

Respiratory Viral Recovery From Pediatric Nasopharyngeal Specimens Using Flocked Swabs

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Abstract

Background: The accurate diagnosis of respiratory viral infections in hospitalized pediatric patients has always been a concern for clinicians and the clinical virology laboratory staff. For the past 10-15 years, our clinical virology laboratory has used the M4 swab as the universal collecting device. We compared the newly developed Flocked nylon swabs (Copan Dx, Inc.) with the M4 rayon swabs for the detection of Flu A, Flu B and RSV by RT-PCR and DFA.

Materials & Methods: One hundred nasopharyngeal swabs (50-M4 and 50-Flocked) collected January 7 – February 27, 2008 from 50 hospitalized pediatric patients (NICU & PICU) were evaluated and compared for Flu A, Flu B & RSV by real-time PCR and DFA methods. Aliquots (400ul) of M4 & Flocked samples were extracted (EasyMag) and tested using the newly FDA-cleared ProFlu+ assay (Prodesse, Inc., WI). The remaining M4 & Flocked samples were used to prepare DFA slides. ProFlu+ is a one-step multiplex RT-PCR assay that can detect three different viruses from one sample. We performed RT-PCR using the RotorGene 3000 (Corbett Inc.) and we performed DFA using reagents from Diagnostic Hybrids (Athens, OH) per standard protocol.

Results: Twenty-two out of fifty samples (22/50 = 44%) were positive by DFA for one of the three respiratory viruses by both swabs: 18 RSV, 3 Flu A and 1 Metapneumo viruses. No differences were found with the positive rate between the two swabs. However we did observe more positive cells on few of the DFA slides from Flocked samples. 23/50 (46%) were positive by RT-PCR with a co-infection (RSV and FluB) detected on Flocked sample and missed on M4 sample.

According to our nurse practitioner and pediatricians, the Flocked swabs are much more flexible than the M4 swab, and one can get further back in the patient's nose and cause fewer trauma to the patient.

Conclusion: Both Flocked and M4 swabs yield same number of positive results. The viral recovery was comparable from the 50 pediatric patients enrolled in this study.

Since the Copan swabs are much more flexible and easy to use, we have decided to implement the Flocked swabs for the Children's Hospital at the Cleveland Clinic.

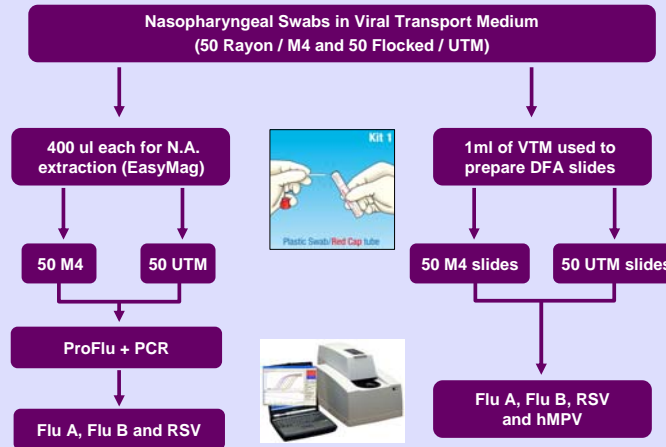
Background

The accurate diagnosis of respiratory viral infections in hospitalized pediatric patients has always been a concern for clinicians and the clinical virology laboratory staff. Our clinical virology laboratory has used the Rayon swab in M4 media as the universal collecting device. We compared the newly developed Flocked nylon swabs (Copan Dx, Inc.) with the M4 Rayon swabs for the detection of Flu A, Flu B and RSV by RT-PCR and DFA.

Materials & Methods

One hundred nasopharyngeal swabs (50-M4 and 50-Flocked) collected from 50 hospitalized pediatric patients were evaluated and compared for the detection of Flu A, Flu B and RSV by real-time PCR and DFA. Aliquots (400ul) of M4 & Flocked samples were extracted (EasyMag) and tested on the newly FDA-cleared ProFlu+ assay (Prodesse, Inc., WI).

The remaining M4 & Flocked samples were used to prepare DFA slides. ProFlu+ is a one-step multiplex RT-PCR assay that can detect 3 different viruses from one sample. We performed RT-PCR using the RotorGene 3000 (Corbett Inc.) and we performed DFA using reagents from Diagnostic Hybrids (Athens, OH) per standard protocol.



Results

22/50 (44%) were positive by DFA for one of the three respiratory viruses by both swabs: 18 RSV, 3 Flu A and 1 Metapneumo viruses. No differences were found with the positive rate between the two swabs. More positive cells were observed on a few of the DFA slides from Flocked samples. 23/50 (46%) were positive by RT-PCR with a co-infection (RSV and FluB) detected on Flocked sample and missed on M4 sample

Positive Samples

Swabs	Method	Flu A	Flu B	RSV
Flocked –UTM	DFA	3	0	18 +hMPV
	RT-PCR	3	1	20
Rayon –M4	DFA	3	0	18 - hMPV
	RT-PCR	3	0	20

Summary

- Both swabs gave positive results on 21/50 (42%) samples by DFA; Flocked swabs detected one additional hMPV that was missed by M4.
- More positive cells were observed on DFA slides from the Flocked samples.
- Results were positive on 23/50 (46%) samples by RT-PCR; Flocked swab detected one co-infection (FluB+ RSV) which was missed by M4 swab.

Conclusions

- Results from this study showed that both Flocked and Rayon swabs performed equally well for respiratory viral detection.
- No inhibition was found in the RT-PCR assays with either Flocked or Rayon swabs.
- According to our nurse practitioner and pediatricians, the Flocked swabs are much more flexible than the M4 swabs, and one can get further back in the patient's nose and cause less trauma to the patient.

Acknowledgements

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