



**ORIGINAL RESEARCH PAPER**

**ENT**

**CHARACTERIZATION AND ANALYSIS OF PATIENT UNDER GOING COVID 19 RTPCR AT TERTIARY CARE CENTER**

**KEY WORDS:** RT-PCR TESTING, COMPLICATION.

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**ABSTRACT**

**INTRODUCTION** RT-PCR testing (Reverse transcriptase polymerase chain reaction) is most reliable diagnostic procedure for covid 19 screening. In the absence of effective treatments or preventive measures, all attempts to control the pandemic were based on RT-PCR testing of upper respiratory specimens, which is considered the diagnostic gold standard [1] RT-PCR COVID-19 testing is a generally safe and well-tolerated procedure, but numerous complications have been reported during this procedure. **MATERIAL AND METHOD** Retrospective study of 1524 Patients for RT-PCR testing were carried out from 1st February 2021 to 30th June 2021 and complications of testing were studied. **RESULT** Most common complication was broken swab in nasal cavity seen in 0.33% individuals. Second most common complication was epistaxis seen in 0.26% individuals. Least common complications were fainting and foreign body in throat seen in 0.13% and 0.07% of individuals respectively. Complications like CSF leak, septal abscess and pharyngeal abscess were not seen. **CONCLUSION** Our study reviewed the complications during COVID 19 RT-PCR testing. Sufficient anatomical and clinical knowledge of nasopharyngeal anatomical structures are required to lower the incidence of adverse events and also to protect patients from preventable but often underestimated risks.

**INTRODUCTION:**

The coronavirus disease 2019 (COVID-19) pandemic comprises approximately 50 million confirmed cases and over 1.2 million deaths as of 10 November, 2020 [1] affecting healthcare systems worldwide in an unprecedented way. To prevent rapid human to human transmission and lack of specific therapy, fast and reliable diagnostic test are essential. Widespread vaccination against SARS-CoV-2 will take some time, so keeping this disease transmission under control is high priority, and there is a need of effective testing to prevent transmission of disease. Diagnostic techniques based on viral RNA amplification, specifically qRT-PCR (quantitative real-time polymerase chain reaction), are the gold standard diagnostic test for COVID - 19.[2],[3] Nasopharyngeal and oropharyngeal swabs have been widely used to perform RT-PCR testing to prevent the spread of coronavirus disease (COVID-19). Nasopharyngeal and oropharyngeal swab COVID-19 testing is a generally safe and well-tolerated procedure, but numerous complications have been reported in this procedure.[4],[5],[6] Surgical intervention were required in 25% of reported complications and other were managed by medical intervention in our study.

**MATERIAL AND METHOD**

Retrospective study of 1524 suspected covid 19 cases was carried out in tertiary care center, ahmedabad for a period of 5 month (1st February to 30th June). Patients undergoing RT-PCR testing was conducted by ENT department were included as study population. Subjects enrolled in our characterization and analysis study were symptomatic, pregnant woman, traveller, pre-operative, samples collected from OPD, ICU, contact with covid 19 positive patient etc. Those who have no contact history and those who had exceeded 14 days after covid 19 infection were excluded from this study. Testing criteria covered epidemiological and / or clinical indications like presence of symptoms, contact history, etc). All included cases were tested with RTPCR and covid 19 was diagnosed based on WHO interim guidance.

**RESULT**

We had taken 1524 total COVID 19 swabs for RT-PCR testing. Among those 695 were females and 829 were males. From 829 males - 767,56,6 were Hindu, Muslim and Christian respectively. And from 695 females - 629,63,3 were Hindu, Muslim, and Christian respectively. RT-PCR testing result of 1524 samples was negative for 1314 patients and positive for 210 patients. In those 210 swabs 173 patient had not taken vaccine while 37 had taken vaccine. From 1524 patients only 12 patients had complication during RT-PCR testing. Rate of complications of RT-PCR testing in our study is 0.79%. From 0.79% the proportion of broken swab, epistaxis, fainting, and foreign body in throat were 0.33%, 0.26%, 0.13%, 0.07% respectively. None of these 12 patients were found covid 19 positive in this study. Among the 4 cases of epistaxis 2 patients required anterior nasal packing, 1 required cautery via endoscopic approach and 1 was treated conservatively. A patient of foreign body in throat was removed under GA. One broken swab was removed via endoscopically and 2 patients having fainting episode treated conservatively. In this study highest proportion of patients tested for RT-PCR were from hospitalisation category which was 28.54%, rest were 72.46% from other categories.

**DISCUSSION**

considering the millions of transnasal testing performed for SARS-CoV-2, the procedure must be relatively safe. The literature does suggest that nasopharyngeal swabs are at increased risk of complications compared with other types of swabs. The most common complication of epistaxis is due to the fragile nature of the nasal mucosa combined with its rich vascular supply originating from branches of the internal and external carotid arteries.[7] The majority of resulting epistaxis are mild and resolve without intervention.[3] When encountering epistaxis, the patients should be instructed to tilt their head forward to avoid blood ingestion or aspiration and then to apply continuous, firm pressure to the lower third of the external nose for 15 minutes.[8],[9] If bleeding persists, the patient should be transferred to the nearest emergency room and via endoscopic approach cauterization should be done to stop bleeding from nose. Swabs have an inherent

breakpoint mechanism to aid in easy transfer to the transport vial. However, this breakpoint is vulnerable to accidental fragmentation during sample collection, especially in uncooperative patients or sedated patients upon whom undue force is applied.[10] Furthermore, when not inserted along the nasal floor axis, the swab may contact structures that can increase the risk of fracturing swab stick near septal spurs, inferior and middle turbinates. Retrieval was generally performed with or without local anesthesia under direct visualization with direct rhinoscopy or nasal endoscopy. However, if the fragmented swab is not visualized, patients must be carefully monitored for foreign body ingestion or aspiration. One reported case in our study was ingestion of swab stick during procedure which was removed under general anaesthesia via esophagoscopy. New approaches to the detection of SARS-CoV-2 are being developed with testing specimen including saliva, blood, urine and feces.[11],[12] Saliva testing demonstrates diagnostic accuracy similar to that of nasopharyngeal swab.[13] Saliva testing advantages include ease of sample procurement, increased patient comfort, greater safety and reduced exposure risk for personnel collecting samples. [12],[14]

**CONCLUSION**

Timely and reliable testing is important in controlling the COVID 19 pandemic. Nasopharyngeal swab RT-PCR testing is often used as the main diagnostic test method because it yields early results with moderate sensitivity and excellent specificity.[14]The frequency of complication was extremely low in this study. All complications seemed to involve an incorrect sampling technique which was Excessive use of force or an overly cranial direction of the swab. While the patients who experienced broken swabs fared well. Proper technique and trained staff will prevent life endangering complication of RT-PCR sampling.

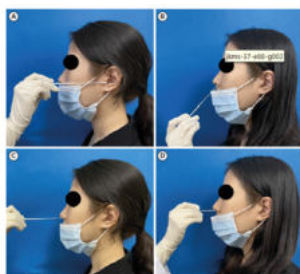
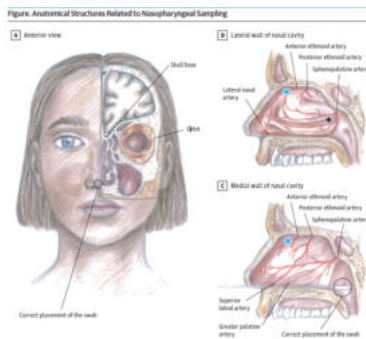
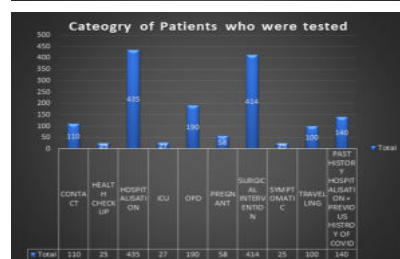
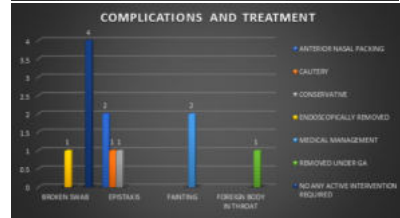
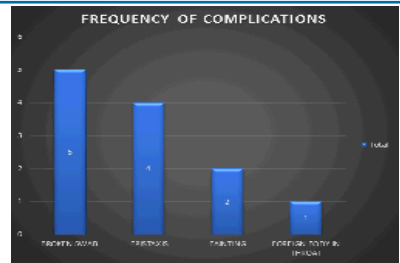


Fig. 2: The ideal procedural steps to obtain a nasopharyngeal swab specimen for coronavirus disease (COVID) testing. (A) Before testing, the operator can perform the depth of insertion by measuring the longest distance the swab stick fits anteriorly into canal. (B) Insert the swab stick into the nostril and rotate it 30 degrees in the nasal passage until reaching the anterior nasal wall. (C) During the insertion, rotate the swab stick 90 degrees clockwise until the swab stick is parallel to the nasal wall. (D) Withdraw the swab along the nasal wall until reaching the anterior nasal wall. (E) Rotate the swab stick 90 degrees clockwise to align on the posterior wall for several seconds and gently withdraw the swab until reaching the anterior region. (F) Rotate the swab stick 90 degrees clockwise to avoid excessive insertion. (The pictures were demonstrated by the authors. Mean 20 and 17-year-old women for publication.)



**REFERENCES**

- World Health Organization. Coronavirus Disease (COVID-19) Weekly Epidemiological Update November 10, 2020. www.who.int/docs/default-source/coronaviruse/situation-reports/20201110-weekly-epi-update-13.pdf?sfvrsn=24435477\_15&download=true Date last accessed: 11 Nov 2020.
- E. Surkova, V. Nikolayevskyy, F. Drobniowski, False-positive COVID-19 results: hidden problems and costs, Lancet Respir. Med. 8 (2020) 1167–1168.
- K.H. Hong, S.W. Lee, T.S. Kim, H.J. Huh, J. Lee, S.Y. Kim, J.-S. Park, C.J. Kim, H. Sung, K.H. Roh, Guidelines for laboratory diagnosis of coronavirus disease 2019 (COVID-19) in Korea, Ann. Lab. Med. 40 (2020) 351–360.
- Clark JH, Pang S, Naclerio RM, Kashima M. Complications of nasal SARS-CoV-2 testing: a review. J Investing Med. 2021 Dec;69(8):1399-1403. doi: 10.1136/jim-2021-001962. Epub 2021 Aug 4. PMID: 34348963.
- Agamawi YM, Namin A, Ducic Y. Cerebrospinal Fluid Leak From COVID-19 Swab. OTO Open. 2021 Nov 15;5(4):2473974X211059104. doi: 10.1177/2473974X211059104. PMID: 34805722; PMCID: PMC8600556.
- Hakimi AA, Goshtasbi K, Kuan EC. Complications Associated With Nasopharyngeal COVID-19 Testing: An Analysis of the MAUDE Database and Literature Review. Am J Rhinol Allergy. 2022 Mar;36(2):281-284. doi: 10.1177/19458924211046725. Epub 2021 Sep 21. PMID: 34547903; PMCID: PMC8808139.
- A. Tahamtan, A. Ardebili, Real-time RT-PCR in COVID-19 Detection: Issues Affecting the Results, Taylor & Francis, 2020
- Y.W.Tang, J.E.Schmitz, D.H.Persing, C.W.Stratton, The laboratory diagnosis of COVID-19 infection: current issues and challenges, J. Clin. Microbiol. 10 (2020) 00512–00520.
- P. Wang, Combination of serological total antibody and RT-PCR test for detection of SARS-COV-2 infections, J. Virol. Methods 283 (2020), 113919.
- Föh B, Borsche M, Balck A, et al. Complications of nasal and pharyngeal swabs – a relevant challenge of the COVID-19 pandemic? Eur Respir J 2020. Online ahead of print. Doi:10.1183/13993003.04004-2020.
- S. Deka, D. Kalita, Effectiveness of sample pooling strategies for SARS-CoV-2 mass screening by RT-PCR: a scoping review, J. Lab. Physicians 12 (2020) 212.
- A. Premraj, A. G. Aleyas, B. Nautiyal, T.J. Rasool, Nucleic acid and immunological diagnostics for SARS-CoV-2: processes, platforms and pitfalls, Diagnostics 10 (2020) 866.
- M. Espy, J. Uhl, L. Sloan, S. Buckwalter, M. Jones, E. Vetter, J. Yao, N. Wengenack, J. Rosenblatt, F. Cockerill, Real-time PCR in clinical microbiology: applications for routine laboratory testing, Clin. Microbiol. Rev. 19 (2006) 165–256.
- Green DA, Zucker J, Westblade LF, Whittier S, Rennert H, Velu P, Craney A, Cushing M, Liu D, Sobieszczyk ME, Boehme AK, Sepulveda JL. Clinical Performance of SARS-CoV-2 Molecular Tests. J Clin Microbiol. 2020 Jul 23;58(8):e00995-20. doi: 10.1128/JCM.00995-20. PMID: 32513858; PMCID: PMC7383556.