

Sniffer dogs as a screening/diagnostic tool for COVID-19: a proof of concept study

Summary: Sniffer dogs are able to detect certain chemical particles and are suggest to be capable of helping diagnose some medical conditions and complications, such as colorectal cancer, melanoma, bladder cancer, and even critical states such as hypoglycemia in diabetic patients. With the global spread of COVID-19 throughout the world and the need to have a real-time screening of the population, especially in crowded places, this study aimed to investigate the applicability of sniffer dogs to carry out such a task

Methods-Results: Firstly, three male and female dogs from German shepherd (Saray), German black (Kuzhi) and Labrador (Marco) breeds had been intensively trained throughout the classical conditioning method for 7 weeks. They were introduced to human specimens obtained from the throat and pharyngeal secretions of participants who were already reported positive or negative for SARS-COV-2 infection be RT-PCR. Each dog underwent the conditioning process for almost 1000 times. In the meantime another similar condition process was conducted on clothes and masks of COVID-19 patient using another three male and female dogs from Labrador (Lexi), Border gypsy (Sami), and Golden retriever (Zhico) breeds. In verification test for the first three dogs, 80 pharyngeal secretion samples consisting of 26 positive and 54 negative samples from different medical centers who underwent RT-PCR test were in a single-blind method. In the second verification test for the other three dogs, masks and clothes of 50 RT-PCR positive and 70 RT-PCR negative cases from different medical center were used. In verification test using pharyngeal secretion, the sniffer dogs' detection capability was associated with a 65% of sensitivity and 89% of specificity and they amanged to identify 17 out of the 26 positive and 48 out of the 54 true negative samples. In the next verification test using patients' face masks and clothes, 43 out of the 50 positive samples were correctly identified by the dogs. Moreover, out of the 70 negative samples, 65 samples were correctly found to be negative. The sensitivity of this test was as high as 86% and its specificity was 92.9%. In addition, the positive and negative predictive values were 89.6 and 90.3%, respectively.

Conclusions: Dogs are capable of being trained to identify COVID-19 cases by sniffing their odour, so they can be used as a reliable tool in limited screening.