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Evaluation of the concordance in COVID-19 diagnosis between Nasopharyngeal and Oropharyngeal swabs

Michel Carlos Tommo Tchouaket, Joseph Fokam, Ezéchiel Ngoufack Jagni Semengue, Yagai Bouba, Collins Ambe Chenwi, Alex Durand Nka, Désiré Takou, Samuel martin Sosso, Grace Angong Beloumou, Aude christelle Ka'e, Aurelie Minelle Kengni Nguoko, Nadine Fainguem, Laeticia Grace Yatchou Heunko, Sandrine Claire Djupsa Ndjeyep, Willy Leroi Togna Pabo, Davy-Hyacinthe Gouissi Anguechia, Naomi-Karell Etame, Evariste Molimbou, Rachel Audrey Nayang Mundo, Aissatou Abba, Samuel Martin Sosso, Vittorio Colizzi, Carlo-Federico Perno, Alexis Ndjolo

Background: nasopharyngeal (NASO) specimen collection causes patient discomfort, which may discourage sampling for COVID-19 testing and limit case detection. This calls for alternative and more comfortable sampling. We thus evaluate the concordance between nasopharyngeal and oropharyngeal (ORO) sampling for the COVID-19 diagnosis in the Cameroonian context.

Methods: A comparative study was conducted in April 2021 among consenting participants tested for COVID-19 at Chantal BIYA International Reference Centre (CIRCB) in Yaoundé-Cameroon. Nasopharyngeal and oropharyngeal swabs were collected and analysed in parallel by PCR using Abbott Real Time for SARS-CoV-2. Statistical analyses were performed using Graph Pad version 6.0; P values <0.05 were considered statistically significant.

RESULTS: A total of 154 participants were enrolled, 92 men and 62 women, median age [IQR] 38 [30-49] years. After PCR testing, the overall COVID-19 positivity rate was 36.36% (56/154); with 34.41% (53/154) in nasopharyngeal versus 16.23% (25/154) in oropharyngeal samples, $p < 0.0002$. The overall concordance rate was 78%, with 39.28% positive concordance and 74.24% negative concordance. According to SARS-CoV-2 viremia, the positive concordance was stronger with high viremia ($CT \leq 25$): 61% (11/18) versus 31% (11/35) low viremia ($CT > 25$), $p = 0.037$; $OR = 3.43$. According to gender, the positive concordance was stronger in men 55% (16/29) versus 25% (6/24) in women, $p = 0.021$; $OR = 0.27$. Regarding clinical symptoms, the positive concordance was 40% (2/5) in symptomatic versus 42% (20/48) in asymptomatic participants, $p = 0.94$. Using NASO as gold standard, the sensitivity of ORO test was 41.50% (22/53), specificity 97.02% (98/101); PPV 88% (22/25), and NPV 76% (98/129).

Conclusion: These results suggest that, though oropharyngeal specimens may not represent a perfect alternative to nasopharyngeal specimens for SARS-CoV-2, its performance becomes more efficient at high-level viremia (super-propagators). Thus, ORO swabs might be proposed to patients with counter-indication to nasopharyngeal sampling.