

CORRELATION OF AGE WITH COVID-19 IGG ANTIBODIES TITRE IN THE ADULT POPULATION OF MALEGAON: A PROSPECTIVE OBSERVATIONAL STUDY

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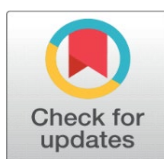
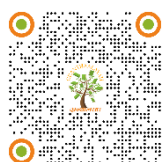
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ABSTRACT

Introduction: The year 2019 was affected by Pneumonia caused by SARS Cov 2 virus. This major health challenge whole world is facing and IgG antibodies titre has been widely used to assist the diagnostic and prognostic value. Important aspect of aging is decline in immune function. As per the aging process there are changes at humoral and cellular immune responses leading to impaired immune response which in turn leads to risk of infectivity and decreased vaccine responses. The current study's objectives were to assess the SARS-COV-2 antibody titre in the adult urban Malegaon population and to look for a relationship between age and antibody titre.

Methods: Individuals who were residing in densely populated Malegaon village where formerly COVID-19 was declared as hot spot during first wave were included with total sample size of 2454 and their blood samples were collected to get IgG antibodies from 12 January 2022 to 18 January 2022.

Results: In this study we found that when the age advances the % of antibody level doesn't change significantly. In 2454 samples there observed non-significant difference in antibody % and age group ($p > 0.05$)

Conclusion: These findings suggest extensive studies are required to bring uniform guideline for developing the vaccine strategy as age and antibodies level remained the same.

Keywords: IgG Antibody, Covid-19, Malegaon

1. INTRODUCTION

The impact of COVID-19 is still observed, and it has caused all age groups to suffer. From education to occupation and from lively hood to quality of life of various age groups has been the impact.

The worldwide deaths reported on May 31, 2021, were more than 3,50,000 amongst 171,000,000 confirmed cases. For detection for SARS-CoV-2, immunoglobulin markers were helped in diagnosis, treatment, and preventive vaccination plan. [Li et al. \(2020\)](#), [Hou et al. \(2020\)](#), [Long et al. \(2020\)](#)

'Immunosenescence' that is the effects on the immune system as per aging process are multifaceted. Aging impairs both innate and adaptive responses. Aging affects qualitative as well as quantitative parameters in the titer of immunity markers. These changes contribute in increasing the susceptibility of elderly persons to highly infectious Covid-19 like disease. [Frasca et al. \(2011\)](#)

Sero surveillance for Antibodies to SARS-CoV-2 provoking to COVID-19 can be detected in serum of people who have been either vaccinated against COVID-19 or who have recovered from Covid 19 or asymptomatic or mild symptomatic patients having history of COVID19. There is a change in immune response of B cells for exposition of surface immunoglobulin antibodies like IgG, IgE, or IgA. The defects in T and B cells is one of the reason due to which elderly individuals shows varied response towards vaccination and changes in the B cells molecular pathways causing secondary iso types formation with class switch recombination. Aging causes alteration at susceptibility and immunity so we have age related occurrences of diseases. Age also influences the person's immune response and secondarily allows person to prone for viral or Cov- 2 like respiratory infections to suffer. [Bajaj et al. \(2020\)](#)

Isolation of COVID-19 patients is possible once we have detected the SARS-COV2 antibodies. [Zainol Rashid et al. \(2020\)](#)

Studies showed that duration for which IgG antibody level reach to the peak are up to 3 weeks, which has maintained at high level up to 7 weeks and later on they wean off slowly and gradually. [Hou et al. \(2020\)](#), [Zeng et al. \(2020\)](#)

Recently COVID-19 has affected the age group of 3rd decade and onwards. More advance the age more the vulnerability and susceptibility to suffer from COVID-19. But children's age group, peoples with co- morbidities, elderly population and densely populated area are also some of the issues where the chances of immune response or development of herd immunity varies which may affect the individuals' antibody titre.

Response of bodies innate immunity against various unknown disease is in the form of developing antibodies to these foreign proteins. But with the advent of time and age, how long its effect will last could not be determined.

Malegaon has one of the highest densities of population in the nation at 19,000 inhabitants per square kilometer. A 2.33 day doubling rate on April 15, 2020 fell to 46 days by May 25, 2020, and then to 126 days by June 22, 2020. As of 22 June 2020, the town had 943 COVID-19 instances, according to information provided by the Malegaon Municipal Corporation.

2. MATERIALS AND METHODS

2.1. POPULATION

The study included 2454 adult participants from Malegaon's urban area. All of the individuals were verified to be locals of the same village where the initial COVID-19 hot zone was identified.

The study took place between 12 January 2022 and 28 May 2022. After receiving consent, completing a structured questionnaire, and receiving ethical approval, the general information about patients was gathered from the electronic medical records system in collaboration with Motiwala (National) Homoeopathic Medical College and Hospital and Maharashtra University of Health Sciences, Nashik.

2.2. ANTI-SARS-COV-2 IGG ANTIBODIES DETECTION

A blood sample of 5 ml. was collected and following coagulation, centrifuged at room temperature.

For the purpose of detecting antibodies, serum supernatant was collected. By using the ELISA procedure (Recombinant hACE2 Protein created strip), anti-SARS CoV-2 IgG antibodies were discovered.

The test kit's instructions state that 60 AU/ml is the threshold value for IgG antibodies. The Standard Operation Procedure was strictly followed throughout the whole detection process.

2.3. STATISTICS

By using a certain coding scheme, all data were entered into a computer and checked for entry problems. A MS Office Excel Sheet (v 2019, Microsoft Redmond Campus, Redmond, Washington, United States) was created using the data that was collected. The statistical package for social sciences (SPSS v 26.0, IBM) was used to analyze the data. For categorical data, descriptive statistics like frequencies and percentages, and mean and standard deviation for numerical data, have been shown. The t test was used to compare the two groups between themselves. One-way ANOVA was used for intergroup comparison (>2 groups), and the posthoc test was used for pairwise comparison. P 0.05 was deemed statistically significant for all tests using statistics, with error rates of 5% and 20%, giving the study power.

3. RESULT

3.1. DIFFERENT AGE GROUP

Table No. 1 shows the demographics of 2454 respondents in our study, whose ages ranged from 18 to 89, with a mean of 41.28 and SD 14.320.

Table 1

Table 1 Distribution as Per Minimum and Maximum Age					
	N	Minimum	Maximum	Mean	Std. Deviation
Age (Years)	2454	18	89	41.28	14.320

Table No. 2 demonstrates the frequencies of male and female subjects in the study of 2454 subjects where male is 1258 (51.3%) and female are 1196 (48.7%)

Table 2

Table 2 Distribution as Per Gender		
	Frequency	Percent
Female	1196	48.7
Male	1258	51.3
Total	2454	100.0

Table No. 3 gives intergroup comparison of phase I antibody % as per the age groups, which demonstrates that there was a statistically insignificant difference between the groups' data ($p > 0.05$).

Table 3

Table 3 Intergroup Comparison of Phase I Antibody % as Per the Age Groups										
Age Group	N	Mean	Std. Deviation	Std. Error	95% Confidence Interval for Mean		Minimum	Maximum	F value	p value of one-way ANOVA
					Lower Bound	Upper Bound				
18to19yrs	59	82.63	27.831	3.623	75.37	89.88	15	98		
20to29yrs	506	87.79	20.649	.918	85.99	89.59	7	99		
30to39yrs	639	88.45	19.724	.780	86.92	89.98	2	98	1.041	.400#
40to49yrs	550	88.54	20.389	.869	86.83	90.25	1	99		
50to59yrs	344	89.45	17.921	.966	87.55	91.35	6	98		
60to69yrs	268	89.11	19.177	1.171	86.80	91.41	3	98		
70to79yrs	74	88.86	18.820	2.188	84.50	93.23	9	98		
80to89yrs	14	84.43	26.173	6.995	69.32	99.54	20	98		
Total	2454	88.4	20.015	.404	87.60	89.19	1	99		

Interpretation:

Table 4

Table 4 Perason Correlation r Value		
		Age (Years)
Phase I Antibody %	Pearson Correlation r value	.034
	p value	.091
	N	2454

The relationship between the first variable (x) and the second variable (y) was examined using the Pearson product-moment correlation coefficient (r). There was statistically non-significant correlation between age vs Phase I Antibody % ($p > 0.05$)

4. DISCUSSION

Duration up to which there is persistence of SARS-COV-2 Antibody levels remains will decide the immunity for an individual to fight against deadly COVID-19 virus. A previous study shown the persisting effect up to 6 month. As these responses will help to formulate the assessment of re-infection and to set vaccination protocol [Liu et al. \(2021\)](#).

However, because SARS-CoV2 is a novel virus for all of us, it is important to continue monitoring the SARS-CoV2 antibody response as it ages. Rarely is the vaccination protocol for various population groups mentioned, and all individuals, regardless of age or gender, are given the same recommended vaccine dose and interval. Previous studies shown that there is early clearance of antibodies in the elder age group as compared with the younger age group. [Du et al. \(2020\)](#), [Ueno et al. \(2021\)](#)

Environmental factors, such as nutrition, addiction, customs and rituals and various psychological factors also exert significant influence on the immune system with aging. Though to monitor the onset of immunosenescence are very complex. [Crooke et al. \(2019\)](#)

In contrast to our study, where we discovered no significant link, there was a substantial correlation between the subjects' age and their COVID 19 antibody status. [Rawandale et al. \(2022\)](#)

Further clinical research on the variable humoral immune response following vaccination and the precise immunization strategy for people in different age groups is required.

We could not find evidence that the younger patients had higher levels of IgG antibodies than the older patients, which calls for more research into the topic.

CONFLICT OF INTERESTS

None.

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