



Periodontal Disease and COVID 19

S. Siddharthan¹, Nyi Nyi Naing^{1*} and Nadiah Wan-Arfah²

¹*Faculty of Medicine, UniSZA, Kuala Terengganu, Terengganu, Malaysia.*

²*Faculty of Health Sciences, UniSZA, Kuala Terengganu, Terengganu, Malaysia.*

Authors' contributions

This work was carried out in collaboration among all authors. Authors SS and NNN designed the study, wrote the protocol and wrote the first draft of the manuscript. Author NWA managed the literature searches. All authors read and approved the final manuscript.

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ABSTRACT

The aim of this study is to assess the association of periodontal disease and COVID 19. Coronavirus have been announced pandemic along the globe by the WHO, which have severely affected every countries healthcare framework and health care professionals globally. Due to this pandemic every individual facing severe problems both economically and emotionally. The similarity seen on inflammatory response pathway shows there is a potential relationship between COVID-19 and Periodontitis are related. Considering the relationship, significant importance should be given to maintain periodontal health, maintaining careful and good oral hygiene in the COVID-19 situation. There is also chance of feasibility that periodontal disease can be susceptible for an individual's COVID-19 unfavourable outcomes. This relationship shows the interrelation among periodontal disease and COVID-19 and between the cytokine relationship which advices in improving hygiene in oral cavity during this COVID situation. And it is found individuals with periodontal disease have high risk of getting COVID associated unfavourable consequences.

Keywords: COVID 19; periodontal disease; oral health; general health; public health.

*Corresponding author: E-mail: syedhatim@unisza.edu.my;

1. INTRODUCTION

The novel coronavirus disease is a condition which is due to severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2), which is been transmitted through one person to another through direct or indirect contact [1]. Coronavirus have been announced pandemic along the globe by the WHO, which have severely affected every countries healthcare framework and health care professionals globally. Due to this pandemic every individual facing severe problems both economically and emotionally [2]. Periodontitis is one of the most common oral health diseases, which is caused due to different etiological factors. Pathogens containing bacteria plays a major role in developing periodontitis [3]. Based on study by Slots in the year 2010, there are viruses also been found in periodontal pockets. Hence, periodontal pockets also acts as pool for different pathogens [4].

Periodontal disease can be said as oral disease pandemic, which is being unspoken for years, which has complicated various factor that influence its pathophysiology by immune mediated pathogenesis. Periodontitis pathophysiology establish response of cytokine. Study about by Wu and his colleagues in the year 2020 about COVID-19 found that there is an association of unfavourable consequence which initiate the cytokine storm, were various elements are close enough with cytokine profile of periodontitis. Chemokines comprises of cytokines that have chemotactic nature that leads to incorporate inflammation cells. Individuals who possess elevated manifestation and needs admission in ICU, show inclined levels of Interleukin -2, Interleukin-7, Interleukin-10, Inducible Protein-10, Granulocyte-Colony Stimulating Factor, Macrophage Inflammatory Proteins-1 A, Monocyte Chemoattractant Protein-1 and Tumour Necrosis Factor alpha. Inclined sequence of Th17 reaction also seen among individuals who have SARS-CoV and MERS-CoV [5].

T helper 17 cells inflammatory response is seen in the cytokine storm and unfavourable results in pulmonary oedema and damages the tissue that leads to infection of lung caused by SARS-CoV-2. This relationship shows the interrelation among periodontal disease and COVID-19 and between the cytokine relation, to structure which advices in improving hygiene in oral cavity during

this COVID situation. And it is found individuals with periodontal disease have high risk of getting COVID associated unfavourable consequences [6].

It is been found that elevated IL-17 generating cells in tissues of gingiva among individuals who have gingivitis and periodontitis, when compared with healthy individuals. In addition, higher levels of IL-17 are seen in the serum of an individual who is having periodontal disease [7]. This support the reality that higher levels of cytokines which are found in tissue of gingiva which is inflamed replicates the level of cytokine in the systemic transmission. Proofs have been found in various studies that non-surgical treatment of periodontal disease result in declination of IL-17 levels on Gingival clavicular fluid and serum among individuals who have periodontal disease [8]. The similarity seen on inflammatory response pathway shows there is a potential relationship between COVID-19 and Periodontitis related. Considering the relationship, significant importance should be given to maintain periodontal health and maintain the value of maintaining careful and good oral hygiene in the COVID-19 situation. There is also chance of feasibility that periodontal disease can be susceptible for an individual's COVID-19 unfavourable outcomes [6].

2. METHODS

Search engines like PubMed, Medline, Web of Science, Science Direct, Scopus, Wiley Online Library, Google Scholar were used for reviewing literature and to get the information regarding the research. The various information and ideas have been identified and modified based on this research to make it authentic one.

3. EFFECT OF PERIODONTAL HEALTH ON COVID 19

Oral cavity is important pool for all respiratory pathogens, that includes Chlamydia pneumoniae; and individuals who have periodontal disease have high chance of developing hospital-acquired pneumonia [9]. Different mechanisms have explained the capability of pathogens present in oral cavity, aggravate infection in lungs. Which includes aspiration of pathogens present in oral cavity towards the lower respiratory tract, more commonly among the high risk persons;

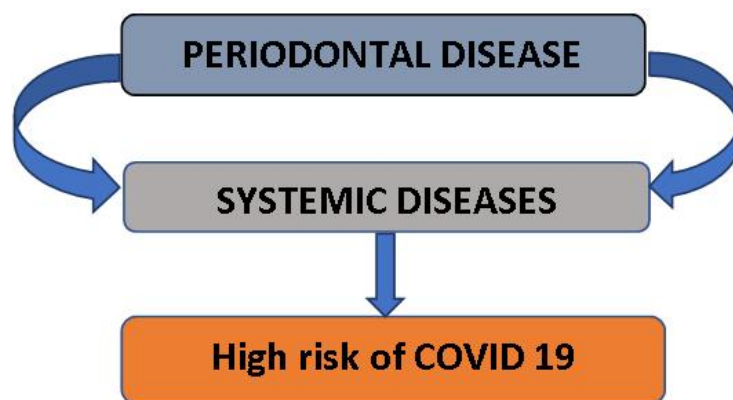


Fig. 1. Overview of periodontal disease and Covid-19

Alteration of surface along the mucosa of respiratory tract through salivary enzymes, that leads to the pathogen colonization, and release of pro-inflammatory cytokines throughout periodontitis condition, that further encourages attachment to the epithelium of lung and respiratory pathogens colonization [10]. Enhancing the oral hygiene helps to declination of colonization along oropharyngeal region and reduces the complication of respiratory system. It has been observed that better hygiene on oral cavity and good care of oral health leads to declination on development of respiratory illness, which is more significantly in the older individuals and the patients admitted in ICU [11], as these individuals are more susceptible for getting serious complexities that are associated to COVID-19 [12]. Aged individuals and person of any age who is experiencing severe medical conditions like heart conditions, diabetes, chronic lung disease or renal disease are at excessive risk of getting serious disorder because of SARS-CoV-2 condition. Nevertheless, substandard oral health status inclines the possibility of expanding the medical conditions like COVID 19. Consequently, enhancing the oral health status of individuals of any age group, by declining their possibility of getting any non-oral systemic conditions, would lower the rate of spread of COVID-19. Despite the relationship among oral health and seriousness of COVID-19 manifestation looks logical, and still further research is necessary to reveal the relationship vastly [13]. It is been found that Periodontal illness influence to a critical condition if the individual has other comorbidities [14]. It is suggested that there is a need of study to enquire the co-infection conditions among individuals who are affected with COVID-19 [15].

4. CONCLUSION

Based on various studies it seems evident that periodontal health have an indirect effect on COVID 19. Good oral health of an individual helps to reduce the possibility of getting systemic diseases, which have a chance of COVID 19 morbidity. Maintaining proper oral hygiene reduces possibility of getting periodontal disease which helps to maintain proper oral hygiene which have the positive impact on general health. However, further clinical studies required on this topic to have a widespread knowledge.

CONSENT

It is not applicable.

ETHICAL APPROVAL

It is not applicable.

COMPETING INTERESTS

Authors have declared that no competing interests exist.

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