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Utility of Copan MSwab and Altona RealStar® alpha herpesvirus PCR for detection of HSV-1, HSV-2 and VZV in lesion swabs

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Objectives

To evaluate PCR testing with MSwab (Copan, Italia) rapid nucleic acid extraction and the RealStar® *alpha* Herpesvirus PCR Kit (Altona Diagnostics GmbH Hamburg, Germany) for diagnosing skin and mucous membrane lesions with Herpes simplex virus (HSV) types 1 and 2 and Varicella zoster virus (VZV).

Methods

Over the course of one year, 74 swabs that were direct fluorescent antibody (DFA) and/or shell vial culture positive and 61 randomly selected DFA/culture negative specimens were collected. DFA is routinely used for detection of VZV (Light Diagnostics) H and V shell vials are used to culture HSV and VZV (if DFA negative) and stained with type specific monoclonal antibodies (HSV: Diagnostic Hybrids, VZV: Light Diagnostics) For later evaluation, the Universal Transport Medium (UTM: Copan, Italia) was decanted and stored at -80^{o}C. Swabs were retained separately at -80^{o}C. The residual material trapped in the swab was processed by a rapid extraction method. Swabs were thawed and transferred to 1 mL of M-Swab medium and vortexed vigorously for 30 seconds. A 200µl aliquot was heated at 97-98^{o}C for 3 minutes, briefly vortexed and centrifuged at 14,000 rpm for 2 minutes. For easyMag (bioMérieux) extraction, 200ul of the UTM was extracted in 55ul using the generic protocol.

The Altona RealStar® *alpha* Herpesvirus PCR assay was used according to manufacturer's instructions for detection on a Rotorgene 6500 (Corbett Research/ Qiagen). Discordant PCR/DFA/Shell Vial results were resolved with repeat culture and a lab developed PCR using different targets than the Altona PCR.

Results

UTM easyMag extraction followed by PCR detected 73/74 DFA/ culture positives (98%) and a total of 76 viruses.

M-Swab boiled-rapid extraction followed by PCR detected 73/74 DFA/ culture positives (98%) and a total of 75 viruses.

Of the 61 DFA/culture negative samples, 47 were PCR negative (easyMag and MSwab), 10 were PCR positive in both methods for the same virus (5 HSV1, 4 HSV2, 1 VZ/HSV), 3 were positive by UTM/easyMag protocol and negative by M-Swab, one was positive by M-Swab and negative by UTM/easyMag. Both UTM/easyMag and M-swab detected two dual VZV/HSV2 infections.

Compared to DFA/Shell vial the PCR had a sensitivity of 99% (95% CI: 94-100), a specificity 94% (95% CI: 84-98), a positive predictive value of 97% and a negative predictive value of 98%.

Conclusions:

The Altona RealStar *alpha* Herpesvirus PCR is more sensitive and specific than DFA/Shell vial and provides same day results for HSV-1, HSV-2, and VZV.

Using a boiled-rapid extraction preparation of M-swab transported lesion specimens for PCR is a rapid

and inexpensive method of specimen processing with high agreement to easyMag extracted UTM processing.