COMPARISON of FLOCKED and RAYON SWABS for EPITHELIAL CELL YIELD from NASOPHARYNGEAL SAMPLING of PATIENTS with RESPIRATORY TRACT INFECTIONS.

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ABSTRACT

Introduction: Sensitivity of nasopharyngeal swabs (NPS) collected for viral diagnosis are affected by the number and quality of respiratory epithelial cells collected. We previously found that epithelial cell yield increased with new Micro-Rheologics flocked swabs (Copan Diagnostics, Corona, CA) compared to traditional rayon swabs in healthy volunteers. The objective of this study was to validate this observation among symptomatic patients.

Methods: We obtained a stratified sample of 61 clinical specimens collected with one of the swab types, including 20 infected with influenza A, 21 with RSV, and 20 virus-negative patients. Of the 61 NPS collected, 31 were with the new flocked swab and 30 with the conventional rayon swab. Swabs were placed in viral transport media (UTM-RT) (Copan Diagnostics, Corona, CA), vortexed, centrifuged, resuspended, placed in wells on a glass slide, dried, fixed and stained using FITC labelled monoclonal antibody to seven respiratory viruses and a negative control. Slides were read at 400X magnification, infected and uninfected respiratory epithelial cells were counted and the cell yield averaged over 4 fields. Means per high-powered field (hpf) were compared using Student’s t-test, and adjusted for etiology and pediatric origin by multivariable linear regression (SPSS).

Results: Twenty-one NPS were collected from adults, of which 15 (71.4%) were positive; 40 were collected from children, of which 26 (65.0%) were positive. Over-all, the flocked swab collected 66.1 (sd 30.1) vs. 24.6 (sd 12.4) cells/hpf, for a mean difference of 42.1 cells/hpf (95% CI: 30.2 to 53.9 cells, P<0.001). Adjusting for etiology and pediatric status, this mean difference was virtually identical (mean difference=42.2 cells, P<0.001). Among adults, the flocked swab collected significantly more cells/hpf (61.0 vs. 29.4, P<0.001), with an increase in the number of infected cells/hpf (17.6 vs. 5.9, P=0.08). Among children, the flocked swab collected more cells/hpf (69.3 vs. 21.8, P<0.001) and yielded significantly more infected cells/hpf (28.9 vs. 10.9, P=0.003).

Conclusions: The new Micro-Rheologics flocked swabs increased the yield of total and infected epithelial cells in NPS, and may be preferable to rayon for routine clinical use.

INTRODUCTION:

Sensitivity of nasopharyngeal swabs (NPS) collected for viral diagnosis are affected by the number and quality of respiratory epithelial cells collected. We previously found that epithelial cell yield increased with new Micro-Rheologics flocked swabs (Copan Diagnostics, Corona, CA) compared to traditional rayon swabs (Copan) in healthy volunteers.
RESULTS:

- Forty NPS specimens were collected from children, of which 26 (65.0%) were positive.
- Among children, the flocked swab collected more cells/hpf (69.3 vs. 21.8, P<0.001) and yielded more infected cells/hpf (28.9 vs. 10.9, P=0.003).
- Twenty-one NPS specimens were collected from adults, of which 15 (71.4%) were positive;
- Among adults, the flocked swab collected significantly more cells/hpf (61.0 vs. 29.4, P<0.001), with an estimated increase in the number of infected cells/hpf (17.6 vs. 5.9, P=0.08).
- Adjusting for etiology and pediatric status, this mean difference was virtually identical (mean difference=42.2 cells, P<0.001).
- Over-all, the flocked swab detected 66.1 (sd 30.1) vs. 24.6 (sd 12.4) cells/hpf, for a mean difference of 42.1 cells/hpf (95% CI: 30.2 to 53.9 cells, P<0.001).

CONCLUSIONS:

The new flocked swabs in the overall doubled the number of positive epithelial cells in children and adults.

The new microRheologics flocked swabs increased the yield of total and infected epithelial cells in NPS specimens, and is preferable to rayon for routine clinical diagnostic use.