Editorial

Oral squamous cell carcinoma, a potential risk factor for SARS-CoV-2 infection and COVID-19 associated complications

Thodur Madapusi Balaji1, Saranya Varadarajan2, Shankargouda Patil3, A Thirumal Raj2,*

1 Dept. of Dentistry, Bharathirajaa Hospital, and Research Institute, Chennai, Tamil Nadu, India
2 Dept. of Oral Pathology and Microbiology, Sri Venkateswara Dental College and Hospital, Chennai, Tamil Nadu, India
3 Dept. of Maxillofacial Surgery and Diagnostic Sciences, Division of Oral Pathology, College of Dentistry, Jazan University, Jazan, Saudi Arabia

© This is an open access article distributed under the terms of the Creative Commons Attribution License (https://creativecommons.org/licenses/by/4.0/) which permits unrestricted use, distribution, and reproduction in any medium, provided the original author and source are credited.

The recent outbreak of the COVID 19 pandemic has caused untold anxiety and a threat to human life. It is caused by the SARS-CoV-2 Virus belonging to the coronaviridae family.1 The disease spreads by droplet transmission from person to person. As at present there are no specific drug or vaccine available, social distancing along with good hygiene practices are the need of the hour to prevent the disease spread. It has been reported that the prognosis of the disease is poor in the case of associated comorbidity such as diabetes,2 hypertension,3 and malignancy.4

Oral squamous cell carcinoma (OSCC) is ranked as the 6th most common malignant worldwide.5 Although the disease is multifactorial in etiology, tobacco and alcohol have been proposed as the major risk factors.6 It is a well-known fact that several molecular pathways are altered in oral carcinogenesis causing overexpression of various proteins such as EMMPRIN,7 TMPRSS,8 Furin,9 and Cathepsin L.10 It has been hypothesized that these molecules could facilitate SARS Cov-2 entry into the host.11 Hence oral squamous cell carcinoma could be considered a predisposing factor for SARS Cov-2 infections. In addition to the plethora of molecules overexpressed in OSCC/oral cancer, the role of inflammasomes in the pathobiology and progression of oral cancer deserve mention at this juncture. Danger signals of endogenous origins elicit an immune response in form of inflammasomes, which are a large complex of multiple proteins capable of signaling. These inflammasomes are located in the cell’s cytosol and are capable of caspase-1 (inflammatory protease) upregulation. They can also cleave the interleukin (IL)-1β and pro-IL-18 (pro-inflammatory cytokines) to their respective active forms, thereby initiating pyroptosis.12 Nod-like receptor (NLR), the adapter apoptosis-associated speck-like (ASC) protein, and Caspase-1 constitute the inflammasome complex. Nod-like receptor protein 3 (NLRP3), is an NLR protein family member and is in turn comprised of 22 members.13,14 NLRP3 responds to several infectious and endogenous ligands. Thus, NLRP3 dysregulation is a vital part of the molecular biology of numerous pathologies both inflammatory and tumorigenic nature. Inflammation is a strength linked to genetic and epigenetic changes capable of inducing OSCC.15 Upregulated NLRP3 inflammasome has been reported in both animal OSCC model and human OSCC cases. Hence it is anticipated that patients with OSCC could have higher levels of circulating pro-inflammatory cytokines such as IL 1 beta and IL 6 as a consequence of NLRP3 activation. Further evidence for the

*A Corresponding author.
E-mail addresses: thirumalraj666@gmail.com (A. T. Raj).
same is obtained from clinical studies that have assessed circulating proinflammatory cytokines in OSCC patients. It is also noteworthy that the NLRP3 inflammasome is activated in SARS-Cov 2 infection. In sequela of SARS-Cov 2 infection such as acute respiratory distress syndrome and acute lung injury, NLRP3 activation has been implicated as a major source of aberrant cytokine production which finally culminates in multi-organ injury and morbidity. It has been postulated that the injury of cells bearing the Angiotensin-converting enzyme 2 (ACE 2) leads to dysregulated NLRP3 activation. Interestingly, the ACE 2 enzyme is a receptor for binding and entry of SARS Cov 2 into the human host. In this scenario, it could be hypothesized that a patient having OSCC and SARS Cov 2 will have very high levels of circulating cytokines and is hence vulnerable to multi-organ failure. It is hence suggested that patients with OSCC should be utmost careful considering the vital mechanism mediated through furin and cathepsin overexpression. Oral cancer and periodontal disease increase the risk of COVID 19? A mechanism mediated through furin and cathepsin overexpression. Med Hypotheses. 2020;144:109936. doi:10.1016/j.mehy.2020.109936.

1. Conflict of Interest

None.

References


Author biography

Thodur Madapusi Balaji, Senior Consultant and Head

Saranya Varadarajan, Senior Lecturer

Shankargouda Patil, Associate Professor

A Thirumal Raj, Senior Lecturer