. The COVID-19 resource centre is hosted on Elsevier Connect, the company's public news and information website.

Elsevier hereby grants permission to make all its COVID-19-related research that is available on the COVID-19 resource centre - including this research content - immediately available in PubMed Central and other publicly funded repositories, such as the WHO COVID database with rights for unrestricted research re-use and analyses in any form or by any means with acknowledgement of the original source. These permissions are granted for free by Elsevier for as long as the COVID-19 resource centre remains active.
Swift contact tracing can prevent transmission—Case report of an early COVID-19 positive case

Akhil Dhanesh Goel*, Pankaj Bhandwaj, Manoj Gupta, Nitesh Kumar, Vidhi Jain, Sanjeev Misra, Suman Saurabh, Mahendra K. Garg, Vijaya L. Nag

All India Institute of Medical Sciences, Jodhpur, India

A R T I C L E   I N F O

Article history:
Received 3 June 2020
Received in revised form
13 December 2020
Accepted 19 December 2020

Keywords:
Contact tracing
Coronavirus
Isolation
Quarantine

A B S T R A C T

This is a case study of a positive COVID-19 case who was diagnosed and isolated early on in the infection. However, her seventeen close contacts who were quarantined and under observation remained negative indicating no viable chain of transmission despite high-risk contact. We further discuss the importance of effective contact tracing coupled with strict isolation or quarantine in breaking the chain of transmission.

CASE STUDY

A detailed contact history revealed seventeen high-risk contacts, who were approached for contact tracing. A high-risk contact was defined as any individual with whom she had physical contact or living in the same household. Detailed definitions of high and low-risk contacts are described in Fig. 2. Four of her contacts were above fifty years of age — father (51 years), grandmother 1 (70 years), grandmother 2 (80 years) and grandfather (88 years). None of the contacts had any respiratory symptoms. Similarly, none of her contacts reported any history of travel outside Jodhpur. Their nasopharyngeal swabs tested RT-PCR negative for SARS-CoV-2. All were advised home quarantine for the next fourteen days. Repeat testing was not done as none of the high-risk contacts developed any symptoms. There were no low-risk contacts identified during the contact tracing.

DISCUSSION

This case highlights the importance of exhaustive contact tracing, coupled with timely testing and strict isolation/quarantine, for controlling the spread of COVID-19 infection. The index case had a high-risk exposure to a symptomatic COVID-19 positive individual in the closed train compartment for a duration of about 15 h. She was identified through contact tracing and isolated on the sixth day post-exposure.

The incubation period of SARS-CoV-2 is estimated to be about 5–6 days (range 1–14 days) [1]. While symptomatic disease is
mainly associated with transmission of SARS-CoV-2, there is clear evidence regarding transmission from asymptomatic cases [2].

The case-study highlights that despite being in close vicinity of an RT-PCR positive individual, none of her household contacts tested positive for SARS-CoV-2. The reasons for the same could be absence of cough/sneezing in the index case because of which active droplet production was minimal, a possibly low infectivity dose in her other secretions, a good personal hygiene, adequate hand hygiene and social distancing norms followed by the entire family and timely isolation instituted by the authorities. The possibility of false negative RT-PCR results in all 15 family members is unlikely. However, as they were tested only once, they may not yet have developed enough viral load as this was very early in the incubation period and there is a possibility that as the viral loads increase, the risk of transmission increases. Any asymptomatic infection developed may also have remained undetected.

While all the contacts were asked to observe strict home quarantine, an absence of symptoms during the 28-day period after last exposure was ensured and hence a repeat testing was not done in any of the high-risk contacts.

Another consideration is that of false-positives and false-negatives when using RT-PCR. Although the exact values of
Conclusion

A.D. Goel et al.

sensitivity and specificity of the test are dependent on many factors, there are ample reports acknowledging non-reliance on RT-PCR for COVID-19 diagnosis. In light of variation of findings from various studies, a sensitivity of 70% and specificity of 95% has been conservatively suggested [3]. In our case, the presence of a positive RT-PCR beyond 14 days maybe because of prolonged shedding of non-viable viral particles which otherwise may also not be potent in disease transmission. There are reports of some positive cases who after testing negative, again tested positive [4] — maybe due to a similar mechanism of shedding of non-viable viral RNA.

Similarly, the negative tests in all the high-risk contacts may be a false negative result due to early phase of infection. Such negative RT-PCR tests has also been reported in symptomatic patients early on in the natural history of disease [5].

The information regarding COVID-19 is rapidly evolving. Effective contact tracing coupled with prompt and strict case isolation has the potential to control the outbreak [6]. The National Centre for Disease Control (NCDC), Government of India has given detailed guidelines on contact tracing for COVID-19 summarised in Fig. 2. WHO has issued an interim guidance and has also reiterated the importance of contact tracing coupled with rapid testing and isolation in targeting transmission levels and breaking the chain of infection [7].

Case-study presented here highlights the importance of swift contact tracing such that transmission could be interrupted. Not all positive cases spread infection, especially in the absence of symptoms and early on in the incubation period. A thorough contact tracing coupled with isolation/quarantine will go a long way in prevention of transmission.

Funding

No funding sources.

Competing interests

None declared.

Ethical approval

Not required.

References

[1] Q&A on coronaviruses (COVID-19); 2020. Available from: https://www.who.int/emergencies/diseases/novel-coronavirus-2019/question-and-answers-hub/q-a-detail/q-a-coronaviruses. [Cited 28 May 2020].
[2] Rothe C, Schunk M, Sothmann P, Bretzel G, Froeschl G, Walrauch C, et al. Transmission of 2019–NCoV infection from an asymptomatic contact in Germany. N Engl J Med 2020;382:970–1. Massachusetts Medical Society.
[3] Watson J, Whiting PF, Brush JE. Interpreting a covid-19 test result. BMJ 2020;369.
[4] Lan L, Xu D, Ye G, Xia C, Wang S, Li Y, et al. Positive RT-PCR test results in patients recovered from COVID-19. J Am Med Assoc 2020;323:1502–3.
[5] Long C, Xu H, Shen Q, Zhang X, Fan B, Wang C, et al. Diagnosis of the coronavirus disease (COVID-19): rRT-PCR or CT? Eur J Radiol 2020;126:108961.
[6] Hellewell J, Abbott S, Gimma A, Bosse NI, Jarvis CI, Russell TW, et al. Feasibility of controlling COVID-19 outbreaks by isolation of cases and contacts. Lancet Glob Health 2020;8(4):e488–96.
[7] WHO. Contact tracing in the context of COVID-19: interim guidance; 2020.