

Study of the Association between Salivary Microbiological Data, Oral Health Indicators, Behavioral Factors, and Social Determinants among Post-COVID Patients Aged 7 to 12 Years in Tbilisi City

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Abstract : Background: The coronavirus disease COVID-19 has become the cause of a global health crisis during the current pandemic. This study aims to fill the paucity of epidemiological studies on the impact of COVID-19 on the oral health of pediatric populations. Methods: It was conducted an observational, cross-sectional study in Georgia, in Tbilisi (capital of Georgia), among 7 to 12-year-old PCR or rapid test-confirmed post-Covid populations in all districts of Tbilisi (10 districts in total). 332 beneficiaries who were infected with Covid within one year were included in the study. The population was selected in schools of Tbilisi according to the principle of cluster selection. A simple random selection took place in the selected clusters. According to this principle, an equal number of beneficiaries were selected in all districts of Tbilisi. By July 1, 2022, according to National Center for Disease Control and Public Health data (NCDC.Ge), the number of test-confirmed cases in the population aged 0-18 in Tbilisi was 115137 children (17.7% of all confirmed cases). The number of patients to be examined was determined by the sample size. Oral screening, microbiological examination of saliva, and administration of oral health questionnaires to guardians were performed. Statistical processing of data was done with SPSS-23. Risk factors were estimated by odds ratio and logistic regression with 95% confidence interval. Results: Statistically reliable differences between the averages of oral health indicators in asymptomatic and symptomatic covid-infected groups are: for caries intensity (DMF+def) $t=4.468$ and $p=0.000$, for modified gingival index (MGI) $t=3.048$, $p=0.002$, for simplified oral hygiene index (S-OHI) $t=4.853$; $p=0.000$. Symptomatic covid-infection has a reliable effect on the oral microbiome (Staphylococcus aureus, Candida albicans, Pseudomonas aeruginosa, Streptococcus pneumoniae, Staphylococcus epidermalis); ($n=332$; 77.3% vs $n=332$; 58.0%; OR=2.46, 95%CI: 1.318-4.617). According to the logistic regression, it was found that the severity of the covid infection has a significant effect on the frequency of pathogenic and conditionally pathogenic bacteria in the oral cavity $B=0.903$ AOR=2.467 (CL 1.318-4.617). Symptomatic covid-infection affects oral health indicators, regardless of the presence of other risk factors, such as parental employment status, tooth brushing behaviors, carbohydrate meal, fruit consumption. ($p<0.05$). Conclusion: Risk factors (parental employment status, tooth brushing behaviors, carbohydrate consumption) were associated with poorer oral health status in a post-Covid population of 7- to 12-year-old children. However, such a risk factor as symptomatic ongoing covid-infection affected the oral microbiome in terms of the abundant growth of pathogenic and conditionally pathogenic bacteria (Staphylococcus aureus, Candida albicans, Pseudomonas aeruginosa, Streptococcus pneumoniae, Staphylococcus epidermalis) and further worsened oral health indicators. Thus, a close association was established between symptomatic covid-infection and microbiome changes in the post-covid period; also - between the variables of oral health indicators and the symptomatic course of covid-infection.

Keywords : oral microbiome, COVID-19, population based research, oral health indicators

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