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Covid-19 Disease is the Current Challenging Global Public Health

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Description

Early diagnosis of SARS-CoV-2 coronavirus is the key for quick management of COVID-19 cases and control of the spread of the coronavirus based on the appropriate sample collection. Nowadays, the rapid, accurate and promising molecular laboratory diagnosis assay (such as RT-PCR, microarray, LAMP, point-of care, CRISPR) for detections of SARS-CoV-2 RNA of pathogenic coronaviruses would be valuable to controlling the sources of infection, prevent subsequent secondary spread, saving people's lives and help patients to prevent the illness evolution.

The novel, pandemic Coronavirus Disease-19 (COVID-19) is the current challenging global public health concern infectious human disease, caused by the Severe Acute Respiratory Syndrome Coronavirus-2 (SARS-CoV-2). SARS-CoV-2 is a positive-sense, single-stranded RNA virus. Initially, this coronavirus outbreak form Wuhan city, China, in December 2019 and speedily spread to other regions of china and other countries around the world. On March, 2020 the WHO upgraded the status of the Coronavirus Disease (COVID-19) outbreak from epidemic to a global pandemic. The causative agent of COVID-19 disease, Coronavirus (SARS-CoV-2) is contagious and can transmit from an infected person having a respiratory tract symptoms (such as high fever and headache, cough, muscle pain, fatigue, shortness of breath, weakness) to a non-infected person during the incubation period of 2 days to 14 days *via* coughing, exhaling, sneezing with small droplets from nose or mouth and then settle on air in the environment or in inanimate surfaces like metal, glass or plastic for up to 9 days and further infecting humans who breathe or touch these places and then touch their body parts such as mouth, nose, eye. However, some infected patients show few to no signs of illness during the early phase of infection but can still transmit the virus to non-infected persons. Since December 2019 up to 13 June 2020, many people were infected with COVID-19 cases, and many people were died worldwide at the time of writing this review, which implies that the virus has a great ability to spread, adapt and survive in different environmental conditions. Some finding suggests that aged people and humans with pre-existing health problems including cancer, HIV/AIDS, diabetes, heart disease, lung disease are more vulnerable to acquire the COVID-19 and develop serious illness more often than others. The WHO recognized the battle against this deadly human coronavirus *via* interrupting human-human contact or apply social distance, taking face mask, home care or stay home and isolate patients at early stages or self-quarantine measures to reduce the transmission and keep the virus from spreading to others. But some cases call for more complex of keeping the outbreaks of the virus due to improper disposal of used materials masks, some infected persons with no signs, peoples have no staying at home due to lack of daily meals, inadequate risk assessment regarding the urgency of the situation. So that early diagnosis of COVID-19 via molecular diagnostic assay is vital to minimize its spread. This review briefly describes the molecular diagnostic testing approaches for detection of novel COVID-19 infection.

Molecular Diagnostic Assay for Detection of COVID-19 Disease

After the proper sample collection, clinical specimens should be sent to the core laboratory immediately for extraction of nucleic acid using approved viral isolation kits and for the diagnosis of COVID-19 infection. Early diagnosis of COVID-19 is crucial for the timely management and isolation of confirmed cases to prevent further transmission of coronavirus. The major challenges in the diagnosis of COVID-19 are ways of appropriate sample collection and transport, and kit or equipment validation. The rapid and accurate molecular assays for detections of SARS-CoV-2 RNA of pathogenic coronaviruses COVID-19 disease, which would be valuable to controlling the sources of infection, prevent subsequent secondary spread, saving people's lives, help patients to prevent the illness evolution and play a vital role in selecting appropriate preventions and treatments. Molecular biology, has given the various gold standard rapid, accurate and promising methods currently available for the molecular detection of coronavirus SARS-CoV-2 RNA.

Contamination of Regular Touch Surfaces in Healthcare and Family Settings

Now a days, Coronavirus Disease 19 (COVID-19) is a challenging task globally, when the virus spreads from infected person to non-infected person by droplet infection transferred in to air, environment and inanimate objects. Contamination of regular touch surfaces in healthcare and family settings, hotels and bedrooms, public transport vehicles are a potential source of viral transmission form person-to-person. The WHO indorses to apply the environmental surface cleaning via disinfectant agents effectively and consistently. Some of the inanimate surface disinfectant detergents to decrease human coronavirus infectivity within 1 min exposure time are 62%-71% ethanol, 0.5% hydrogen peroxide effectively. Early diagnosis of COVID-19 disease is the key for rapid management of the infection and also control further spread of the virus. Molecular diagnostic assays such as Reverse Transcription-Polymerase Chain Reaction (RT-PCR), LAMP-based nucleic acid amplification assays, molecular point-of-care testing-based assays and CRISPR-based methodologies are the current essential and promising alternatives used for easily diagnosis of SARS-CoV-2 RNA. However, an ongoing research is critical to investigate the efficient and more cost-effective diagnostic tools for detection of COVID-19 infection.

Further Perspectives

Currently the number of confirmed cases of COVID-19 and death of humans rises rapidly throughout the world and remain an ongoing challenge in the fight against this deadly disease. To overcome these

challenges, several rapid diagnostic tests have been developed. However, COVID-19 requires more highly specific rapid, inexpensive, non-invasive and easy-to-use point-of-care diagnostic tests with high sensitivity. Also the cost- effective, point-of-care test kits that must be produced widely in mass quantities in order to speed up the response time for treatment and distributed throughout the world especially resource-limited countries and developing countries to minimize the current COVID-19 pandemic related pressure on health systems or lower the risk of spreading infection, and used it at airports and national borders to screen individuals and avoid imported cases of the COVID-19 infection.