

## البحث السابع:

عنوان البحث باللغة الانجليزية:

**Comparable detection of nasopharyngeal swabs and induced sputum specimens for viral nucleic acid detection of suspected novel coronavirus (SARS-Cov-2) patients in Fayoum governorate, Egypt**

### Abstract:

**Background** The most commonly utilized samples for severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2) detection using real-time quantitative reverse transcriptase-polymerase chain reaction (RT-qPCR) are nasopharyngeal swabs (NPS) and oropharyngeal swabs. However, there are some drawbacks. For SARS-CoV-2 detection, induced sputum might be analyzed and may be equivalent to pharyngeal swabs. This study was done to assess the potential superiority of induced sputum over NPS for SARS-CoV-2 detection. Sixty symptomatic COVID-19 patients who attended Fayoum University Hospitals in Fayoum Governorate, Egypt, were included in this cross-sectional descriptive study. Paired NPS and induced sputum samples were collected from each subject on the third and tenth days after symptoms began for RT-qPCR SARS-COV2 diagnosis.

**Results** At day 3, 52 (86.7%) of NPS and 48 (80.00%) of induced sputum specimens had positive RT-qPCR results with a significant statistical difference ( $P = 0.001$ ). At day 10, 41 induced sputum samples (68.3%) were negative, while 19 (31.7%) were positive. Only three (5.0%) of the 19 positive induced sputum samples tested positive for NPS. NPS samples had a higher viral load than induced sputum samples at day 3 [25 (41.7%) vs. 23 (38.3%)]. At day 10, induced sputum samples had a higher viral load than NPS [9 (15.0%) vs. 6 (10.0%)]. A statistically significant positive correlation between the viral load value of the NPS and the induced sputum sample at day 3 ( $r = 0.497$ ,  $p = 0.00$ ) denoting similarity in the results of the two types of samples. By ROC analysis, the highest area under the curve for the overall CT value of the induced sputum was (0.604), with a statistically significant difference ( $p$  value = 0.0418).

**Conclusion** In the early stages of the disease, induced sputum and NPS tests had comparable results, but NPS yielded more false negative results later in the disease course than an induced sputum sample, which yielded higher sample positivity and viral load than NPS. Furthermore,

induced sputum collection is a straightforward, non-invasive, and risk-free method. As a result, induced sputum could be useful for COVID-19 confirmation in patients with radiologically or epidemiologically suspected COVID-19 who have a negative NPS or in difficult-to-diagnose COVID-19 patients.