IVD_08 - Evaluation of Influenza A and SARS-CoV2 detection using RT-PCR by paired saliva and nasopharyngeal secretions samples

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Introduction: The Human Influenza Virus (IFV) and severe acute respiratory syndrome coronavirus 2 (SARS- CoV2) are both etiologic agents for acute upper respiratory diseases and can be lethal. Both can evolve and spread rapidly, being an outbreak risk, like global H1N1 2009 and COVID19 pandemics. Samples of nasopharyngeal secretion (NS), followed by RT-PCR, is the gold standard detection method. However, saliva could be an alternative sampling, being more attractive since is painless and easy to collect, mainly in children.

Objectives: The aim of this project was evaluate the sensitivity and specificity of IFV and SARS-CoV2 detection comparing saliva and NS by multiplex RT-PCR.

Methodology: The samples were collected at LIGH-UFPR (Curitiba, Paraná) between April to August 2022. A trained team performed the nasopharyngeal secretions sampling, using a nasal swab in viral transport medium. For saliva samples, it was self-collected. The RNA extraction was performed by automated magnetic beads system, using the RNA and DNA Viral kit on EXTRACTA, as suggested by manufacturer. The detection of SARS-CoV2 and IFV were performed by RT-PCR using INFA/INFB/SC2 Bio-Manguinhos Molecular Assay on QuantStudio 5™ according to the manufacturer instructions.

Results: 665 samples were paired collected, saliva and NS. For Influenza A (IFAV), it was detected in 46 patients, being 45 (97,8%) confirmed in NS samples and 42 (91,3%) in saliva. Regarding SARS-CoV2, 191 patients were diagnosed as positive, being 180 (94.2%) positive for NS and 178 (93.2%) on saliva samples. It was not found any positive Influenza B samples. Three samples were detected both for SARS-CoV2 and Influenza coinfection, a condition also known as Flurona, however only two samples were detected in NS, while the other one only in saliva. It was found higher Ct values for saliva than NS samples for both viruses. The variation in the percentage of positivity for IFAV between NS and saliva were about 6,65% while for SARS-Cov2, the result ranged from 27%. The discordancy for IFAV was 2,1% for NS and 8,6% for saliva. For SARS-CoV2, was 7,3% for NS and 6,8% for saliva. The analysis for specificity was 100% for both types of samples for IFV and SARS-CoV2. The sensibility was 98% for NS and 97% for saliva for IFAV, while for SARS-CoV2 was 94% and 93% respectively for both types of samples.

Conclusion: The results found indicate effectiveness diagnosis for saliva samples. The discordance observed can be correlated with the progression of the disease and the fact that the presence of viral loads in the NS and in the saliva may be different. The results demonstrate an efficient detection of IFV and SARS-CoV2 using both specimen for diagnostic purposes.

Keywords: RT-PCR, SARS-CoV2 and Influenza detection, Saliva sampling