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Is the 2019 novel coronavirus related to a spike of cosmic rays?

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Abstract

WHO's pronouncement of the 2019 novel coronavirus outbreak as a pandemic disease came months after we published a warning that the present deepest minimum of the sunspot cycle would be likely to facilitate the onset of a viral pandemic. During a deep sunspot minimum (deepest in 100 years) such as we are now witnessing, two space related phenomena could have an effect on the disposition of viral disease and potential pandemics. With the weakening of the magnetic field in the Earth's vicinity, there would be a high flux of mutagenic cosmic rays. These processes would be likely to herald the onset of new pandemics. Neutron counts from Moscow Neutron Monitor show that the flux of cosmic rays reaching Earth in 2019 was indeed at a maximum over a timespan of half a century since 1962. It is of interest to note that immediately prior to the first recorded cases of the novel Corona virus in China a peak of cosmic rays was measured as is indicated by the Huon neutron monitor data. Recent research revealed that estimates of the timing of the most recent common ancestor of COVID-19 made with current sequence data point to emergence of the virus in late November 2019 to early December 2019, compatible with the earliest retrospectively confirmed cases and the cosmic ray spike in late November 2019. In our view, this strong cosmic ray spike was in some way connected with the onset of the outbreak.

On December 31, 2019, a cluster of pneumonia of unknown etiology was reported in Wuhan City, Hubei Province of China. Although the outbreak of pneumonia was determined to be caused by the 2019 Novel Coronavirus (COVID-19), the true cause of its sudden emergence remains unclear.

K.G. Andersen, recently wrote in *Nature Medicine* that scientific evidences show that the new coronavirus is the result of natural evolution, not laboratory synthesis (Andersen, Rambaut, Lipkin, et al., 2020). Here, we can scientifically explain this conclusion in further. Generally speaking, there are several ways that are normally considered for the emergence of new viruses. One is that these are viruses that exist in nature but have not yet been detected and suddenly emerge in humans through cross-species transmission, or transfer from the atmosphere; the other is that endemic viruses undergo gene recombination, mutation to finally generate new pathogens. SARS-CoV and MERS-CoV are both presumably recombinants (Huang, Liu, Xu, et al., 2016; Sabir, Lam, Ahmed, et al., 2016), and our previous studies have shown that their emergence were somehow associated with double peaks in the sunspot cycle in 2002 and 2012 (Qu & Wickramasinghe, 2017). The Novel Coronavirus has been argued by some to have gained the ability to infect people through gene recombination and thus ultimately create a major public health threat on a world-wide scale (Ji, Wang, Zhao, et al., 2020).

According to the data of Sunspot Index and Long-Term Solar Observations, we are now approaching the deepest sunspot minimum for a century. There were 273 spotless days in 2019 and no sunspots for 40 days from November 14 to December 23, 2019. The Sun's magnetic field is very weak, thus allowing an increased flux of cosmic rays as well as charged dust particles (including viruses) to be incident on the Earth. Neutron counts from Moscow Neutron Monitor show that the flux of cosmic rays reaching Earth in 2019 is at a maximum over a timespan of half a century since 1962. It is of interest to note that immediately prior to the first recorded cases of the novel Corona virus in China a peak of cosmic rays was measured as is indicated by the Huon neutron monitor data in Fig. 1. Estimates of the timing of the most recent common ancestor of COVID-19 made with current sequence data point to emergence of the virus in late November 2019 to early December 2019, compatible with the earliest retrospectively confirmed cases (Huang et al., 2020) and the cosmic ray spike in late November 2019. Hence, we suggest that this strong cosmic ray spike was in some way connected with the onset of the outbreak.

A peak of cosmic rays occurring at a deep solar minimum not only shows the Earth's greater vulnerability to mutagenic effects on viruses already on the ground, but also through a weakening of the Earth's magnetic field environment, there would be an enhanced ingress of charged cosmic dust. In a series of papers (Wickramasinghe, Steele, Gorczynski, & Temple, 2020, 2020b, 2020c) the possibility of cometary dust laden with viruses as a

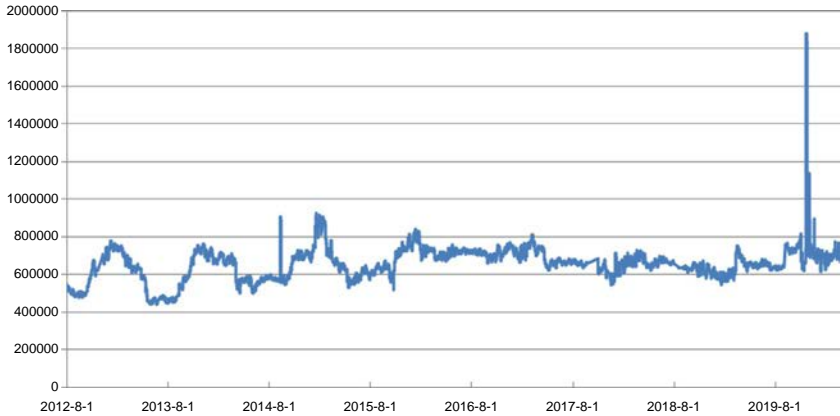


Fig. 1 Cosmic ray variations by the Huon neutron monitor data in China.

primary cause of the COVID pandemic has been discussed. In either case the mutagenic effect of cosmic rays could influence the course of the pandemic by affecting the evolution of the circulating virus after it is introduced into the human population.

Point mutations, gene recombination and gene reassortment are thought to be the three basic mechanisms of viral emergence and/or evolution. Solar radiation and cosmic rays are physical mutagens possibly leading to natural point mutations and can in this way lead to the emergence of new or modified viruses. Recombination and reassortment of viral genes occur at highly variable frequencies in viruses with RNA as their genetic material. Multiplicity reactivation and cross-reactivation have also been proven to be general mechanisms of genetic recombination. Such reactivation has been observed in influenza viruses irradiated by various types of radiations such as ultraviolet light and gamma rays, in laboratories during the 1950s–60s. In a recent study we proposed that solar radiation and cosmic rays could lead to genetic mutation/recombination, and can thus cause the emergence of some modified viruses such as those responsible for pandemic influenza (Qu, 2016).

Cosmic rays can inactivate corona viruses, but the resulting seemingly noninfectious inactivated viruses are in fact semi-infectious. Semi-infectious virus particles deliver an incomplete set of viral genes to the cell that can, given a suitable trigger (cosmic rays), be provoked to become infective (Qu, 2016).

In a letter to *Current Science* published in November 2019, we also explicitly reminded the world that new infective viruses are likely to emerge in the

coming months during the lowest minimum of the sunspot cycle in over a 100 years, and that public health authorities must be vigilant and take necessary action (Wickramasinghe, Wickramasinghe, Senanayake, et al., 2019). The emergence of the COVID-19, in our view, confirms this prediction and highlights the urgency of taking appropriate precautions without further prevarication.

Acknowledgments

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Competing interests

The authors have declared that no competing interests exist.

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