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Prevalence of Corona Virus in Preoperative Patients in a Tertiary Care Hospital in Chennai

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A B S T R A C T

Coronavirus disease 2019(covid-19), the highly contagious viral illness caused by severe acute respiratory syndrome coronavirus 2(SARS-COV-2), became a major global health crisis and need to give specialized care to COVID-19 patients and prevention of the spread of infection to the healthcare professionals. A major challenge to this is that covid-19 can present in the pre or asymptomatic transmission phase, and identifying patients with such conditions may be quite difficult.Therefore, the objective of the study was to determine the prevalence of the coronavirus infection among patients who got admitted to hospital for elective surgery.Methods:Samples were collected as the nasopharyngeal and oropharyngeal swabs and processed by a standard real time reverse transcription polymerase chain.Results:Totally 1423 participants were undergone for preoperative testing for covid-19. Overall, 1.3% of preoperative patients were tested positive. Majority of them were inthe 21 to 60 years(74.2%) age group. Half of them were females (49.3 %).Among 18 positives for covid-19, 13(72%) were asymptomatic and 5(28%)were symptomatic while screened for surgery.Conclusion:Our study concludes screening of all patients in the preoperative phase whether symptomatic or asymptomatic will protect and ensure the safety of both patient and health care workers.

Introduction

Coronavirus disease 2019 (covid-19), the highly contagious viral illness caused by severe acute respiratory syndrome coronavirus 2(SARS-COV-2), had a catastrophic effect on the world's demographics resulting in more than 3.8 million deaths worldwide, emerging as the most consequential global health crisis (Nekkanti *et al.*, 2020). The severe acute respiratory syndrome coronavirus 2 (coronavirus disease 2019) (SARS-COV-2)(COVID-19) pandemic of 2020 has brought in changes and demands to the existing infrastructure of healthcare setups, both in terms of imparting specialized care to COVID-19 patients and prevention of the spread of infection to the healthcare professionals (Kannan *et al.*, 2020).

A major challenge to this is that covid-19 can present in the pre or asymptomatic transmission phase, and identifying patients with such conditions may be quite difficult. Hence elective testing before surgeries has been proposed by international authorities, based on local transmission rate, type of

surgery being done and the amount of presumed exposure (Kannan *et al.,* 2020).

Patients with COVID-19 infection have increased risk of postoperative complications and mortality. Our hospital has implemented mandatory preoperative SARS-COV-2 testing for all patients before elective surgery to ensure the safety of patients and health care workers. Therefore, the objective of the present study was to determine the prevalence of the coronavirus infection among patients who got admitted to hospital for elective surgery.

Materials and Methods

This observational study was conducted in the Department of Microbiology, ACS Medical College and Hospital from December 2020 to December 2021. After getting Institutional Ethics Clearance (No:99/2020/IEC/ACSMCH Dt. 16.12.2020).

Patients who were scheduled for any type of elective surgical or interventional procedures were screened for COVID-19. Emergency surgery cases were excluded from the study.

A Standard questionnaire was given to all the patients to collect the demographic and vaccination details. Totally 1423 participants were included in this study. Nasopharyngeal and oropharyngeal swabs were collected and transported in viral transport media. Samples were processed by a standard real time reverse transcription polymerase chain reaction using standard protocols (Bence *et al.,* 2021).

The extraction was done with MERIL RNA EXTRACTION KIT and the elute was further processed by using MERIL COVID-19 ONE STEP RT-PCR Kit for detection of SARS-COV-2. The target genes were ORF1ab gene and Nucleoprotein N gene. CT value for ORF 1ab gene and N gene less than or equal to 35 is interpretated as positive and above 35 was interpretate as negative (RT-PCR).The results obtained were tabulated and analysed using SPSS software.

Results and Discussion

This study was conducted in ACS Medical college and hospital. Totally 1423 participants were enrolled in the study. The mean (SD) age of the participants was 43.74(17.08) years and it ranged from 1 to 94 years. Majority of them were in the 21 to 60 years (74.2%) age group. Half of them were females (49.3 %). The demographic details of the patients were shown in [table 1]. Among 1423 participants' who were screened for coronavirus preoperatively, 18 were tested covid positive.

Among 18 positives for covid-19, 13(72%) were asymptomatic and 5(28) were symptomatic while screened for surgery [Table 6]. So the prevalence among preoperative patients was 1.3%.

In all age groups, the proportion of covid test results positive and negative were similar.

The proportion of vaccinated participants were higher in the 21 to 40 years age group (27 %), followed by 41 to 60 years age group (21 %). Most of the Non vaccinated participants were in the below 20 years age group (89 %), followed by above 80 age group(87.5 %) and 61 to 80 age group(81.7 %) and this proportion difference is statistically significant(p=0.002)[Table 3].

The proportion of covid test positive and Negative result were similar between males and females and it was not also statistically significant (p=0.172)[Table 4]. Males were highly vaccinated compared to females but it was not statistically significant(23.7 % vs 19.7 %, p=0.062)[Table5]

Table.1 Basic Demographic Details of the Participants

	n	%
Age **Mean (SD)** **Min – Max**	 43.74(17.08) 1 – 94	
Age distribution **≤20** **21 – 40** **41 – 60** **61 – 80** **>80**	 111 499 556 241 16	 7.8 35.1 39.1 17.0 1.12
Gender **Male** **Female**	 721 702	 50.7 49.3
COVID test result **Negative** **Positive**	 1405 18	 98.7 1.3
Vaccine Status **Vaccinated** **Non- Vaccinated** **Missing**	 307 1103 13	 21.6 77.5 0.9

Table.2 Comparison of Covid Test Result Across All Age Groups

Age distribution	COVID test			P value
	Negative, n(%)	Positive, n(%)	Total	
≤20	111(100)	-	111	0.616[F]
21 – 40	490(98.1)	9(1.8)	499	
41 – 60	550(98.9)	6(1.07)	556	
61 – 80	238(98.7)	3(1.24)	241	
>80	16(100)	-	16	
Total	1405	18		

Table.3 Comparison of vaccine status across all age groups

Age distribution	Vaccine			P value
	Vaccinated, n(%)	Non Vaccinated, n(%)	Total	
≤20	12(11)	97(89)	109	0.002[C]
21 – 40	133(27)	360(73)	493	
41 – 60	116(21)	435(79)	551	
61 – 80	44(18.2)	197(81.7)	241	
>80	2(12.5)	14(87.5)	16	
Total	307	1103		

Table.4 Comparison of COVID test result with gender

Gender distribution	COVID test			P value
	Negative n(%)	Positive, n(%)	Total	
Male	709(98.3)	12(1.6)	721	0.172[C]
Female	696(99.1)	6(0.8)	702	
Total	1405	18		

Table.5 Comparison of vaccine status with gender

Gender distribution	Vaccine			P value
	Vaccinated, n(%)	Non Vaccinated, n(%)	Total	
Male	170(23.7)	545(76.2)	715	0.062[C]
Female	137(19.7)	558(80.2)	695	
Total	307	1103		

Table.6 Comparison of symptomatic and asymptomatic in positive preoperative cases.

Total positive	Asymptomatic, n(%)	Symptomatic, n(%)
18	13(72)	5(28)

During the covid-19 pandemic, screening and quarantine became the main strategies to control the spread of the infection. Asymptomatic Covid cases were biggest hurdle in preventing the disease (Singh *et al.,* 2021). Covid-19 patients undergoing surgical procedure have a higher risk of mortality than the general population (Kaye *et al.,* 2020). Hence surgeries were avoided in covid-19 positive cases. Testing all patients before the surgery is an effective method of protecting healthcare workers. Most studies recommend screening covid-19 prior to surgery (Honavar, 2020).

In this study, the overall prevalence of covid-19 in preoperative patients was 1.3% which was similar to the study conducted in children's hospital by Bence *et al.,* (2021) which was 1.4%. In the study done in USA by Bloom *et al.,* shows the prevalence of positive cases in preoperative patients were 3%, which was high compared to our study. This difference may be due to difference in size of the study population and duration of the study (Bloom *et al.,* 2021). Further in the present study, among the study participants tested for COVID-19,13(72%) were asymptomatic. Asymptomatic patients seem to account for approximately 40% to 45% of SARS COV-2 infection. They can spread the infection to others for an extended period even longer than 14 days. Therefore, screening of all patients in the preoperative phase whether symptomatic or asymptomatic will protect and ensure the safety of both patient and health care workers.

In summary, some asymptomatic patients were found to be positive for SARS-COV-2 screening. So, symptom-based screening won't prevent transmission of disease. Hence, Surgeries to be done after mandatory screening of SARS-COV-2.

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