



# Post COVID-19 Pandemic and Vaccination Health Consequences: A case control study.

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## ABSTRACT:

Dramatically on March 11<sup>th</sup> 2020, the novel Corona virus disease (COVID-19), was described as a pandemic by World Health Organization (WHO). Spreads all over the world since three years the viral mutants with different name categorized into four subgroups, named as  $\alpha$ -,  $\beta$ -,  $\gamma$ - and  $\delta$  are still existing with low virulence. Most people of Bhopal, M.P, who got infected with coronavirus disease in the year 2020 & 2021 (COVID-19) hospitalised and recover within a few weeks. But after few months some people even those who experienced with mild versions of the disease with very less symptoms, they developed some health issues which they never go through in past health history. These ongoing health problems are sometimes define with different synonyms like post-COVID-19 syndrome, post-COVID conditions, long COVID-19, long-haul COVID-19, and post-acute-squeal of SARS COV-2 infection (PASC). The triggering of different health issues and some autoimmune conditions by viral infections become a major topic of concern to the scientific community now a day. There is no test that determines if the present health condition is due to COVID-19 infection or due to Vaccination. We conducted a health history survey of 1000 individuals belongs to Covid-19 survivors category, and not infected by Covid-19 category. A group of 50% male & 50% female Vaccinated and Non-vaccinated with age group of 18 to 80 years belongs to Bhopal and its peripheral areas, with proper approval by (IEC. No: 98.4/JNCH/RES/2021) Institution Ethical Committees of Jawaharlal Nehru Cancer Hospital & Research Centre, Idgah Hills Bhopal, M.P. After signing the informed concern by the subjects and there complete health history was taken and 2ml of peripheral blood was collected in Heparin tubes for further lab experiments. Data was statically analysed with different parameters by IBM-SPSS-27 important aspect are notable showing an increase in the overall incidence with different health issue and range of autoimmune conditions in individuals

after infection. In this study we found that the proportion of patients after 2 years of COVID-19 infection was 30.2% with hospitalization history and 69.8% for those not requiring hospitalization (Home Isolation). And as per vaccination 63.7% of individuals have two doses of vaccine, 35.4% have booster dose and only 0.8% individual have only single dose. No significant differences in health issues or post-COVID-19 symptoms were seen between hospitalized and nonhospitalized patients. It is quite complicated to correlate these health issues as side effects of vaccination or it is due to Covid-19 infection, because large proportion of vaccinated individuals with double dose and booster dose are facing different health issues after two years of Covid-19 exposure. This knowledge will also be highly pertinent for future pandemics and for analysing the long-term effects of different viral infections like SARS COV-2 and the suspected vaccinations particularly those that obtained emergency use authorization without undergoing vigorous clinical trials.

**Keywords:** Covid-19 survivors, Health history, Post Covid complications, Vaccination.

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## 1. INTRODUCTION:

The Coronavirus disease 2019 (COVID-19) pandemic was originated from Wuhan city, Hubei province, China in December 2019. In the month of March'2020 Bhopal, M.P have reported its first Covid-19 positive case. After few days the Bhopal city ranked on second position after Indore as the number with Covid-19 positive cases increased. The situation turn out to be worst in the second wave caused by Delta variant of SARS COV-2. The outbreak of the pandemic mostly effected the human health and has severely been observed as a reason for increased death cases all over the globe. SARS-CoV-2 is an RNA virus, a member of the coronavirus family of viruses, similar to SARS-CoV.<sup>3</sup> Like SARS-CoV, SARS-CoV-2 infects humans by binding to the angiotensin-converting enzyme 2 (ACE2) receptor on the surface of the cell through its spike domain.<sup>3</sup> Infected patients present with a variety of manifestations. Physicians are observing persisting symptoms and unexpected, substantial organ dysfunction after SARS-CoV-2 infection in an increasing number of patients who have recovered, as previously observed in the SARS outbreak. (Zhang P., *et al.* 2020) However, COVID-19 is a new disease and uncertainty remains regarding the possible long-term health sequelae. This is particularly relevant for patients with severe symptoms, including those who required mechanical ventilation during their hospital stay, for whom long-term complications and incomplete recovery after discharge would be expected. Unfortunately, few reports exist on the clinical picture of the aftermath of COVID-19. Patients with a history

of active malignancy might be at increased risk of contracting the virus and developing COVID-19-related complications. (Liang W, *et al.*, 2020 & Miyashita H, *et al.* 2020) yet, initial reports are restricted by sample size, geographical region, and a lack of generalise ability of findings to the overall population of patients with cancer. Patients with cancer might be immune compromised by the effects of antineoplastic therapy, supportive medications such as steroids, and the immunosuppressive properties of cancer itself; they might also have an augmented immune response to infection secondary to immunomodulatory drugs, such as programmed cell death 1 or programmed cell death ligand 1 inhibitors. (Blimark C, *et al.*, 2015).

### **1.1 Covid-19 Vaccination fiasco:**

In COVID-19 epidemic an extensive and coordinated international research has led to the hurried progress of so called effective vaccines. Even though the vaccines are now well-thought-out the best way to attain combined safety and control over mortality, due to the precarious situation, these vaccines have been allotted the emergency use authorizations and many of their possible short time as well as long term side effects have been ignored or overlooked. At the same time, there are many cases of severe complications even death was reported as side effects after receiving single and further doses of COVID-19 vaccine. As per these reports, vaccination gives many adverse event which was not reported as well, especially on Nervous system, Cardiac system, Diabetes, Thyroid, weaken eyesight and in many cases trigger of autoimmune diseases reported after 2 years of Covid prevalence and impact. The utmost important and common complications are Cerebrovascular disorders including Cerebral venous sinus thrombosis, Transient ischemic attack, Intracerebral hemorrhage, Ischemic stroke, and Demyelinating disorders including Transverse myelitis, first manifestation of MS, and Neuromyelitis optica. These properties are often acute and transient, nevertheless they can be more severe and even causes fatal in a few cases. Herein, Roya.H and team have provided a comprehensive analysis of documents reporting neurological side effects of COVID-19 vaccines in worldwide databases from 2020 to 2022 and discussed neurological disorders possibly caused by vaccination. (Roya Hosseini, *et al.*, 2023)

## **2. MATERIAL & METHODS:**

A total of 980 volunteer participated in the study, 500 volunteer are Non Covid-19 & 480 volunteer are Covid-19 survivors with a response rate of 89.5%. Age of the population was divided into two age groups 18 to 40 years & 41 to 80 years. After taking approval from IEC, JNCH & RC, Bhopal (98.4/JNCH/RES/26.07.2021).

IEC approved health history questioner was taken with informed consent form was signed by the volunteer. Peripheral blood was taken in heparinised sample tubes for further parameters like, Blood Glutathione and Micronucleus assay.

**2.1 Registration of Volunteers:** By conducting Health & Cancer awareness camps as shown in (photograph No.1) different locations of Bhopal and its nearby locations like Schools, Colleges, Bhopal Utsav mela camp' 2022 & 23 and old registered patients of Jawaharlal Nehru Cancer Hospital & Research Centre, Bhopal, M.P.

**2.2 Health history Questioner:** A complete health history was taken from all volunteers, it covers all major events related to their health around 70 questions are covered especially post covid-19 health situations.

**2.3 Consent Form:** A consent form in Hindi & English was explained to each and every individual and after acceptance their health history details and Blood sample was taken.

**2.4 Data Analysis:** IBM-SPSS- Version 27, It is a powerful statistical software platform. It offers a user-friendly interface and a robust set of features that lets your organization quickly extract actionable insights from your data. Advanced statistical procedures help ensure high accuracy and quality decision making. All facets of the





analytics  
lifecycle  
are  
included,  
from data

preparation and management to analysis and reporting. **Photographs: 01** Showing Health & Cancer awareness camps organised by Department of Research & Clinical Genetics, JNCH & RC, Bhopal, on different locations of Bhopal to collect Health history & Blood sample of screened individuals.

### 3. Observations:

A total of **980** individuals with **500** Non Covid-19 and **480** Covid-19 survivors with (42.3% Females & 57.7% Male with 'p' value of <0.001 two tailed) out of these Covid-19 survivors individuals **335** are Non-hospitalized (House Isolated) patients (69.8%), and **145** are hospitalized (30.2%) under medical supervision were included. Following given below health issues data was statically analysed with different parameters by **IBM-SPSS-27**.

**TABLE NO: 01**

Table showing Reliability test of Covid-19 survivors by **IBM-SPSS-27: (0.658)**

<b>Case Processing Summary</b>			
		N	%
Cases	Valid	480	100.0
	Excluded <sup>a</sup>	0	.0
	Total	480	100.0

a. Listwise deletion based on all variables in the procedure.

<b>Reliability Statistics</b>	
Cronbach's Alpha	N of Items
.658	70

**TABLE NO: 02**

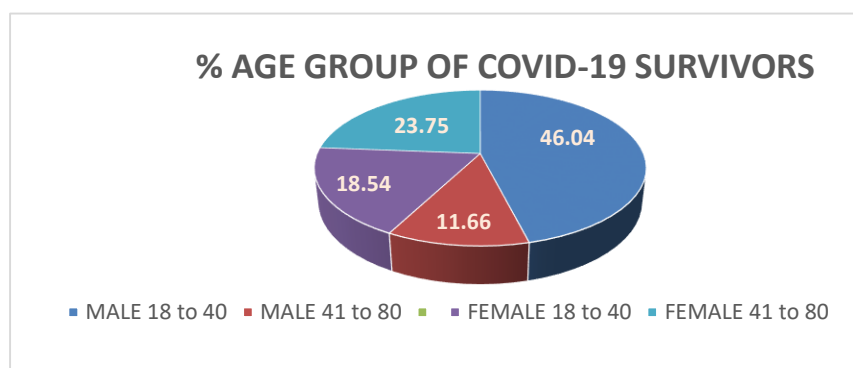
Table showing Covid-19 survivors Male & Female of different age groups:

S.NO	SEX	AGE GROUP	COVID POSITIVE	PERCENTAGE
1	MALE	18 to 40	221	46.04
2		41 to 80	56	11.66
3	FEMALE	18 to 40	89	18.54
4		41 to 80	114	23.75
<b>TOTAL SUBJECTS</b>			<b>480</b>	<b>99.99</b>

**Z=480**

The two-tailed P value is less than **0.0001**

By conventional criteria, this difference is considered to be extremely statistically significant.



**GRAPH NO: 01** Pie chart showing percent age division of Covid-19 survivors enrolled in the study.

**TABLE NO: 03**

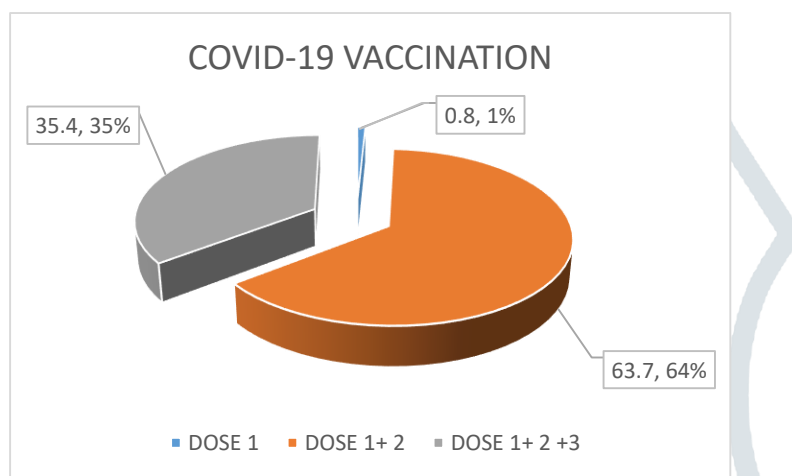
Showing Covid-19 vaccination status of Covid-19 survivors.

VACCINATION	NO. OF INDIVIDUALS	PERCENTAGE
DOSE 1	4	0.8
DOSE 1+ 2	306	63.7
DOSE 1+ 2 +3	170	35.4
<b>Total</b>	<b>480</b>	<b>99.9</b>

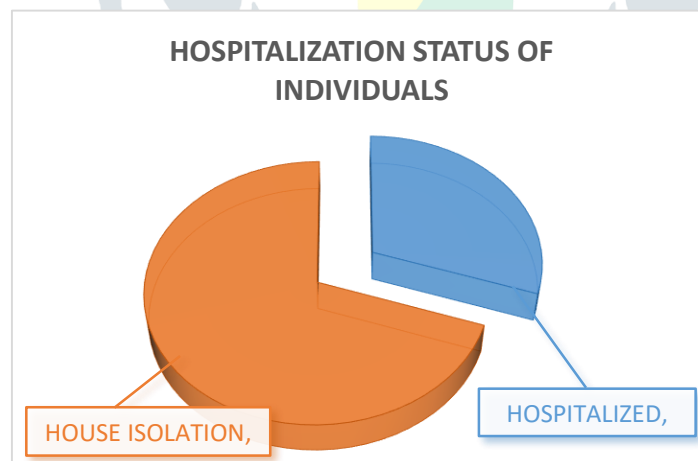
**Z=480**

The two-tailed P value is less than **0.0001**

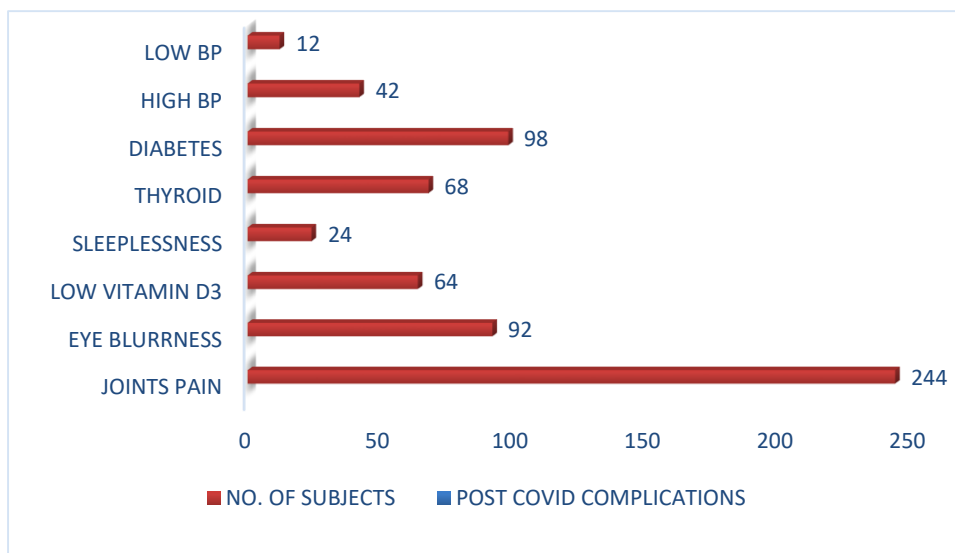
By conventional criteria, this difference is considered to be extremely statistically significant.

**GRAPH NO: 02**

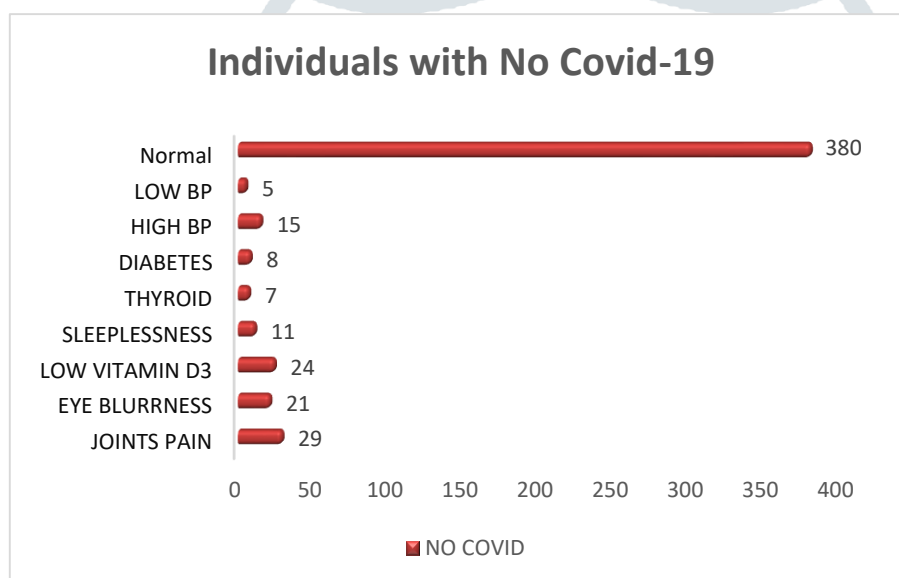
Pie chart showing vaccination status percentage of Covid-19 survivors enrolled in the study.

**GRAPH NO: 03**

Showing Pie chart with Hospitalization & House Isolation status of Covid-19 survivors enrolled in the study.

**GRAPH NO: 04**

Showing graph with different health issues triggered after two years of Covid-19 infection data of 480 Covid-19 survivors enrolled in the study.

**GRAPH NO: 05**

Showing graph with different health issues triggered after two years of Non-Covid-19 individuals out of 500 Non-Covid-19 individuals enrolled in the study.

**4. RESULT:**

A total of **980** individual enrolled in the study, **500** are Non Covid-19 and **480** are Covid-19 survivors with (42.3% Females & 57.7% Male with 'p' value of <math><0.001</math> two tailed) out of these **480** individuals **335** are Non-hospitalized (House Isolated) patients (69.8%), and **145** are hospitalized (30.2%) under medical supervision were included. 64.58% of Covid-19 survivors belongs to age group (18-40 years) and 35.41% belongs to (41-80 years). As per vaccination status of individuals registered under this study out of 480, two doses received by (63.7%). Third booster dose was received by (35.4%) and only (0.8%) was taken single dose only. Age group



(41-80 Years) have shown maximum health issues after Covid-19 infection and these effects are more adverse after vaccination in the same age group, it may be due to age dependent decrease in immune response. Joints pain is the more prevalent issue to both Hospitalized & Non-hospitalized patients out of **480** individuals **244** reported the same issue (244, 50.8% with  $P < .001$ ), whereas (Hyperglycaemia in 15.8%) and (Hypertension in 8.7%) was triggered among hospitalized patients (98 [15.8%] vs 42 [8.7%];  $P = .001$ ). Sleeplessness was reported in (13.95%) individuals. In female population 14.6% reported Thyroid issue after Covid-19 infection & Vaccination. However, the burden of symptomatic sequelae remained fairly high. Covid-19 survivors had a remarkably lower health status than the general population after 2 years. The study outcome point to that there is an crucial need to explore the pathogenesis of long COVID and develop effective interventions to reduce the risk of long COVID especially in younger age group.

## 5. Conclusions:

This case control study includes the ongoing health problems are sometimes define with different synonyms like post-COVID-19 syndrome, post-COVID conditions, long COVID-19, long-haul COVID-19, and post-acute-squeal of SARS COV-2 infection (PASC). It is quite complicated to correlate these health issues as side effects of vaccination or it is due to Covid-19 infection, because large proportion of vaccinated individuals with double dose and booster dose are facing different health issues after two years of Covid-19 exposure. This knowledge will also be highly pertinent for future pandemics and for analyzing the long-term effects of different viral infections like SARS COV-2 and the suspected vaccinations particularly those that gotten emergency use permission without undergoing strong clinical trials. However, the load of symptomatic sequelae lingered fairly high. Covid-19 survivors had a remarkably lower health status than the general population after 2 years. The study outcome point to that there is an crucial need to explore the pathogenesis of long COVID and develop effective interventions to reduce the risk of long COVID especially in younger age group. The findings provide valuable information about the dynamic trajectory of long-term health outcomes of COVID-19 survivors.

## 6. Acknowledgement:

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