

## **Covid-19 Vaccine in India: The Best Vaccine is What You Can Get**

**Sanjith Saseedharan<sup>1</sup> and Shalaka Patil<sup>2\*</sup>**

<sup>1</sup>*HOD Critical Care, S.L. Raheja Hospital, India*

<sup>2</sup>*ICU Registrar, S.L. Raheja Hospital, India*

**\*Corresponding Author:** Shalaka Patil, ICU Registrar, S.L. Raheja Hospital, India.

**Received:** June 08, 2021; **Published:** June 23, 2021

### **Abstract**

As on 26<sup>th</sup> May India has had twenty-seven million, eight hundred and ninety-five thousand eight hundred cases with 32 lakhs deaths. India currently has the largest number of confirmed cases in Asia and the second-highest number of confirmed cases in the world (after the United States). Without a vaccine against SARS-CoV-2, the coronavirus that causes COVID-19, there will always be a risk of new outbreaks and new surges of the disease. The Indian authorities have authorized the British Oxford-AstraZeneca vaccine (Covishield), the Indian BBV152 (Covaxin) vaccine, and the Russian Sputnik V vaccine for emergency use. The interval between two doses recommended are, up to 12 weeks with Covishield, 4 to 6 weeks with Covaxin and 28 days for the Sputnik V vaccine. Covaxin demonstrated 78% vaccine efficacy against mild, moderate, and severe COVID-19 disease where the corresponding figure for Covishield is around 70% and for Sputnik V it is a little over 90%. Each of these vaccines were tested in different time periods, where the variants of Sars Cov2 were different leading to a different form of infection, transmission and severity. This means if a candidate vaccine was tested in a population with highly resistant variants the efficacy would be reduced. Hence, unless a head-to-head comparison between vaccines have been done these efficacy figures do not distinguish potency between these vaccines. The best vaccine is what you get!!!

**Keywords:** SARS-CoV-2; COVID-19; Covishield; Covaxin; Vaccine

### **Introduction**

As on 26<sup>th</sup> May India has had twenty-seven million, eight hundred and ninety-five thousand eight hundred cases with 32 lakhs deaths [1]. The first case of COVID-19 in India, which originated from China, was reported on 27<sup>th</sup> January 2020 [2]. India currently has the largest number of confirmed cases in Asia and the second-highest number of confirmed cases in the world (after the United States).

There has been great technological progress by the humankind in the last century.

However, the greatest achievement mankind has ever had is the eradication of smallpox, near removal of polio from the face of the earth and reduction of the impact of measles. This was all possible because of vaccines in the prevention and progress of this disease [3]. This has prevented 2 - 3 million deaths annually. As COVID-19 continues to strike and kill thousands of people around the world, we all are wondering how do we get out of this. The big question is how and when will we get back to normal life. The only guarantee is that this won't be simple.

Without a vaccine against SARS-CoV-2, the coronavirus that causes COVID-19, there will always be a risk of new outbreaks and new surges of the disease [4].

---

**Citation:** Sanjith Saseedharan and Shalaka Patil. "Covid-19 Vaccine in India: The Best Vaccine is What You Can Get". *EC Emergency Medicine and Critical Care* 5.7 (2021): 38-41.

We can control the spread COVID-19 by testing, tracing and quarantining but the only way to significantly reduce the threat would be to ensure that a significant number of people (approximately 67% of the total population) are immune and not by the ephemeral short-lasting immunity given by a natural infection but a durable, long lasting and strong immunity given by a vaccine [3].

Hence vaccines are the most potent weapons that will end this epidemic.

The Indian authorities have authorized the British Oxford-AstraZeneca vaccine (Covishield), the Indian BBV152 (Covaxin) vaccine, and the Russian Sputnik V vaccine for emergency use [5].

### How are these vaccines designed?

With the advances in molecular biology and vaccinology wide range of vaccine platforms have been designed to protect against viral diseases that would be either component vaccines or a whole vaccine. The component vaccine would involve a protein subunit, or virus-like particles (VLPs), DNA or an RNA based genetic material from the pathogen, or a nonreplicating viral vector or a replicating viral vector). The whole vaccine would either a live attenuated weakened virus or an inactivated killed pathogen that cannot replicate [3].

The Covishield is the nonreplicating viral vector vaccine and the Covaxin is the whole virion inactivated Vero cell vaccine. Both the vaccines would require two doses. Similarly, to Covishield, the Sputnik V is also an adenoviral vector vaccine but the two jabs are different which are not interchangeable. All these vaccines have completed phase 1 and phase2 trials while the Covishield has completed the phase 3 in UK and the bridging trial in India [6-8].

The interval between two doses recommended are, up to 12 weeks with Covishield, 4 to 6 weeks with Covaxin and 28 days for the Sputnik V vaccine [6-8].

### How do they work?

These vaccines produce a T cell response. We have some soldiers in our body called CD4+ and CD8+ cells. The CD4+ cells would stimulate the B cells to make antibodies and the CD 8 + cells are the ones that kill the cells infected with the virus and thus would contribute to the end of this pandemic [9].

Never in the history of preventive science has there been so much of frantic pace to produce a vaccine. Needless to say, there are over 121 vaccine candidates in the preclinical phase and over 116 in the clinical phase of trials. Only 17 vaccines have been approved by at least 1 country [5].

### How many vaccine doses does India require to end this pandemic?

Starting 1<sup>st</sup> May 2021, everyone above the age of 18 are eligible to get the vaccine in India. Our population stands around 137 crores and as of 15<sup>th</sup> May around 9.1% have received some vaccine (at least the first dose) and only around 2% are completely vaccinated (received two doses and completed the schedule) [1,5]. Almost 2.5 million people are being vaccinated per day [5]. The Serum Institute of India that makes the Covishield has the capacity to make 100 million doses per month and Covaxin around 50 - 60 million doses per month [10]. This means, at best only 7.5 crores will get completely vaccinated at 1 month and we have 137 crores population. Even if we want to vaccinate 100 crores, we would likely require at least 18 months. So obviously it looks like Covid is to stay for a while and yes there is a vaccine shortage unless other approved vaccines get approvals and authorization for use in India. This is one of the reasons that delaying the shot (for Covishield only) by a couple of weeks may be of some benefit. At least a larger population may get at least the 1<sup>st</sup> dose of the vaccine. There are studies to say that delaying the shot may be also beneficial [11]. So, the plan to move the 2<sup>nd</sup> dose away for 84 days does by the Indian authorities does not seem to be very wrong. This will ease out the technical and operational feasibility in delivering the vaccine to a larger population.

India is considered the vaccine capital of the world contributing to 60% of the world's supply. The Indian government is planning to ramp up the production and supply of vaccines by the end of 2021.

### **Efficacy and safety**

All vaccines are cleared for use only after two major issues are verified. This includes safety and efficacy. The authorization to administer the vaccine is done after examining all available clinical trials in this regard. What is clear is that the vaccine is very safe and a good immune response may be achieved only after 4 weeks of the second dose of the vaccine.

In a trial which included 25800 participants [5], Covaxin demonstrated 78% vaccine efficacy against mild, moderate, and severe COVID-19 disease [7] where the corresponding figure for Covishield is around 70% and for Sputnik V it is a little over 90% [6,7,9]. 90% efficacy means that among those individuals who got the vaccine they were 90% less likely to get covid. It does not mean that if 100 get the vaccine then 10 of them will get sick [5-8].

These figures give us a feeling that either one of the vaccines is better than the other or alternatively it means that there was never a fair comparison.

First of all, how have these efficacy figures arrived. These figures are a result of Randomized control trial (RCT). In a RCTs, the study participants are randomly assigned into two comparable groups. In one, the experimental group, the actual vaccine is administered. The other, the control group, gets a placebo - a neutral, unharmed substance that is not a vaccine. The process takes place in optimal, controlled, similar (for both experimental and control groups) conditions. Importantly each of these vaccines were tested in different time periods, where the variants of Sars Cov2 were different leading to a different form of infection, transmission and severity. This means if a candidate vaccine was tested in a population with highly resistant variants the efficacy would be reduced. Hence, unless a head-to-head comparison between vaccines have been done these efficacy figures do not distinguish potency between these vaccines.

Well, what is more important for us to understand is that any vaccine that has more than a 50% efficacy does the job [3]. The goal of COVID-19 vaccines is not to eliminate the virus, but to remove its ability to cause serious hospitalization and death and all the candidate vaccine seems to be doing that. So, which is the best vaccine: The best vaccine is what you get!!!

Studies have also shown these to be also effective against the UK variant, double mutant and the Brazilian variant albeit a little lower [12]. These are studies of serum taken from patients who were vaccinated or exposed to Sars Cov2 depicting a reduced susceptibility of the new variants to the antibodies generated. However, what is important to understand is that the experiments in serum cannot be a good guide to understand whether variants can evade immunity generated from vaccines in real world settings in the human body [9]. Importantly the T-cells function against the virus still exists and is not tested. So, the dip in potency or effectiveness as mentioned in these laboratory studies may not be significant. In short, the vaccine will still prevent a severe disease.

Something more important in the vaccine space is the horizon. Both the companies would be coming up with an intranasal variant which would probably be a game changer due to scalability and the fact that "like oral polio vaccine" non healthcare personnel can be used to deliver this vaccine. This route may have a high compliance and may also prevent the transmission apart from infection.

### **Is there any evidence in India that the vaccines are effective?**

There does not seem to be any doubt about this. The latest data on breakthrough infections of Covid-19 has showed that 23,940 people in India got the infection after taking both shots of Covaxin -- 0.13 per cent of the total population vaccinated so far.<sup>9</sup> So it does appear that vaccines are doing their job.

The covishield costs Rs 300 for state governments and at Rs 600 for private hospitals. The covaxin stands at Rs 400 for the state government and Rs 1,200 in private hospitals [4,7,13]. While the Sputnik V would be priced at Rs 1,250 (including the administration charges).

### Conclusion

Getting a vaccine is a personal choice, but it is important to understand that stopping the pandemic will require you to take the jab and thus, you taking the vaccine will help a larger cause. A short period of discomfort is whole lot better than getting hospitalized or worse landing up in the intensive care unit. The development, approval and rollout of safe and effective vaccines against SARS-CoV-2 is cause for celebration and provides a glimmer of hope that the end of the global pandemic could be within grasp.

### Bibliography

1. Coronavirus case tracker India (2021).
2. Andrews MA., *et al.* "First confirmed case of COVID-19 infection in India: A case report". *Indian Journal of Medical Research* 151.5 (2020): 490-492.
3. Frederiksen LSF, *et al.* "The Long Road Toward COVID-19 Herd Immunity: Vaccine Platform Technologies and Mass Immunization Strategies". *Frontiers in Immunology* 11 (2020): 1817.
4. Thiagarajan K. "Why is India having a covid-19 surge?" *BMJ* 373 (2021): n1124.
5. Coronavirus Vaccine Tracker (2021).
6. Thiagarajan K. "What do we know about India's Covaxin vaccine? In The BMJ BMJ Publishing Group 373 (2021).
7. Lawton G. "Sputnik V vaccine goes global". *New Scientist* 250.3331 (2021): 10-11.
8. Doroftei B., *et al.* "Mini-Review Discussing the Reliability and Efficiency of COVID-19 Vaccines". *Diagnostics* 11.4 (2021): 579.
9. Jeyanathan M., *et al.* "Immunological considerations for COVID-19 vaccine strategies". *Nature Reviews Immunology* 20.10 (2020): 615-632.
10. Wikipedia contributors. COVID-19 vaccination in India. Wikipedia, The Free Encyclopedia 1.15 (2021): 45.
11. Wise J. "CoviD-19: New data on oxford AstraZeneca vaccine backs 12 week dosing interval". In *The BMJ* 372 (2021).
12. Sapkal GN., *et al.* "Inactivated COVID-19 vaccine BBV152/COVAXIN effectively neutralizes recently emerged B.1.1.7 variant of SARS-CoV-2". *Journal of Travel Medicine* 4 (2021): 1-3.
13. Thiagarajan K. "Covid-19: India is at centre of global vaccine manufacturing, but opacity threatens public trust". In *The BMJ* 372 (2021).

### Volume 5 Issue 7 July 2021

©All rights reserved by Sanjith Saseedharan and Shalaka Patil.