Comparison of the Allplex Respiratory Panels RP1a, RP2, RP3 and Pneumobacter to Luminex NxTAG Respiratory Pathogen Panel for detection of respiratory pathogens

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METHODS

INTRODUCTION

The Kelowna General Hospital (KGH) refers all extended viral testing to a reference laboratory, which is associated with considerable delays.

Implementation of extended respiratory pathogen testing would improve patient care by making results available faster.

This study compares the performance of the Seegene Allplex Respiratory Panels (RP) RP1a, RP2, RP3 and Pneumobacter (PB) to NxTAG Respiratory Pathogen Panel (RPP) (Luminex Molecular Diagnostics) for extended respiratory pathogen testing.

METHODS

• 235 specimens and 190 eluates were obtained from the Kelowna General Hospital (KGH) or BC Centre for Disease Control (BCCDC) freezers, after storage at -80°C.

RESULTS

• Allplex RPs provided accurate results in 96.7% of specimens.

• Results are summarized in Table 2.

• Sensitivity for Influenza A was 100% when overall detection was evaluated, with at least one of the targets (Flu A, Flu A H1N1, pdm09, Flu A H3N2) being positive.

• Sensitivity was more than 90% for all targets except Parainfluenza virus 2 (PIV2) and Coronavirus OC43.

• The Allplex PIV 2 target was only 51.9% sensitive compared to the NxTAG RPP assay.

• PIV 2 false negative specimens were re-tested on the Allplex RVEA, and were also found to be negative.

Table 2: Summary of Results

<table>
<thead>
<tr>
<th>Panel</th>
<th>Targets</th>
</tr>
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<tbody>
<tr>
<td>RP1a</td>
<td>Influenza A, Influenza A H1pd09, Influenza A H3, Influenza B, Respiratory syncytial virus A, Respiratory syncytial virus B</td>
</tr>
<tr>
<td>RP2</td>
<td>Adenovirus, Enterovirus, Metapneumovirus, Parainfluenza viruses 1/2/3/4</td>
</tr>
<tr>
<td>RP3</td>
<td>Coronavirus OC43/229E/NL63, Rhinovirus</td>
</tr>
<tr>
<td>PB</td>
<td>L_pneumophila, Mycoplasma_pneumoniae, Chlamydophila_pneumoniae</td>
</tr>
</tbody>
</table>

| Methods (Cont’d) |

• Specimens tested at BCCDC were extracted on the MagMAX Express-96 Deep Well Magnetic Particle processor using the viral RNA isolation kit.

• NxTAG RPP testing was performed on specimens using the procedure outlined in the product insert.

• Seegene Allplex testing was performed at KGH, following the protocol outlined in the product inserts.

• Specimens were extracted using the Hamilton Microlab STARlet and run on the Bio-Rad CFX96 Real-time PCR system.

• Specimens were considered to be true positives if NxTAG RPP and Allplex RP assays produced the same result.

• Discordant isolates were run on the Seegene Allplex Respiratory virus essentials assay (RVEA), and if the same result was obtained on at least 2/3 assays it was considered a true positive.

• When discrepancies remained the original NxTAG RPP result was re-examined, and in some cases the eluates were sent to the BCCDC, or another reference laboratory at St. Paul's Hospital for re-testing.

CONCLUSION

• Allplex panels performed well, and provided comparable results to the NxTAG RPP in most cases.

• However, sensitivity was poor for PIV 2, consistent with findings reported by Kong et al at AMMI/CACMID 2019.

• Seegene has subsequently reformulated the RP2 panel for improved performance for PIV 2, however this requires further evaluation.

ACKNOWLEDGEMENTS

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