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Stability of SARS coronavirus in human specimens and environment and its sensitivity to heating and UV irradiation

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Abstract

Objective: The causal agent for SARS is considered as a novel coronavirus that has never been described both in human and animals previously. The stability of SARS coronavirus in human specimens and in environments was studied.

Methods: Using a SARS coronavirus strain CoV-P9, which was isolated from pharyngeal swab of a probable SARS case in Beijing, its stability in mimic human specimens and in mimic environment including surfaces of commonly used materials or in household conditions, as well as its resistance to temperature and UV irradiation were analyzed. A total of 10(6) TCID₅₀ viruses were placed in each tested condition, and changes of the viral infectivity in samples after treatments were measured by evaluating cytopathic effect (CPE) in cell line Vero-E6 at 48 h after infection.

Results: The results showed that SARS coronavirus in the testing condition could survive in serum, 1:20 diluted sputum and feces for at least 96 h, whereas it could remain alive in urine for at least 72 h with a low level of infectivity. The survival abilities on the surfaces of eight different materials and in water were quite comparable, revealing reduction of infectivity after 72 to 96 h exposure. Viruses stayed stable at 4 degrees C, at room temperature (20 degrees C) and at 37 degrees C for at least 2 h without remarkable change in the infectious ability in cells, but were converted to be non-infectious after 90-, 60- and 30-min exposure at 56 degrees C, at 67 degrees C and at 75 degrees C, respectively. Irradiation of UV for 60 min on the virus in culture medium resulted in the destruction of viral infectivity at an undetectable level.

Conclusion: The survival ability of SARS coronavirus in human specimens and in environments seems to be relatively strong. Heating and UV irradiation can efficiently eliminate the viral infectivity.

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