

Differential Detection of Antibodies Specific to Bat Coronavirus in the Bat Biologists in Taiwan

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Background/Objective

Bats have been proved natural reservoirs of severe acute respiratory syndrome (SARS) and Middle East respiratory syndrome (MERS)-coronavirus (CoV) and the existence of bat CoV has been confirmed by the detection of viral RNA using reverse transcription polymerase chain reaction (RT-PCR) in the bat population in Taiwan. Potential zoonotic risk of bat CoV urged a serological survey of antibodies to bat CoV amongst bat biologists, who are at the highest risk of exposure to bat CoV due to bites and scratches by bats and frequent contacts of bat feces and blood.

Method

In 2014, 63 bat biologists have participated in this study and 37 of them have given informed consent for blood samples subjected to the antibody testing against three nucleocapsid (N) protein fragments of *Scotophilus* bat CoV 512 by Western blot assay. The N2 fragment contained conserved motif sharing by all known CoVs. The N1 and N3 fragments represented antigenic specificity.

Result

Over half of participants have handled bats before and 86% of them have exposed to bat feces in over 50% of encounters. About 75% of participants have experienced bites or scratches by bats. Serum from the patient recovered from SARS-CoV infection and 9 out of 37 participants showed positive to the cross-reactive N2 fragment but negative to the antigen specific N1 and N3 fragments, indicating the antibodies detected were induced by the previous infection of CoV but not *Scotophilus* bat CoV 512. The rest 28 serum samples showed negative to all three N fragments, indicating no CoV-specific antibodies existed at all.

Conclusion

A differential assay to detect cross-reactivity and bat CoV-specific antibodies was developed. In this study, no *Scotophilus* bat CoV 512-specific antibodies were detected in human serum samples and the risk of infection with *Scotophilus* bat CoV 512 is low even in the bat biologists.