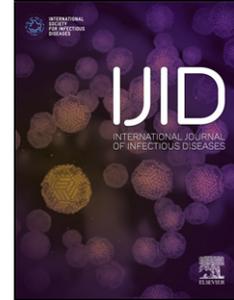


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Positive effects of COVID-19 control measures on influenza prevention

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Author contributions: Di Wu, Jianyun Lu, and Lei Luo designed the study and drafted the manuscript; Yanhui Liu collected and analyzed the data; Zhoubin Zhang and Lei Luo revised the manuscript. All authors read and approved the final manuscript.

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Running heads:

Recto: COVID-19 control measures and influenza prevention

Verso: D. Wu et al.

KEYWORDS

COVID-19; SARS-CoV-2; Influenza, Control

Abstract [Au?1]

Coronavirus disease 2019 (COVID-19) caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) has now become a pandemic threat to the whole world. At the same time, influenza virus has been active, with influenza virus and SARS-CoV-2 sharing the same transmission routes. This article aims to alert clinicians of the presence of co-infection with these two viruses and to describe the effect of the measures taken to fight COVID-19 on influenza prevention and control.

[TEXT]

The coronavirus disease 2019 (COVID-19) outbreak caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which started in late 2019, has now become a worldwide disaster [1]. According to the World Health Organization (WHO) [2], as of March 31, 2020, more than 750 890 cases had been confirmed, including 36 405 deaths.

COVID-19 is an infectious respiratory disease that shares the same routes and means of transmission as influenza [Au?1]. A relatively high level of reported influenza cases and influenza-like illness (ILI) has been observed in China over the last year, with the same trend reported in the United States and by the WHO [3]. Wu et

al. [4] have reported the case of a patient co-infected with SARS-CoV-2 and influenza A virus. Also, Li and Wang [5] have reported the need to be alert to the superposed effect of seasonal influenza while fighting pneumonia caused by the novel coronavirus.

According to the Chinese National Influenza Center, ILI activity (ILI%) in 2020 in South China was lower than that in North China from week 5 to week 10, and this situation reversed in the subsequent 2 weeks; in contrast, in 2019, ILI% was constantly higher in South China than in North China for the first 11 weeks (except for the first week of 2019) (Figure 1A) [Au?1]. Overall, ILI% in 2020 across the whole of China has been higher than that observed in 2019, and the same trend has been observed in the positive rate of specimens (Figure 1B).

[Figure 1 here]

Guangzhou City, in South China, has also seen a relatively higher ILI% over the last 7 weeks of 2020 [Au?2] when compared to 2019 (Figure 1C), and the overall positive rate of specimens has been lower in 2020 when compared to 2019 (Figure 1D) [Au?3]. However, reported cases of COVID-19 in Guangzhou City decreased continuously from week 6 to week 11 of 2020, when the local transmission of COVID-19 then ceased in Guangzhou City [Au?1]. There has since been a dramatic increase in cases; all of these have been reported to be imported cases (Figure 1E) [Au?1]. At the same time, the number of reported influenza cases showed a decreasing trend from the beginning of 2020, while there were two growth waves in 2019 during the same period (Figure 1F) [Au?1].

We performed an analysis and found that the measures taken by the Chinese government to control SARS-CoV-2 also controlled the transmission of influenza virus, since these two viruses share the same routes and means of transmission: (1) nucleic acid testing was performed on all suspected patients, so the patients infected with influenza were also identified; (2) people were quarantined, therefore limiting the possibility of transmission of the infection to others; (3) social lockdown at the earliest onset of the outbreak meant that the possibility of transmission was even smaller; (4) the whole population were wearing facemasks, better protecting themselves from the infection; (5) there was extensive screening for fever cases, thereby reducing infection sources; (6) screening of close contacts of confirmed cases and suspected cases was performed, further reducing the number of infection sources [Au?1]. Thus, there would be a positive effect on influenza prevention and control, as well as on other infectious respiratory diseases, which may also have been prevented to some extent while fighting the pandemic of COVID-19.

Declarations

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Conflict of interest: None.

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Figure caption

Figure 1 [Au?4].

Highlights [Au?1]

- Influenza virus transmission may be stopped while fighting the severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) outbreak.
- Influenza cases decreased dramatically following the application of coronavirus disease 2019 (COVID-19) control measures.
- Other respiratory infectious diseases may also be prevented to some extent while fighting the pandemic of COVID-19.

Figure 1. Positive effects of COVID-19 control measures on influenza prevention.

A) The influenza-like illness (ILI) of the first 10 weeks of the year, China. **B)** the positive rate of the specimens of the first 10 weeks of the year, China. **C)** The influenza-like illness (ILI) of the first 10 weeks of Guangzhou City. **D)** The positive rate of the specimens of the first 10 weeks of the year, Guangzhou City. **E)** the reported cases of COVID-19 in Guangzhou City. **F)** the reported cases of influenza in Guangzhou City.