Ethnicity, COVID Severity & Periodontal Status with SARS-CoV2 infection

 # 3311

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Introduction

SARS-CoV2 accesses the body across mucosal surfaces, largely those of the upper respiratory tract including the oral cavity[1,2]. There is increasing evidence of disparities in susceptibility to SARS-CoV-2 infection and subsequent morbidity and mortality to COVID-19 amongst groups of different ethnic origin. In the UK, South Asian populations have been identified as a particularly susceptible group, with a higher percentage mortality[3,4]. It has been suggested that there may be a relationship between periodontal diseases susceptibility / severity and severity of COVID-related pathology[5].

Goal

This study aimed to investigate relationships between periodontal status, self reported COVID severity and other factors in participants in a study of cellular and humoral innate immunity focused on White British (WB) and South Asian British (SA) ethnic groups.

Methods

Adult participants with and without previous COVID episodes confirmed by lateral flow tests completed a range of questionnaires related to factors such as age, ethnicity, smoking and diabetes status and underwent a periodontal assessment including full intraoral charting and BPE/PSR assessment. COVID vaccination history, numbers of symptoms and severity were recorded. Summary variables, including PISA scores[6] and a COVID severity score (CSS) based on the number and severity of reported symptoms during infections, were generated.

Results

Population demographics

Of the 247 participants, 186 (75.6%) were female, and 60 (24.4%) male, mean age 43.07 years, (SD 17.45). Of the women, 46 (24.7%) were post-menopausal. Only 20 participants were smoking. Just over half (131, 53.04%) were classified as White British, the rest were South Asian ethnicity. In total 7 (3.21%) reported type 1 or type 2 diabetes under management, 5 were from WB 2 from SA groups.

Oral health, ethnicity and age

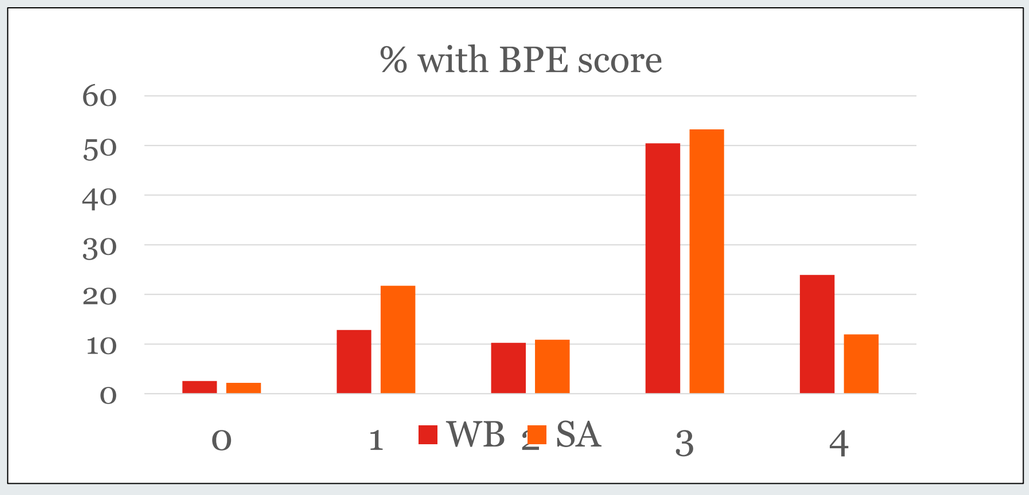
The median number of teeth present was 28, with an interquartile range of 17-32.

30% of participants had a PSR score of <=2, 52% PSR=3 and 19% PSR=4

There was a significantly (p=0.02) higher BPE score (mean 2.8, SD 1.03) in the White British compared to the South Asian (mean 2.51, SD 1.03) participants, related to the higher number with BPE4 sextants, but this difference was not seen for any other measures of periodontal status or inflammation.

TABLE 1 periodontal parameters by ethnic group

	South Asian British		White British		*P*, Mann-Whitney test
	Median	IQR	Median	IQR	
Mean probing depth,mm	*2.0*	*1.4-3.2*	1.9	1.4-3.2	0.131
Bleeding score	*11.8*	*0-61.1*	15.4	0-68.8	0.289
Sites probing over 3mm	*3*	*0-42*	3	0-44	0.629
Sites probing over 5mm	*0*	*0-9*	0	0-9	0.966
PISA score, mm^2	*148.8*	*0-960.9*	185.6	0-1270	0.264



Results, continued

This may have been related to the significant (P<0.0001) difference in age between groups (WB mean 49.66, sd 18.19, versus SA 35.62, sd 13.12).
When participants were dichotomised by BPE scores (0,1,2 vs 3&4). those with higher scores were significantly (p=0.032) older (mean 44.32, sd 1.25 years) than those with lower scores (mean 39.35, sd 2.33 years).

However, there were no significant correlations between PISA score, probing depth measurements or bleeding scores and age. Smoking did not impact mean probing depth but did reduce mean bleeding score 11.19%, SD 10.90 versus 20.39%, SD 19.72, p=0.05) and, as a result, PISA score also.

COVID severity

Mean CSS was greater (p=0.0322) in those of SA heritage (46.55, SD 36.69) than those in the WB group (36.92, SD 37.23), and in women (44.34, SD 37.98 versus men 32.42, SD 33.76, p=0.0346) but did not vary for smokers or those with (controlled) diabetes.

Relationships between periodontal status, other factors and COVID severity

There were weak negative correlations (rho = -0.12) approaching statistical significance between CSS and the number of sites probing >3mm and >5mm, but both these periodontal variables and smoking status were not related to ethnicity.

Linear regression analysis of the whole population data set was carried out investigating the impact of age, gender, BMI, smoking status, diabetes diagnosis, probing depths, PISA and bleeding scores on CSS.

This showed that age alone had a significant impact on CSS, allowing for other covariates. There was no significant relationship between ethnicity, BMI, smoking or periodontal status and CSS.

covscore	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
age	-.4325305	.1792872	-2.41	**0.017**	-.7865392	-.0785218
ethn	1.114782	6.202767	0.18	0.858	-11.1328	13.36236
sex	-3.780394	6.273713	-0.60	0.548	-16.16806	8.607269
bmi	.2746818	.5185922	0.53	0.597	-.7492965	1.29866
smoke	-10.6904	9.518617	-1.12	0.263	-29.48524	8.104436
xpd	-3.263564	5.04686	-0.65	0.519	-13.22876	6.701635
bldsc	.0599823	.1520454	0.39	0.694	-.2402367	.3602012
_cons	62.28822	22.42402	2.78	0.006	18.01122	106.5652

R^2= 0.06

Whilst similar results were seen for the WB subpopulation, these relationships were not seen within the isolated SA group (who were significantly younger as reported above). However, within this population there was a tendency for diabetes status to be related to CSS, reaching significance (p=0.025) if the number of symptoms reported was considered.

covscore	Coef.	Std. Err.	t	P>|t|	[95% Conf.	Interval]
_ age	-.2558256	.3438531	-0.74	0.460	-.9434024	.4317511
sex	-10.02993	11.13116	-0.90	0.371	-32.28806	12.22819
bmi	.5602694	1.158637	0.48	0.630	-1.756568	2.877107
smoke	-13.18668	15.1039	-0.87	0.386	-43.38879	17.01543
dm	-49.39845	26.90206	-1.84	**0.071**	-103.1924	4.395539
xpd	2.351322	8.734733	0.27	0.789	-15.11486	19.8175
bldsc	-.1522145	.2203165	-0.69	0.492	-.5927647	.2883356
_cons	53.40428	33.38013	1.60	0.115	-13.34342	120.152-

R^2= 0.07

Conclusions

In this study population, there was minimal evidence of association between periodontal status and COVID severity score. However, there was a significant difference between groups for some critical variables such as age, and this study was dependent (due to delays in initiation) to retrospective self report for COVID assessment. These factors may have affected findings. Diabetes may have impacted COVID severity in the younger South Asian British population.

.**References**
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