Elucidating the sensitivity and specificity of reverse transcription–polymerase chain reaction (RT-PCR) and rapid test kit (RTK) Antigen test in diagnosing COVID-19 status in Hospital Shah Alam

Muda Salihah[1], Saharudin Siti Nurhafizah[2], Mohd Dani Nurul Husna[1], Lim Jia Min[1], Umur Nurulhuda[1], Yakub Ahmad Fakri[1], Salehuddin Nur Aqila Syafiqa[2], Mohd Lootfi Alya Nazirah[2], Yamang Haizat[2]

[1]Pathology Department, Hospital Shah Alam, [2]Clinical Research Center, Hospital Shah Alam

ABSTRACT

Introduction: RTK-Antigen and RT-PCR-Antibody tests are the two most common diagnostic methods for detecting SARS-CoV-2 infection. Both tests are equally essential and widely applied. **Materials and Methods:** This is a retrospective, cross-sectional observational study involving data collection of specimen results for RTK-Antigen and RT-PCR-Antibody for detecting COVID-19 infection in Hospital Shah Alam from 1st January 2021 until 31st July 2021. Secondary data is collected using electronic medical records from the pathology department database and Hospital Information System (HIS). **Results:** During the study period, 1,961 patients were tested using both RTK-Antigen and RT-PCR-Antibody tests to diagnose COVID-19 infection. Out of these 1961 patients, 684 (34.88%) tested positive and 1277 (65.22%) were negative for SARS-CoV-2 RNA by RT-PCR assay. The RTK-Antigen detection test's sensitivity and specificity were 74.56% (95% CI, 71.30 - 77.86%) and 98.98% (95% CI, 98.43 - 99.53%), respectively. The positive predictive value was 97.51% (CI 95%, 96.18 - 98.85%) and the negative predictive value was 87.90% (CI 95%, 86.21 - 89.59%). **Conclusion:** The RTK-Antigen detection showed low sensitivity but very high specificity compared with the RT-PCR assay. Despite these results, RTK-Antigen is largely recommended for the early detection of patients suspected of having COVID-19, particularly in densely populated and isolated locations. It is also useful for prompt diagnosis in central cities or rural areas. Ideally, the negative RTK-Antigen samples still need to be further analyzed using molecular tests to confirm the results. However, with the rapid development of vaccines, the requirement to definitively confirm the diagnosis has loosened and become less stringent.

Keywords: RTK-Antigen, RT-PCR, COVID-19

Seizure in acute COVID-19 infection: Not just a meningoencephalitis

Abdullah Arief Aminuddin, Mohd Fazrul Mokhtar, Julina Md Noor, Nurul Huda Ahmad, Muhammad Nur Azmi Baharuddin

Hospital Universiti Teknologi MARA, Selangor

ABSTRACT

Summary: Seizure is rarely a presenting symptom of COVID-19 infection. Neurological manifestations happen through direct invasion into the nervous system or through activation of the systemic inflammation. A healthy 13-year-old boy presented with one episode of seizure and fever for 2 days. On arrival, he was in post-ictal, febrile with stable haemodynamics. In view of poor Glasgow coma scale recovery, he was intubated and antibiotics were also given. Computed tomography brain contrast showed meningoencephalitis changes. Biochemistry tests from lumbar puncture revealed viral pictures while cultures were negative. The polymerase chain reaction was positive for COVID-19. While in the intensive care unit, he had hypotension and echocardiogram demonstrated pericardial effusion and reduced ejection fraction. He was treated for multisystem inflammatory syndrome (MIS-C) and given immunoglobulin and methylprednisolone. His condition improved and no seizure reported. After 7 days, he developed another seizure which then he was decided for plasma exchange therapy. He recovered well and was discharged after 31 days of admission. The incidence of encephalitis amongst COVID-19 patient was 0.215%. Less than 1% of paediatric population with confirmed SARS-CoV-2 infection is prone to develop MIS-C as a consequence of hyperinflammatory state. It typically occurs within 2-6 weeks after SARS-CoV2 infection. This case depicts otherwise as this patient developed MIS-C during his active SARS-CoV2 infection. Our case highlights the need to look for indicators of MIS-C particularly in COVID-19 individuals who do not present with typical symptoms as the treatment is substantially different.