AMERICAN SOCIETY FOR MICROBIOLOGY | Journal of Clinical Microbiology®

LETTER TO THE EDITOR

Combined Self-Collected Anterior Nasal and Oropharyngeal Specimens versus Provider-Collected Nasopharyngeal Swabs for the Detection of SARS-CoV-2

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KEYWORDS COVID-19, SARS-CoV-2, alternative specimen, combined oropharngeal and nasal, self-collected swabs

The U.S. Food and Drug Administration (FDA) and Centers for Disease Control interim guidelines for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) testing list the patient self-collected anterior nares swab (ANS) as an acceptable alternative to the standard health care provider (HCP)-collected nasopharyngeal swab (NPS) (1, 2). Self-collected ANS minimizes HCP exposure to infectious aerosols, thus reducing the need for high-level personal protective equipment. Self-collection using ANS may also be more comfortable for the patient. However, published reports have observed variable ANS sensitivities compared to NPS (3–5). We previously observed that self-collected ANS missed 15% of positive detections compared to NPS or saliva (6) and hypothesized that self-collected swabs from multiple anatomic sites may improve diagnostic sensitivity.

We performed a prospective study of self-collected oropharyngeal swab (OPS) combined with self-collected ANS versus HCP-collected NPS. After providing informed consent, adult patients presenting to a drive-through test center with symptoms suggestive of COVID-19 were instructed first to swab their throat with one swab and then to swab both anterior nares with a second swab. The HCP-collected NPS was obtained last. The oropharyngeal and anterior nares swabs were placed in a single tube with 3 ml sterile 1× phosphate-buffered saline (PBS). Either foam swabs or spun swabs were used for the combined collections. A flocked swab placed in 3 ml 1× PBS was used for NPS sampling. Specimens were tested by any one of several FDA Emergency Use Authorization (EUA) nucleic acid amplification tests (NAAT) currently in use in our laboratory, including the cobas SARS-CoV-2 (Roche) assay, Panther Fusion SARS-CoV-2 (Hologic) assay, or the Aptima SARS-CoV-2 (Hologic) assay.

Paired samples were collected from 423 unique patients. Overall, there was 98.8% qualitative agreement (95% confidence interval [CI], 97.26 to 99.61; Kappa = 0.97) observed between the dual OPS-ANS and NPS collections (Table 1). Percent positivity appeared slightly higher for NPS (27.7%; 117/422) than for the dual collections (27.0%; 114/422), but this difference did not reach statistical significance (chi-square test $P = 0.88$). Results corresponding to the swab types used for OPS-ANS collections are shown in Table 1. In all, 78.6% (332/423) of OPS-ANS collections were spun swabs and 21.3% (90/423) were foam swabs. There were 4 patients (0.95%) positive for SARS-CoV-2 by NPS only. In addition, a single patient was positive by OPS-ANS spun swab alone. Paired OPS-ANS and NPS samples with residual volume were retested with the Panther

Citation Shakir SM, Barker AP, Hillyard DR, Gilmore N, Barrett JW, Orlandi RR, Hanson KE. 2021. Combined self-collected anterior nasal and oropharyngeal specimens versus provider-collected nasopharyngeal swabs for the detection of SARS-CoV-2. J Clin Microbiol 59:e02291-20. https://doi.org/10.1128/JCM.02291-20.

Editor Angela M. Caliendo, Rhode Island Hospital

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Accepted manuscript posted online 21 October 2020
Published 17 December 2020

TABLE 1 SARS-CoV-2 nucleic acid detection results for paired nasopharyngeal swabs and combined oropharyngeal swabs and anterior nasal swabs in 422 patient samples[a]

Swab category	Result	No. of NPS			% positive agreement (95% CI)	% negative agreement (95% CI)
		Positive	Negative	Total		
All OPS-ANS	Positive	113	1	114		
	Negative	4	304	308	96.60 (91.48–99.06)	99.67 (98.19–99.99)
	Total	117	305	422		
Spun OPS-ANS	Positive	83	1	84		
	Negative	4	244	248	95.40 (88.64–98.73)	99.60 (97.75–99.99)
	Total	87	245	332		
Foam OPS-ANS	Positive	30	0	30		
	Negative	0	60	60	100 (88.43–100)	100 (94.04–100)
	Total	30	60	90		

[a]Abbreviations: 95% CI, 95% confidence interval; ANS, anterior nares swabs; NPS, nasopharyngeal swabs; OPS, oropharyngeal swabs.

Fusion SARS-CoV-2 assay for resolution of discrepancies. Samples with initial "detected" results repeated as low positives with threshold cycle (C_T) values of >34 (data not shown).

In conclusion, self-collected patient OPS and ANS use is logistically feasible and analytically equivalent to HCP-collected NPS use for the detection of SARS-CoV-2. Our results correlate with published observations from other groups (7, 8). A multisite collection strategy, however, depends on the availability of swab supplies. We did not assess using a single swab for the OPS-ANS dual collection, which could be considered if swab supplies are expected to be limiting. Potential explanations for observed discrepancies include inadequate collection technique, use of nonflocked swabs for the OPS-ANS collection, and/or low virus loads near the limit of detection of the respective EUA assays. An imbalance in the numbers of spun versus foam swabs also precluded conducting an adequate comparison of swab types. Despite these limitations, combined OPS-ANS samples represent a useful and practical approach for SARS-CoV-2 testing.

ACKNOWLEDGMENT

We thank the ARUP Institute for Clinical and Experimental Pathology for their support.

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