Analyzing the Breakthrough of COVID-19 infection Incidence Rate, Severity and Mortality among the COVID-19 Vaccinated Population of West Bengal, India

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Method Article

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Abstract

World is facing the pandemicity of COVID 19. There are various types of mutations occurring in the genomics of SARS-Cov 2. COVID 19 vaccination has been already started. Common Vaccines are Pfizer, Moderna, Jassen, Sinovac, Covidshield, Covaxin, Sputnik V. In India, Covidshield and Covaxin have been majorly administered. Some people have taken Sputnik V also. We have proposed a Protocol of Analyzing the Breakthrough of COVID 19 infection Incidence Rate, Severity and Mortality among the COVID 19 Vaccinated Population of West Bengal, India and a State of the Art Systematic Review on using mask as a preventive measure against COVID 19 pandemic. This study will help to analyze the vaccine effectiveness and duration of effectiveness among the population of West Bengal. The systematic analysis of using mask will give a broader picture towards protective measures against COVID 19

Introduction

Since March 2020, the worldwide COVID-19 epidemic has been ongoing. [1] As a result of the epidemic, the globe is in the middle of a public health catastrophe. COVID-19, which is caused by the new SARS-CoV-2, has a zoonotic origin, which helps to clarify what might have been the disease's proximal beginnings in humans. [2] Upto, 4th February 2022, 388,982,520 patients are affected by SARS-Cov 2 globally, in which 5733116 patients died and 308275919 patients have recovered. [3] By this date, India has 41952712 cases, in which 500087 patients have died and 40017088 patients have recovered.[4] Globally, Vaccination has been started. Pfizer, Moderna, COVIDShield-Astrazeneca, Covaxin, Jassen, Sinovac, Sputnik are different types of COVID 19 vaccines. In India, free Vaccine Roll out has been started since 16th January, 2021.[5] In India, mainly two types of vaccine are given, they are COVIDShield and COVAXIN. In few, Sputnik and Pfizer vaccine were also given.

COVIDShield is a vaccine, manufactured by Serum Institute of India and COVAXIN is manufactured by Bharat Biotech.[5] Overall estimated Covidshield vaccination efficacy was 74.0 percent (95 percent confidence interval [CI], 65.3 to 80.5; P0.001), and estimated vaccine efficacy in persons 65 and older was 83.5 percent (95 percent CI, 54.2 to 94.1). [6] COVAXIN effectiveness against COVID-19 of any severity was 78 percent 14 days or longer after dose 2. Vaccines have a 93% effectiveness rate against serious illness. The effectiveness rate was 79 percent in persons under the age of 60, and 68 percent in those 60 and over. [7] Except for Oxford-AstraZeneca (81 percent), most of the common vaccinations exhibited effectiveness >90 percent (Pfizer-BioNTech (95 percent), Moderna (94 percent), and Sputnik V (92 percent). [8]

In 2020 Nov,we had published our study on Acceptance and Affordability of COVID 19 vaccine in a population of West Bengal. There we have found majority of the population want a COVID 19 vaccine in West Bengal. [9] Till 4th February 2022, 1684716068 people got COVID 19 Vaccine. [10] By 3rd Feb, 2022,

12,33,24,137 West Bengal people have got their vaccination. 6,64,87,391 people of 18+ age have got their first dose and 5,26,10,243 People of 18+ age have got their second doses. 30,01,307 of 15-18 years have got their first dose and 1,57,980 have got their second dose. 10,67,216 people have got their precaution booster dose. [10]

From March 22nd to July 27th, 2020, a consistent study of Covid-19-related factors such as total positive cases, death cases, active cases, population density, GDP, and so on for all South Asian countries hinted at a critical finding: the correlation between these factors was strongly dependent on time. [11]

Reagents

A detail Questionnaire to conduct the online survey in the population of West Bengal, Questionnaire is present in the supplementary file.

Language of the questionnaire: English

Equipment

A Detail Questionnaire [Supplement]. The Questionnaire will be distributed digitally with the help of Google Form.

Procedure

Study Design: Observational Prospective Cross-sectional Study

Research Design: Qualitative and Quantitative

Primary Data type: Digital Survey

Secondary data Collections: Journals, Books, Various online available literatures

Study Location: West Bengal is on the eastern bottleneck of India, stretching from the Himalayas in the north to the Bay of Bengal in the south. It lies between 85 degree 50 minutes and 89 degree 50 minutes east longitude, and 21 degrees 25 minutes and 27 degrees 13 minutes north latitude. Population: 10.19 Crore.

Study and Questionnaire Language: English

Data Management and analysis: Data will be taken in the google form and will be stored in the excel file. The whole survey will be done in the digital format. The statistician will calculate the correlative measurements on the incidence rate, severity and mortality of breakthrough COVID19 infections. The aim and research questions are highlighted below.

Aim of This Research and Research Questions:

1. How many People are getting COVID 19 Positive result after first dose?
2. How many people are getting COVID 19 Positive result after Second dose?
3. How many People are getting COVID 19 Positive result after Precautions Dose?
4. Duration between Jab and Disease Symptom appearance?
5. Gender Based Analysis.
6. Second wave and Third Waves in West Bengal will be included?
7. Vaccine Immunity Vs Natural Immunity?
8. Comparative measures between COVAXIN and CovidShield ?
9. Delta Variant and Omicron Variant will be included ?
10. Comorbidity Analysis
11. Population will be only within West Bengal
12. Duration: 2 months

Tentative Study duration: 12th February to 15th April, 2022

[The duration of the study can be increased w.r.t targeted population]

Plan of the study:

We will conduct a digital survey based on the given questionnaire. Followed by we will analyze the data of breakthrough COVID 19 infections incidence, severity and mortality. The survey will be done among the population of West Bengal. We will make a comparative analysis between the vaccines and we will find the answer of the above research questions.

Troubleshooting

1. Its a digital survey based study, so its hard to reach towards those population who don't have a smart phone or internet.
2. The questions will be in English, so we will be unable to reach towards those people who don't know English
3. Less man power
4. No funding available for this project
5. The study will be done in the West Bengal, So the gene pool variation will be less.

Time Taken

2 Months: 12th February to 15th April, 2022

Anticipated Results

- a. This study will help us to estimate the breakthrough infections in West Bengal
- b. This study will help us to know the severity and mortality of the break through infections.
- c. This study will help us to see the vaccine efficacy and a comparative analysis between Covaxin, Covidshield and Sputnik V
- d. This study will help the guidelines maker to make a more effective guidelines and jab time of the COVID vaccines.

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Figures

Figure 1

West Bengal COVID 19 Vaccination Status. Date 3rd Feb, 2022 [10]

[Made with Biorender]

Figure 2

Location of West Bengal

Figure 3

Flow of Work

Supplementary Files

This is a list of supplementary files associated with this preprint. Click to download.

- [SupplementaryFileofthePostVaccinationStudy.docx](#)