IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Human Journals
Review Article
May 2021 Vol.:21, Issue:2

Covid-19 Vaccine: Status and Challenges in India

IJPPR
INTERNATIONAL JOURNAL OF PHARMACY & PHARMACEUTICAL RESEARCH
An official Publication of Human Journals
ISSN 2349-7203
HUMAN

Sargun Singh*[1], Angad Singh[2], Anmol Chhabra[3], Kawaljit Kaur[4]

[1]Armaan Hospital, Jalandhar, India.
[2]Fresh Breath Dental Clinic, Jalandhar, India.
[3]Student, Baylor University, Waco Texas, US.
[4]MGK College, Kartarpur (Jalandhar), India.

Submitted: 25 April 2021
Accepted: 02 May 2021
Published: 30 May 2021

HUMAN JOURNALS
www.ijppr.humanjournals.com

Keywords: Covid-19, vaccination, Pfizer, Covaxine, Covishield, Serum Institute of India, Pandemic

ABSTRACT

India leads the world in the daily average number of new deaths reported, accounting for one in every 3 deaths reported worldwide each day. There have been 22,662,575 infections and 246,116 coronavirus-related deaths reported in the country since the pandemic began. Vaccination against this dreadful virus is the only way out. Hundreds of Covid-19 vaccines are in development right now. Some have produced very positive results in clinical trials and are now approved for the current vaccination drive world over. In India, Covaxine and Covishield are currently being administered for the jab. India surpasses the U.S. to become the fastest vaccinating country in total number of doses administered in the world but being a populous country, faces so many problems. Lack of confidence in vaccines due to their quick manufacturing, technical glitches at registration, side effect reports, insufficient staff at vaccination centers, and shortage of vaccines are some of the challenges that are being faced by the country. It is the responsibility of the administration to look at various angles and fasten the drive of vaccination clearing all the hurdles, as it is the utmost need in the current pandemic scenario.

BACKGROUND

Corona pandemic (Covid-19), a deadly infectious disease has badly gripped the world. On 11 March 2020, when WHO declared the Covid-19 outbreak as a pandemic, also reiterated the call for countries to take immediate actions and scale up the response to treat, detect and reduce transmission to save people's lives. Delegates who attended the 73rd World Health Assembly (WHA) held in Geneva last year on 18th-19th May, 2020, called for the intensification of efforts to control the pandemic, and for equitable access to and fair distribution of all essential health technologies and products to combat the virus. [1] As per WORLDOMETER, which is a reference website that provides counters and real-time statistics for diverse topics, 3,216,711 people have died so far from the Covid-19 outbreak as of May 03, 2021, 07:24 GMT. [2] India leads the world in the daily average number of new deaths reported, accounting for one in every 3 deaths reported worldwide each day. There have been 22,662,575 infections and 246,116 coronavirus-related deaths reported in the country since the pandemic began. [3]

Since the emergence of Corona and the realization of its severity and consequences as massive loss of human lives, the scientists across world have been working very hard to come to some instant solution. Being a new type of virus, there was no existing vaccine to fight against it that made the scientists and medical fraternity throughout the world to intensify the stir. The biggest challenge was to study its genome and then prepare a vaccine for it. The job that takes years to get accomplished was made to happen in a few months.

There are hundreds of Covid-19 vaccines in development right now, and some have produced very positive results in phase III clinical trials. Pfizer-BioNTech has got approval from FDA for emergency use in the U.S. It is recommended for anyone age 16 or above and trials for as young as 6 months are in progress. A CDC study has proved its efficacy in 90 percent of cases. [4] However, its storage is a big issue. It needs to be store at -70°C to -80°C. There are other vaccines too that have gotten approvals from different agencies. India can go with vaccines that require storage and transport in liquid form (that is, between 4°C and 10° C) and not the ones that have to be kept frozen. India has been a manufacturing hub for vaccines even before the pandemic. Vaccines made in India are easier to transport and are cheaper, putting the country in a better position than the U.S. and Europe when it comes to meeting demand in the developing world.

VACCINATION DRIVE IN WORLD

The United Kingdom was the first country to administer a fully tested Covid-19 vaccine, manufactured by Pfizer/BioNTech. As per data available from Our World in Data, on 20 April 2021, only 2.7 percent of the world population was fully vaccinated. The U.S. with 26 percent, the United Kingdom with 15.2 percent, Israel tops with 55.1 percent of the population who have been given a complete dose of the vaccination whereas, 1.3 percent of the Indian population was fully vaccinated. [5].

As per the latest figures, the U.S. tops the world with more than 16 crore Covid-19 vaccine doses, followed by China with over 14 crores and India ranks third with more than 8 crore doses administered. Where, India surpassed Brazil in a total number of Covid-19 cases and stands at number two after the U.S. being the number one, parallel to it now India surpasses the U.S. to become the fastest vaccinating country in the world. [6].

VACCINATION STATUS IN INDIA

Covaxine and Covishield vaccines are already in the Indian market. Unlike the Pfizer-BioNTech or Moderna vaccines that require a minus 70-degree Celsius (cold) chain, the Indian vaccines need to be stored only at 2-8 degrees Celsius. Sputnik-V, a third Covid-19 vaccine has also been approved for use in India amid a deadly second wave of infections. Russia's Sputnik-V has been deemed safer and gives around 92% protection against Covid-19, late-stage trial results published in The Lancet revealed. In terms of efficacy, Sputnik-V outshines both Covishield and Covaxine compared to Covishield’s nearly 90% (global reports) and Covaxin’s 81% (interim third phase trial results) efficacy. [7]

CHALLENGES IN INDIA

In country like India that is a highly and thickly populated country, population count in itself is a big problem. India is a popular destination for medical tourists, given the relatively low costs and high quality of its private hospitals. Jalandhar city has emerged as Asia’s ‘biggest’ Medicare hub with over 800 super-specialty, multi-specialty centers, nursing homes, and clinics — the largest on a per capita basis as compared to any other city of Asia. Despite all this, there is a big disparity in urban and rural healthcare facilities. Healthcare policies at the government end are very poor. According to the World Health Organization in 2007, India ranked 184 out of 191 countries in the amount of public expenditure spent on healthcare out of total GDP.[8] Serum Institute of India (SII), an Indian biotechnology and pharmaceutical

company is the world's largest vaccine manufacturer. It is currently making Covid-19 vaccines under license for pharmaceutical firms such as AstraZeneca.[9] Despite all this standing, India is right now battling badly with the Covid-19 pandemic. In vaccination drive, the following are some of the issues that are slowing down its pace.

1. Vaccine Hesitancy

The covid-19 vaccine was made available for the people in government and private hospitals in Mid- January. In government hospitals, it is offered free of cost whereas, in private centers, the candidate has to pay as per rates finalized by the government/hospitals. In the initial phase, the response of the public was lukewarm. Still, a huge percentage of people hesitate to get vaccinated for several reasons. These may be as follows;

i. Quick development

In normal circumstances, vaccine development takes so many years to come up in the open market for human use. Several manufacturers have successfully developed Covid-19 vaccines in less than 12 months—an extraordinary achievement, given it typically takes a decade or longer to develop new vaccines.[10-13] As of 3rd Feb 2021, there were 289 experimental Covid-19 vaccines in development, 66 of which were in different phases of clinical testing. Pfizer, Moderna, AstraZeneca (Covishield), Covaxine and others, come in this category of 66. Therefore, people are skeptical about the efficacy of these vaccines.

ii. Side effect reports

It is common to experience some mild-to-moderate side effects when receiving vaccinations. These side effects are a good thing as they show us that the vaccine is working. In February this year, scientists in Europe have suspected a link between the vaccine and rare but recurring cases of fatal clots. Some countries have stopped using the vaccine, which is named Covishield in India. Sri Lanka has found six cases of blood clots among recipients of the AstraZeneca which is again the Covishield vaccine, three of whom have died, as per Reuter. [14] Such reports create fear among people.

iii. Recurrence of Covid-19 after vaccination

According to a report in the *Times of India*, King George Medical University Vice-Chancellor, Lt Prof. Bipin was re-infected after taking both doses of the Covid-19 vaccine. Similarly, Dr. Dhami, Director of Sanjay Gandhi Post Graduate Institute and Medical

Science, and his wife were tested Covid-19 positive after receiving both the doses of Covid-19 vaccine. There are other cases too. Yet medical fraternity vouch for vaccination as vaccinated people show mild effects of the disease. Recently, a Delhi surgeon Dr. Anil Kumar Rawat, who was fully vaccinated for Covid-19 in March, died of this virus and as per his last words while on a ventilator that he would be recovered as he has taken both Covid-19 jabs. Such shocking news further create uncertainty and doubts among the people. [15]

2. Cost-Effectiveness

Although Covid-19 jab is free in government hospitals, it is not the first choice of the majority of people. Because of lack of trust in the working conditions at Government centers especially when the second wave of Covid-19 is at its peak, all government hospitals are overloaded with pandemic burden, people avoid going there out of fear. In private hospitals, it is paid which was fixed at rupees 250 per dose for both Covaxine as well as Covishield initially. Recently, the Serum Institute of India (SII) hiked the price of its Covishield vaccine at Rupees 600 per dose for private hospitals and Rs 400 per dose for state governments [16]. On the same tunes, Covaxine prices are up at Rupees 600 for states and Rupees 1200 for private hospitals. [17] Although now both have reduced their prices for the states but so far, the cost stands the same for private hospitals.

3. Shortage of Vaccines

On one end, the administration and government are using all media platforms to convince the citizens of the country to go for vaccination, at the same time country is passing through a phase of vaccination crunch coupled with a full-blown second wave of Covid-19. Various vaccination centers have been made shut throughout the country due to the unavailability of vaccines. 70 out of 120 centers were shut in Mumbai alone. Similar was the status of other states also.[18] Now when the government has announced to vaccinate everyone above the age of 18 realizing the gravity of the disease, it could not be started on the due date at majority of the places due to vaccination hiccups at the government end. Moreover, the Centre’s decision to buy the vaccines directly from the manufacturers by the States and private hospitals has further halted the drive.

4. Lack of Sufficient Mobile and Internet Facilities

The online registration by the candidate is must before going for vaccination. People who do not have phones or internet facilities or are not acquainted with such techniques find it a difficult task. This also made them hesitant initially. From 1st May 2021, Government has allowed those above 18 years of age to get vaccinated but before that they need to get themselves registered. The Covid-19 site crashed due to rush for registration. This technical glitch left many people unregistered. [19]

5. Insufficient Medical and Para- Medical Staff at Vaccination Centers

At various vaccination centers, it has been observed that there is a shortage of medical as well as paramedical staff. In the current pandemic situation, most of the staff is busy attending the Covid-19 patients. Therefore, people are scared of the repercussion or any complication if occurs after vaccination in the condition of inadequate staff. Recently, National Medical Commission has issued instructions to all medical colleges and institutions to continue to utilize the services of final-year postgraduate students as resident doctors (MD and MS) until fresh batches of PG students join the institutions given the new admissions have been delayed in the current situation. [20]

Amidst the Covid-19 ‘tsunami’ at present, government and administrative authorities need to make a massive drive for vaccination and educate the people about it so that no chaos is created. At the same time, the government must intervene to lower the prices of the vaccines and not let the vaccine manufacturers decide about the same at their own. Because the skyrocket price hiking will further discourage the people from the weaker sections of the society from getting themselves vaccinated. In the current scenario, the focus must be on bringing herd immunity as early as possible, and to achieve the goal, vaccination should be made free at both government as well as private centers.

REFERENCES

1. IISD. May 26th, 2020. Countries Commit to Work Together to Combat COVID-19 at World Health Assembly. Available at; https://sdg.iisd.org/news/countries-commit-to-work-together-to-combat-covid-19-at-world-health-assembly/, retrieved on 3rd May, 2021 at 11 A.M.
2. WORLDOMETER. COVID-19 Corona Virus Pandemic. 3rd May 2021. Available at; https://www.worldometers.info/coronavirus/, retrieved on 3rd May, 2021 at 10.40 A.M.
3. REUTER. 10 May 2021. India COVID cases hold close to record highs as calls widen for national lockdown. Available at; https://graphics.reuters.com/world-coronavirus-tracker-and-maps/countries-and-territories/india/, retrieved on 10th May 2021 at 6 P.M.

4. Thompson MG, Burgess JL, Naleway AL, Tyner HL, Yoon SK, Meece J, Olsho LEW, Caban-Martinez AJ, Fowlkes A, Lutrick K, Kuntz JL, Dunnigan K, Odean MJ, Hegmann KT, Stefanski E, Edwards LJ, Schaefer-Solle, Grant L, Ellingson K, Groom HC, ZunieT, Thiese MS, Ivacic L, Wesley MG, Lamberte JM, Sun X, Smith ME, Phillips AL, Groover KD, Yoo YM, Gerald J, Brown RT, Herring MK, Joseph G, Beitel S, Morrill TC, Mak J, Rivers P, Harris KM, Hunt DR, Arvay ML, Kutty P, Fry AM, Gaglani M. Interim Estimates of Vaccine Effectiveness of BNT162b2 and mRNA-1273 COVID-19 Vaccines in Preventing SARS-CoV-2 Infection Among Health Care Personnel, First Responders, and Other Essential and Frontline Workers — Eight U.S. Locations, December 2020–March 2021. CDC. Morbidity and Mortality Weekly Report (MMWR), 2nd April 2021. Available at;https://www.cdc.gov/mmwr/volumes/70/wr/mm7013e3.htm?s_cid=mm7013e3_w#contribAff, retrieved on 1st May 2021 at 12.30 P.M.

5. OUR WORLD IN DATA. Statistics and Research: Coronavirus (Covid-19) Vaccinations. Available at; https://github.com/owid/covid19data/blob/master/public/data/vaccinations/country_data/Israel.csv, retrieved on 21st April 2021 at 9.50. A.M.

6. TIMES OF INDIA, 7th April 2021: available at; https://timesofindia.indiatimes.com/india/with-more-than-30-lakh-jabs-a-day-india-becomes-fastest-country-to-vaccinate-against-covid-19/articleshow/81948250.cms#:~:text=As%20per%20the%20latest%20figures,than%208%20crore%20doses%20administered, retrieved on 21st April 2021 at 10.21. A.M.

7. Logunov DY, Dolzhikova IV, Shcheblyakov DV, Tukhvatulin AI, Zubkova OV, Dzharullaeva AS, Kovyrshina AV, Lubenets NL, Grousova DM, Erokhova AS, Botikov AG, Izhaeva FM, Popova O, Ozharovskaya TA, Esmagambetov IB, Favorskaya IA, Zrelkin DI, Voronina DV, Shcherbinin DN, Semikhin AS, Simakova YV, Tokarskaya EA, Egorova DA, Shmarov MM, Nikitenko NA, Gushchin VA, Smolyarchuk EA, Zyryanov SK, Borisevich SV, Naroditsky BS, Gintsburg AL, and the Gam-COVID-Vac Vaccine Trial Group. Safety and efficacy of an rAd26 and rAd5 vector-based heterologous prime-boost COVID-19 vaccine: an interim analysis of a randomized controlled phase 3 trial in Russia. Lancet 2021; 397: 671–81

8. Bhardwaj G, Monga A, Shende K, Kasat S, Rawat S. "Healthcare At the Bottom of the Pyramid An Assessment of Mass Health Insurance Schemes in India". Journal of the Insurance Institute of India. 2014; 1 (4): 10–22.

9. BBC News (Robertson C). February 28, 2021.Covid: How this Indian firm is vaccinating the world. Available at; https://www.bbc.com/news/business-56218058, retrieved on 8th May 2021; retrieved on 2nd May 2021 at 11 P.M.

10. Hanney SR, Wooding S, Sussex J, Grant J. From COVID-19 research to vaccine application: why might it take 17 months not 17 years and what are the wider lessons? Health Res Policy Sys 2020; 18: 61.

11. Pronker ES, Weenen TC, Commandeur H, Claassen EHJHM, Osterhaus ADME. Risk in vaccine research and development quantified. PLoS One 2013; 8: e57755.

12.Davis MM, Butchart AT, Wheeler JRC, Coleman MS, Singer DC, Freed GL. Failure-to-success ratios, transition probabilities and phase lengths for prophylactic vaccines versus other pharmaceuticals in the development pipeline. Vaccine 2011; 29: 9414–16.

13. Struck MM. Vaccine R&D success rates and development times. Nat Biotechnol 1996; 14: 591–93.

14. REUTER. 21 April 2021. India: Sri Lanka reports six cases of blood clots among AstraZeneca vaccine recipients, 3 dead. Available at; https://www.reuters.com/world/india/sri-lanka-reports-six-cases-blood-clots-among-astrazeneca-vaccine-recipients-3-2021-04-21/, retrieved on 22nd April 2021 at 11.30 A.M.

15. THE INDIAN EXPRESS (Patel S). 9th May 2021. Delhi surgeon who got second Covid vaccine in March dies of virus. Available at; https://indianexpress.com/article/cities/delhi/delhi-surgeon-who-got-second-covid-vaccine-in-march-dies-of-virus-7307387/, retrieved on 13th May 2021 at 2.15 P.M.

16. INDIA TODAY (Sharma M). 21st April. 2021. Serum Institute fixes Covishield price at Rs 600/dose for private hospitals, Rs 400 for State Govts. Available at; https://www.indiatoday.in/coronavirus-outbreak/story/serum-institute-fixes-covishield-price-at-rs-600-for-pvt-hospitals-rs-400-for-state-govts-1793389-2021-04-21, retrieved on 25th April 2021 at 1.30. P.M.

17. TIMES OF INDIA (Bharadwaj S and Mekherjee R). 25th April 2021. Covid-19 vaccine: Covaxin priced at Rs 600 for states, Rs 1200 for private hospitals. Available at; https://timesofindia.indiatimes.com/india/covaxin-to-cost-

rs-600-for-states-rs-1200-for-private-hospitals-says-bharat-biotech/articleshow/82234371.cms, retrieved on 25th April, 2021 at 12.18 P.M.
18. THE ECONOMIC TIMES. 9th April 2021. COVID vaccination: 70 out of 120 centres shut in Mumbai reportedly due to vaccine shortage. Available at; https://economictimes.indiatimes.com/news/india/covid-vaccination-70-out-of-120-centres-shut-in-mumbai-reportedly-due-to-vaccine-shortage/videoshow/81989365.cms, retrieved on 24th April 2021 at 7.30 P.M.
19. THE ASIAN AGE. (Pandey V). 29th April 2021. Covid-19 website crashes. Available at; https://www.asianage.com/india/all-india/290421/covid-19-vaccine-website-crashes.html, retrieved on 29th April, 2021 at 7 P.M.
20. TRIBUNE NEWS SERVICE. 28th April 2012. Final-yr PG students to continue working as resident doctors. Available at; https://www.tribuneindia.com/news/punjab/final-yr-pg-students-to-continue-working-as-resident-doctors-245723, retrieved on 29th April, 2021 at 11 P.M.