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Post COVID 19 Diabetes Prevalence of Non-Communicable Diseases in Rural Population: A Cross Sectional Study from Maharashtra

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KEYWORDS
Prevalence, hypertension, non-communicable diseases,post covid 19

ABSTRACT:

Background: Growing evidence suggest that people infected with SARS-CoV-2 have increased risk of incident diabetes and incident use of antihyperglycemic therapy in the post-acute phase of the disease with a trend toward increasing risk according to pre-existing conventional risk factors for diabetes itself.

Objective: To determine the prevalence of certain non-communicable diseases after covid 19 pandemic.

Methodology: The present cross sectional observational study was carried out in Sastur village involving individuals aged 18 and above from the village from January to February 2024.

Results: Majority of the individuals were from 20-40 years age group i.e. 46.2%. 69.2% were males and 30.8% were females. Prevalence of hypertension as 25%, cardiac morbidity 13.5% and COPD as 11.5%

Conclusion: Prevalence of hypertension as 25%, cardiac morbidity 13.5% and COPD as 11.5%. Prevalence was higher in males and in ages above 40 years.

Introduction

In December 2019, an unknown disaster was identified in Wuhan, China. The government of China acted quickly to suppress the pandemic and conducted etiological studies. The World Health Organization (WHO) tentatively named the new virus 2019 novel coronavirus (2019-nCoV) on January 12, 2020. On February 11, 2020, the 2019-nCoV disease was triggered in China and the WHO was named as the coronavirus disease 2019 (COVID19).[1]

In the future, the presence of new corona virus is the most common one for human beings because of climate change and human and animal interaction. In some clinical circumstances, it has been discovered that some virus carriers are without any symptoms, with no fever and only slight symptoms of infection. Without identifying these asymptomatic patients, the unsuspecting virus carriers can spread very quickly and effectively. It also has the ability to increase the danger of disease transmission. As a result, in order to track down unknown COVID-19 sources, the rapid and precise screening of suspected virus carriers and diagnosis of asymptomatic patients is critical for prevention at the earlier stage. [2]

There are several clinical manifestations after SARS-CoV-2 infection, including medium and long-term COVID-19 sequelae, that need particular attention mostly because of their relationship with other comorbidities.[3] It has been observed that advanced age and presence of comorbidities such as diabetes, hypertension and obesity are associated with the most

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severe forms of COVID-19. [4] Since the first reports on COVID-19 epidemic diabetic patients turned out to be at increased risk of acute complications after SARS CoV- 2 infection, and even at high risk to subsequently develop various and diverse symptoms characterizing the so-called "Long Covid syndrome".[5] Growing evidence also suggests that the numerous clinical abnormalities of long Covid might even extend to new onset diabetes.[6]

Growing evidence suggest that people infected with SARS-CoV- 2 have increased risk of incident diabetes and incident use of antihyperglycemic therapy in the post-acute phase of the disease [7, 8] with a trend toward increasing risk according to pre-existing conventional risk factors for diabetes itself. This evidence is however not universally consistent, especially when looking at the time of onset of diabetes after SARS-CoV-2 infection.[9]

Hence, we planned to conduct the study with the objective to assess the post covid 19 morbidity profile with special reference to NCD in one of the villages from Osmanabad district of Maharashtra.

Objective:

1. To determine the prevalence of certain non-communicable diseases after covid 19 pandemic.
2. To study the association of non-communicable diseases after covid 19 pandemic with age and gender

Materials and methods

Study setting: Community based study

Study population: All individuals aged 18 and above from the village

Study period: January to February 2024

Study design: Cross sectional observational study

Methods of data collection:

All subjects fulfilling the eligibility criteria were included in the study. Informed consent was taken. Details of the cases were recorded in the prescribed format. All the details like name, age, gender, SES, covid 19 events like hospitalisation, duration of hospitalisation and vaccination details were recorded. Verbal autopsy related to non-communicable diseases like diabetes, hypertension, stroke, cardiovascular ailments etc were recorded. Blood pressure measurement was carried out as per WHO criteria. Old as well as new cases were recorded. Data was collected by using a structure proforma. Data thus was entered in MS excel sheet and analysed by using SPSS 24.0 version IBM USA. Qualitative data was expressed in terms of percentages and proportions. Association between two qualitative variables was seen by using Chi square/ Fischer's exact test. A p value of <0.05 was considered as statistically significant whereas a p value <0.001 was considered as highly significant.

Results

Table 1: Distribution according to age group and gender

		Frequency	Percent
Age group	18 to 20	6	1.9
	20 to 40	144	46.2
	41 to 60	90	28.8
	Above 60	72	23.1
	Total	312	100.0
Gender	Male	216	69.2
	Female	96	30.8
	Total	312	100.0

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We included a total of 312 individuals aged 18 and above in our study. Majority of the individuals were from 20-40 years age group i.e. 46.2% followed by 28.8% from 41-50 years age group, 23.1% from above 60 years age and 1.9% from 18-19 years age group.

Gender wise distribution of the study population revealed that 69.2% were males and 30.8% were females.

Table 2: Distribution according to sociodemographic information

		Frequency	Percent
Type of family	Joint	222	71.2
	Nuclear	90	28.8
	Total	312	100.0
Socio- economic status	Upper	0	0.0
	Upper middle	48	15.4
	Middle	150	48.1
	Lower middle	102	32.7
	Lower	12	3.8
	Total	312	100.0

Majority of the individuals were from joint family i.e. 71.2% and 28.8% from nuclear family. Sociodemographic status of the study population showed that majority were from middle SES class i.e. 96.2% and only 3.8% from lower SES.

Table 3: Distribution according to sociodemographic information

		Frequency	**Percent**
Morbidity profile	Hypertension	78	25.0
	Cardiac morbidity	42	13.5
	Autoimmune disorder	6	1.9
	COPD	36	11.5
	Stroke	18	5.8

Morbidity survey of non-communicable diseases in our study revealed prevalence of hypertension as 25%, cardiac morbidity 13.5%, COPD as 11.5%, autoimmune disorders 1.9%.

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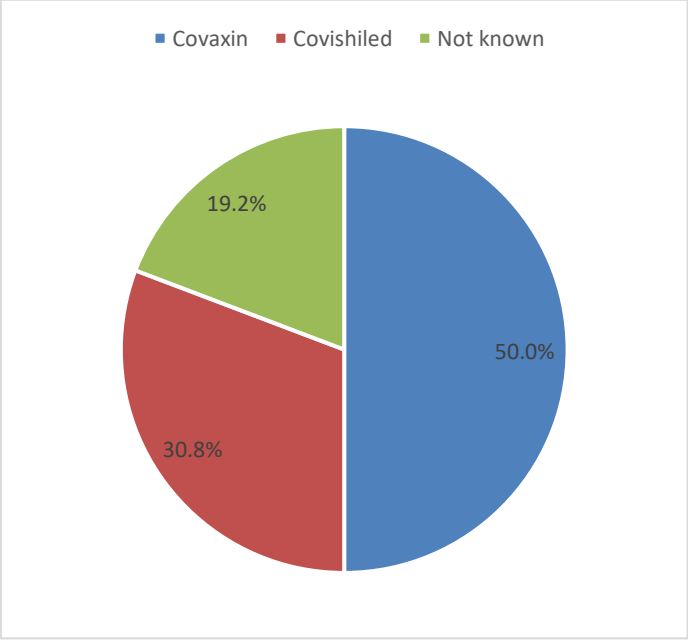
Table 4: Distribution according to covid 19 events

		Frequency	Percent
Hospitalized for Covid-19	Yes	186	59.6
	No	126	40.4
	Total	312	100.0
Duration of hospitalisation	< 5 days	94	50.5
	5 - 6 days	92	49.5
	Total	186	100.0

Out of 312 individuals, 186 were hospitalized for covid 19 ailments leading to admission rate of 59.6%. 50.5% cases the duration of hospitalization was less than 5 days. 49.5% cases the duration of hospitalization was more than 5 days.

Figure 5: Distribution according to covid 19 vaccination status



Majority of our study population (50%) has taken covaxin and 30.8% has taken Covishield.

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Table 5: Prevalence of non-communicable ailments according to age group

		18 to 19 (n-6)		20 to 40 (n-144)		41 to 60 (n-72)		Above 60 (n-90)		Total	p
		No	%	No	%	No	%	No	%		
Hypertension	Yes	0	0.0	6	5.3	30	41.7	42	46.7	78	0.001
	No	6	100.0	138	121.1	60	83.3	30	33.3	234	
Cardiac condition	Yes	0	0.0	0	0.0	12	16.7	30	33.3	42	0.001
	No	6	100.0	144	126.3	78	108.3	42	46.7	270	
Autoimmune disease	Yes	0	0.0	0	0.0	0	0.0	6	6.7	6	0.001
	No	6	100.0	144	126.3	90	125.0	66	73.3	306	
COPD	Yes	0	0.0	0	0.0	12	16.7	24	26.7	36	0.001
	No	6	100.0	144	126.3	78	108.3	48	53.3	276	
Stroke	Yes	0	0.0	6	5.3	6	8.3	6	6.7	18	0.56
	No	6	100.0	138	121.1	84	116.7	66	73.3	294	

Higher prevalence of hypertension was found in 41-60 years (41.7%) and above 60 years (46.7%). Higher prevalence of cardiac ailments was found in 41-60 years (16.7%) and above 60 years (33.3%). Higher prevalence of auto immune disorders was found in above 60 years (6.7%). Higher prevalence of COPD was found in 41-60 years (16.7%) and above 60 years (26.7%). Higher prevalence of stroke was found in 41-60 years (8.3%) and above 60 years (6.7%).

Table 6: Prevalence of non-communicable ailments according to gender

		Male (n-216)		Female (n-96)		Total	p
		No	%	No	%		
Hypertension	Yes	60	27.8	18	18.8	78	0.089
	No	156	72.2	78	81.3	234	
Cardiac condition	Yes	42	19.4	0	0.0	42	0.001
	No	174	80.6	96	100.0	270	
Autoimmune disease	Yes	6	2.8	0	0.0	6	0.09
	No	210	97.2	96	100.0	306	
COPD	Yes	36	16.7	0	0.0	36	0.001
	No	180	83.3	96	100.0	276	
Stroke	Yes	18	8.3	0	0.0	18	0.004
	No	198	91.7	96	100.0	294	

27.8% males were hypertensives as compared to 18.8% hypertensive females ($p > 0.05$). 19.4% males were having cardiac ailments as compared to 0% females ($p < 0.05$). 16.7% males were having COPD as compared to 0% hypertensive females ($p < 0.05$). 16.7% males were having COPD as compared to 0% hypertensive females ($p < 0.05$). 8.3% males were having stroke as compared to 0% hypertensive females ($p < 0.05$).

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Discussion

Sociodemographic characteristics

We included a total of 312 individuals aged 18 and above in our study. Majority of the individuals were from 20-40 years age group i.e. 46.2% followed by 28.8% from 41-50 years age group, 23.1% from above 60 years age and 1.9% from 18-19 years age group. Gender wise distribution of the study population revealed that 69.2% were males and 30.8% were females. **(Table 1)**

Majority of the individuals were from joint family i.e. 71.2% and 28.8% from nuclear family.

Sociodemographic status of the study population showed that majority were from middle SES class i.e. 96.2% and only 3.8% from lower SES. **(Table 1)**

Majority of the individuals were from joint family i.e. 71.2% and 28.8% from nuclear family. Sociodemographic status of the study population showed that majority were from middle SES class i.e. 96.2% and only 3.8% from lower SES. **(Table 1)**

Sharif N. et al[10] included 3,250 participants from seven divisions in Bangladesh. Nearly 73.4% (2,385 of 3,250) of the participants were COVID-19 positive. The mean (SD) age of the study population was 49 ± 3.6 years. Majority of the participants (66.5%) aged above 40 years. The ratio of male to female was 2,340:910 (about 2.6:1). Majority of the participants (65.1%) were from semi-urban and rural areas with poor health facilities. About 96% of the population were from native Bangladeshi. Majority of the participants (68.9%) had a monthly income below 50,000 Bangladeshi taka (500 USD). The availability of health facility and effective treatment varied significantly on monthly income and place of residence in Bangladesh.

Morbidity post covid 19 and association with age and gender

In our study, morbidity survey of non-communicable diseases in our study revealed prevalence of hypertension as 25%, cardiac morbidity 13.5%, COPD as 11.5%, diabetes 1.9%, autoimmune disorders 1.9%. **(Table 3)**

In our study, higher prevalence of hypertension was found in 41-60 years (41.7%) and above 60 years (46.7%). Higher prevalence of cardiac ailments was found in 41-60 years (16.7%) and above 60 years (33.3%). Higher prevalence of auto immune disorders was found in above 60 years (6.7%). Higher prevalence of COPD was found in 41-60 years (16.7%) and above 60 years (26.7%). Higher prevalence of stroke was found in 41-60 years (8.3%) and above 60 years (6.7%). **(Table 5)**

In our study, 27.8% males were hypertensives as compared to 18.8% hypertensive females ($p > 0.05$). 19.4% males were having cardiac ailments as compared to 0% females ($p < 0.05$). 16.7% males were having COPD as compared to 0% hypertensive females ($p < 0.05$). 16.7% males were having COPD as compared to 0% hypertensive females ($p < 0.05$). 8.3% males were having stroke as compared to 0% hypertensive females ($p < 0.05$). **(Table 6)**

Sharif N. et al[10] in their study reported that among the pre-existing health conditions, cardiovascular (CVD) disease was the most prevalent (32%, 1,040 of 3,250) followed by diabetes (24%, 780 of 3,250; Type 2 diabetes mellitus was 63.7% and Type 1 was 36.3%). We detected at least 532 (16.4%) patients of COVID-19 had both CVD and diabetes at the same time. Health complications associated with CVD increased among 673 of 1,040 (64.7%) patients and diabetes among 429 of 780 (55%) after patients getting COVID-19 infection. Co-prevalence of CVD, diabetes and acute long-COVID-19 was found among 11% (359 of 3,250) patients. Further, co-prevalence of CVD, diabetes and chronic long-COVID-19 were detected among 11.9% (387 of 3,250) patients. Distribution of CVD, diabetes, acute long-COVID-19 and chronic long-COVID-19 were higher among male than female. Nearly, 7.1% (231 of 2,130) patients with CVD and diabetes had problem to take proper treatment during COVID-19 infection.

Previous studies have reported the prevalence of diabetes between 10% and 100% among patients with COVID-19.[11-18]

Previous studies have reported the prevalence of cardiovascular disease between 2% and 40% in patients

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with COVID-19 in different countries.[19-23] coronary artery disease was the most frequent cardiovascular disease followed by hypertension, cardiac arrhythmia and congestive heart failure, respectively.

Conclusion:

- Morbidity survey of non-communicable diseases in our study revealed higher prevalence of hypertension as 25%, cardiac morbidity 13.5% and COPD as 11.5%.
- Higher prevalence of hypertension was found in 41-60 years
- Higher prevalence of diabetes was found in above 60 years
- Prevalence of all NCD was higher in male population

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