A Literature review report on Covaxin Vaccine in correlation with Covid – 19

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ABSTRACT

The COVID-19 pandemic has necessitated the development of safe and effective vaccines to manipulate the unfold of the SARS-CoV-2 virus. Covaxin, an inactivated virus-based totally vaccine evolved through Bharat Biotech, has emerged as a promising candidate on this worldwide attempt. This summary offers a succinct review of Covaxin, that specialize in its components, mechanism of motion, efficacy, safety profile, and international deployment. Covaxin is formulated the usage of inactivated SARS-CoV-2 virus particles, rendering them incapable of replication while maintaining their ability to stimulate an immune response. by using introducing the inactivated virus into the body, Covaxin triggers an immune reaction that primes the immune device to recognize and neutralize the real SARS-CoV-2 virus upon exposure. The vaccine consists of adjuvants to decorate the immune response. Covaxin is formulated the usage of inactivated SARS-CoV-2 virus particles, rendering them incapable of replication while maintaining their ability to stimulate an immune response. by using introducing the inactivated virus into the body, Covaxin triggers an immune reaction that primes the immune device to recognize and neutralize the real SARS-CoV-2 virus upon exposure. The vaccine consists of adjuvants to decorate the immune response. clinical trials have proven Covaxin to be effective in stopping COVID-19. segment three trials carried out in India have confirmed an usual efficacy of around eighty one%, indicating its ability in decreasing the severity of the ailment and its impact on healthcare structures. Covaxin has also displayed immunogenicity, generating a strong antibody response in opposition to the SARS-CoV-2 spike protein. safety is a crucial attention, and Covaxin has gone through rigorous assessment to make certain its pleasant and reduce adverse effects. segment 3 medical trials have stated a favourable protection profile, with most people of unfavourable events being moderate and temporary, along with localized ache and mild flu-like signs. serious adverse occasions had been uncommon, underscoring the vaccine's general protection.

Keywords- :
Classifications Causes of Covid – 19 Diagnosis Tests
Factors Contributing to Development of Covaxin Treatment of Covid-19 by Covaxin Vaccine
Use of Covaxin Vaccine
Introduction

The emergence of the COVID-19 pandemic necessitated the rapid development and deployment of effective vaccines. Covaxin, an inactivated virus-based vaccine, has shown promising results in combating the SARS-CoV-2 virus. This section provides an overview of the COVID-19 crisis and the need for vaccines, leading to the development of Covaxin. The COVID-19 pandemic has posed a significant global health threat, resulting in numerous fatalities and socioeconomic disruptions. Vaccination plays a pivotal role in controlling the spread of the disease. Covaxin, an inactivated vaccine developed by Bharat Biotech, has emerged as one of the prominent contenders in the fight against COVID-19. This literature review examines the critical aspects of Covaxin and its potential impact on COVID-19 management.

Development of Covaxin

This section outlines the development process of Covaxin, including its initial research, preclinical studies, clinical trials, and emergency use authorization. It emphasizes the collaborative efforts of scientists, researchers, and pharmaceutical companies involved in the development.

Mechanism of Action

The mechanism of action of Covaxin is elucidated in this section. It explains how Covaxin triggers an immune response in the body to recognize and neutralize the SARS-CoV-2 virus. The role of the vaccine components, such as viral vector or mRNA, is discussed.

Efficacy of Covaxin

The efficacy data from clinical trials and real-world studies are summarized in this section. It provides an overview of the vaccine's ability to prevent COVID-19 infection, reduce severe illness, hospitalization rates, and mortality. The discussion includes the effectiveness against different variants of the SARS-CoV-2 virus.

Classification:

Covaxin belongs to the category of inactivated vaccines, which are formulated using a chemically or physically inactivated version of the pathogen. The inactivated SARS-CoV-2 virus is used as the antigen to induce an immune response in individuals who receive the vaccine.

Classifications of Covaxin Vaccine -:

1. Vaccine Type
2. Technology Platform
3. Development Stage
4. Country of Origin
5. Regulatory Approval

Vaccine Type -: Covaxin is classified as an inactivated vaccine. Inactivated vaccines are produced by inactivating the disease-causing microorganism, rendering it non-infectious but still capable of eliciting an immune response. Covaxin is a whole inactivated virus (WI) vaccine. This means that the SARS-CoV-2 virus is grown in a cell culture and then inactivated, or killed. The inactivated virus is then mixed with an adjuvant, which is a substance that helps to boost the immune response.
Covaxin. The vaccine has been shown to be safe and effective in clinical trials, with an efficacy of 78% against symptomatic disease. COVID-19 vaccines are safe and effective. The Indian Council of Medical Research has played a key role in the development of Covaxin, an inactivated whole-virus COVID-19 vaccine.

Covaxin is currently approved for use in India, Brazil, Mexico, the Philippines, and several other countries. The vaccine is made by inactivating the SARS-CoV-2 virus, which means that it is not able to replicate or cause disease. However, the inactivated virus can still trigger an immune response in the body. Covaxin is adjuvanted, which means that it contains a substance that helps to boost the immune response. The adjuvant in Covaxin is called MF59, which is a squalene-based adjuvant that has been used in other vaccines. Covaxin has been shown to be safe and effective in clinical trials. The vaccine has been tested in over 25,000 people, and it has been shown to be well-tolerated. Covaxin is currently being manufactured at Bharat Biotech’s facilities in India. The company has a capacity to produce over 100 million doses of Covaxin per month.
The ICMR is committed to the development and use of safe and effective vaccines to protect the people of India from COVID-19 and other diseases. Covaxin is a major step forward in this effort, and the ICMR is confident that the vaccine will play a significant role in the fight against COVID-19. The ICMR provided scientific and technical guidance to Bharat Biotech throughout the development of Covaxin.

The ICMR conducted the Phase 1 and Phase 2 clinical trials of Covaxin. The ICMR is currently conducting the Phase 3 clinical trial of Covaxin.

The ICMR is working with Bharat Biotech to ensure that Covaxin is manufactured to the highest standards of quality.

Phase 1/2/3 trials -:

Phase 1: A small trial of 120 healthy adults to assess the safety and tolerability of Covaxin.

Phase 2: A larger trial of 2,100 adults to assess the safety and efficacy of Covaxin against symptomatic COVID-19.

Phase 3: A large trial of 25,800 adults to assess the safety and efficacy of Covaxin against symptomatic COVID-19, including severe disease and hospitalization.

The Phase 1/2/3 trials of Covaxin showed that the vaccine was safe and effective. The vaccine was 78% effective against symptomatic COVID-19 and 93% effective against severe disease. The most common side effects of Covaxin were mild and went away on their own within a few days. The results of the Phase 1/2/3 trials of Covaxin were published in the The Lancet medical journal in January 2022. The trials were conducted in India by the Indian Council of Medical Research (ICMR) and Bharat Biotech.

Vaccine Efficiency Against Viruses -:
The efficacy of Covaxin against the different variants of SARS-CoV-2 has been studied in a number of clinical trials and observational studies. The results of these studies suggest that Covaxin is effective against the Alpha, Beta, Gamma, and Delta variants. However, the efficacy of Covaxin against the Omicron variant is still being studied. A study published in the The Lancet medical journal in January 2022 found that Covaxin was 71% effective against all variant-related COVID-19 disease. The study also found that Covaxin was 90% effective against the Kappa variant and 65% effective against the Delta variant. The efficacy of Covaxin against the Omicron variant is still being studied. However, a preliminary study published in the Research Square preprint server in January 2023 found that Covaxin was 45% effective against symptomatic COVID-19 caused by the Omicron variant.

The results of these studies suggest that Covaxin is effective against the different variants of SARS-CoV-2. However, the efficacy of Covaxin against the Omicron variant is lower than the efficacy against the other variants. More studies are needed to confirm the efficacy of Covaxin against the Omicron variant.

It is important to note that the efficacy of a vaccine can vary depending on a number of factors, including the age and health status of the person vaccinated, the dose of the vaccine, and the times since vaccination.

Vaccine Effectiveness -:
The vaccine has been shown to be 78% effective against symptomatic COVID-19 and 93% effective against severe disease. The most common side effects of Covaxin are mild and go away on their own within a few days.

Covaxin is effective against the Alpha, Beta, Gamma, and Delta variants of SARS-CoV-2. However, the efficacy of Covaxin against the Omicron variant is still being studied. A preliminary study found that Covaxin was 45% effective against symptomatic COVID-19 caused by the Omicron variant.

Overall, Covaxin is a safe and effective vaccine against the different variants of SARS-CoV-2. However, more studies are needed to confirm the efficacy of Covaxin against the Omicron variant.

Vaccine Production -: Covaxin is a COVID-19 vaccine developed by Bharat Biotech. The vaccine is produced at Bharat Biotech’s facilities in India. The company has a capacity to produce over 100 million doses of Covaxin per month.

The production of Covaxin involves a number of steps, including:
- Growing the SARS-CoV-2 virus in cell culture
- Inactivating the virus
- Adjuvating the vaccine (adding a substance to boost the immune response)
- Filling and finishing the vaccine

The production of Covaxin is a complex process, but Bharat Biotech has been able to scale up production to meet the
demand for the vaccine. The company is also working to expand production capacity to meet the growing demand for Covaxin in India and around the world.

Immunization - :
Covaxin is a two-dose COVID-19 vaccine that is administered intramuscularly. The first dose is given at 0.5 mL and the second dose is given at 2 weeks after the first dose. The vaccine is approved for use in adults and children over the age of 12 years.
The most common side effects of Covaxin are mild and go away on their own within a few days.

These side effects may include:
1. Pain, redness, and swelling at the injection site
2. Fatigue
3. Headache
5. Chills
6. Fever.

Serious side effects of Covaxin are rare. If you experience any serious side effects after receiving Covaxin, you should seek medical attention immediately.

Emergency use authorization - :
Covaxin was granted emergency use authorization (EUA) in India in January 2021. The EUA was granted based on the results of Phase 1/2/3 trials that showed that Covaxin was safe and effective.

Covaxin has also been granted EUA in Brazil, Mexico, and the Philippines. The vaccine is currently undergoing clinical trials in the United States and other countries.

The EUA for Covaxin is valid for one year and can be renewed. The vaccine is still under development, and more data is needed to determine its long-term safety and efficacy.

Immunogenicity - :
The immunogenicity of Covaxin refers to its ability to induce an immune response in the body. Covaxin has been shown to be immunogenic in both adults and children. In a Phase 1/2/3 trial, Covaxin was shown to induce neutralizing antibodies in 98% of participants after the second dose. Neutralizing antibodies are antibodies that can block the SARS-CoV-2 virus from infecting cells.

Covaxin has also been shown to induce T cell responses in the body. T cells are a type of white blood cell that play a role in the immune response. The immunogenicity of Covaxin is promising, and the vaccine has the potential to protect people from COVID-19. However, more data is needed to confirm the long-term safety and efficacy of Covaxin.

Vaccine Side Effects - :
The most common side effects of Covaxin are mild and go away on their own within a few days. These side effects may include:

Pain, redness, and swelling at the injection site
Fatigue
Headache
Muscle pain
Chills
Fever.

Serious side effects of Covaxin are rare. If you experience any serious side effects after receiving Covaxin, you should seek medical attention immediately.

The following are some of the more serious side effects that have been reported after receiving Covaxin:
Anaphylaxis (a severe allergic reaction)
Guillain-Barré syndrome (a rare neurological disorder)
Myocarditis (inflammation of the heart muscle) Pericarditis (inflammation of the lining around the heart).

It is important to note that the side effects of Covaxin are generally mild and go away on their own. If you experience any side effects after receiving Covaxin, you should talk to your doctor.
Causes Of Covid-19 -:

COVID-19 is caused by severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). It primarily spreads through respiratory droplets when an infected individual coughs, sneezes, or talks. Other modes of transmission, such as close contact with infected individuals or contaminated surfaces, are also possible.

COVID-19 is caused by a virus called severe acute respiratory syndrome coronavirus 2 (SARS-CoV-2). SARS-CoV-2 is a respiratory virus that can spread from person to person through respiratory droplets produced when an infected person coughs, sneezes, speaks, or sings. These droplets can land in the mouths or noses of people who are nearby or possibly be inhaled into the lungs.

The virus can also spread through contact with contaminated surfaces or objects. If you touch a surface or object that has the virus on it and then touch your eyes, nose, or mouth, you could become infected.

If you think you may have been exposed to COVID-19 or are experiencing symptoms, it is important to contact your doctor or healthcare provider. There are no specific treatments for COVID-19, but there are medications that can help to relieve symptoms. In some cases, hospitalization may be necessary. The best way to protect yourself from COVID-19 is to get vaccinated. Vaccines help to train your body's immune system to fight the virus. Vaccination is also the best way to protect others from getting sick.

In addition to getting vaccinated, there are other things you can do to protect yourself from COVID-19, such as:

1. Washing your hands often with soap and water for at least 20 seconds.
2. Avoiding close contact with people who are sick.
3. Staying home if you are sick.
5. Cleaning and disinfecting surfaces and objects that may be contaminated.

Diagnosis Tests -:

Various diagnostic tests are employed to identify COVID-19 infection. These include reverse transcription-polymerase chain reaction (RT-PCR) tests, antigen tests, and antibody tests. RT-PCR tests are considered the gold standard for diagnosing active COVID-19 infections.

There are 2 main types of COVID-19 diagnosis tests:

- **Molecular tests** detect the genetic material of the virus. These tests are the most accurate and are the gold standard for diagnosing COVID-19. Molecular tests include:
  - Polymerase chain reaction (PCR) tests are the most common type of molecular test. PCR tests amplify the genetic material of the virus, making it easier to detect.
  - Reverse transcription polymerase chain reaction (RT-PCR) tests are similar to PCR tests, but they are used to detect RNA, which is the genetic material of the virus.

- **Antigen tests** detect proteins from the virus. These tests are less accurate than molecular tests, but they are faster and can be done at home or in a doctor's office. Antigen tests include:
  - Rapid antigen tests are the most common type of antigen test. Rapid antigen tests can give results in as little as 15 minutes.
  - Lateral flow tests are another type of antigen test. Lateral flow tests are similar to rapid antigen tests, but they are not as accurate.

The type of test that is right for you will depend on your individual circumstances and preferences. Talk to your doctor to learn more about the different types of COVID-19 diagnostic tests and to decide which one is right for you.

Here is a table that summarizes the different types of COVID-19 diagnostic tests:

<table>
<thead>
<tr>
<th>Test Type</th>
<th>Accuracy</th>
<th>Speed</th>
<th>Availability</th>
</tr>
</thead>
<tbody>
<tr>
<td>Molecular tests</td>
<td>Most Accurate</td>
<td>Slow</td>
<td>In Laboratories</td>
</tr>
<tr>
<td>Antigen tests</td>
<td>Less Accurate</td>
<td>Fast</td>
<td>In Laboratories, Doctors Offices, At home</td>
</tr>
</tbody>
</table>
Here are some additional things to keep in mind about COVID-19 diagnostic tests:

- The accuracy of a test can vary depending on when it is taken. Tests are more accurate if they are taken within the first few days of symptoms.
- The availability of tests can vary depending on where you live. In some areas, it may be difficult to get a test.
- The cost of tests can vary depending on where you live and the type of test you get.

If you think you may have been exposed to COVID-19 or are experiencing symptoms, it is important to contact your doctor or healthcare provider. They can help you determine if you need to get tested and can recommend the best type of test for you.

Factors Contributing to Development of Covaxin -:

Several factors contribute to the development of Covaxin, including extensive research, clinical trials, manufacturing processes, and regulatory approvals. The review highlights the significance of these factors in the successful development of the Covaxin vaccine.

- The urgency of the COVID-19 pandemic:
  The global pandemic created a sense of urgency to develop a COVID-19 vaccine, and this led to increased funding and resources being dedicated to the development of Covaxin.
- The availability of technology: The technology for developing vaccines has advanced significantly in recent years, and this made it possible to develop Covaxin more quickly than would have been possible in the past.
- The commitment of scientists and researchers: The scientists and researchers who worked on Covaxin were dedicated to developing a safe and effective vaccine, and their hard work and dedication was essential to the success of the project.

In addition to these factors, the following table also shows factors contributed to the development of Covaxin:

<table>
<thead>
<tr>
<th>Factors</th>
<th>Description</th>
</tr>
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<tbody>
<tr>
<td>Pre-existing Knowledge and</td>
<td>Bharat Biotech, the company that developed Covaxin, had a long history of</td>
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<tr>
<td>Technology</td>
<td>working on vaccines. They had already developed a number of vaccines for</td>
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<tr>
<td></td>
<td>other diseases, and they had the expertise and infrastructure in place to</td>
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<td></td>
<td>develop a COVID-19 vaccine quickly.</td>
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<tr>
<td>Access to Funding</td>
<td>The Indian government provided significant funding to Bharat Biotech to</td>
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<td></td>
<td>help them develop Covaxin. This funding allowed Bharat Biotech to</td>
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<td></td>
<td>accelerate the development process and to conduct clinical trials on a</td>
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<tr>
<td></td>
<td>large scale.</td>
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<tr>
<td>International Collaboration</td>
<td>Bharat Biotech collaborated with other organizations, such as the National</td>
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<td></td>
<td>Institute of Virology in India, to develop Covaxin. This collaboration</td>
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<td>helped to ensure that Covaxin was developed using the latest scientific</td>
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<td></td>
<td>knowledge and that it met international standards.</td>
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</tbody>
</table>
Timeliness

Bharat Biotech was able to develop Covaxin quickly, in a matter of months. This was due to a number of factors, including the pre-existing knowledge and technology that Bharat Biotech had, the access to funding and the international collaboration.

Treatment of COVID-19 by Covaxin Vaccine -:

Covaxin functions by triggering an immune response that enables the body to recognize and neutralize the SARS-CoV-2 virus. The vaccine aids in preventing severe disease, hospitalization, and death caused by COVID-19. The literature review assesses the effectiveness and safety profile of Covaxin in treating COVID-19.

Covaxin is a vaccine, not a treatment for COVID-19. Vaccines work by helping the body’s immune system develop antibodies against a virus. Once the body has antibodies against a virus, it can fight off the virus if it is ever exposed to it again.

Covaxin is a whole inactivated virus (WI) vaccine. This means that the SARS-CoV-2 virus is grown in a cell culture and then inactivated, or killed. The inactivated virus is then mixed with an adjuvant, which is a substance that helps to boost the immune response.

Covaxin is a two-dose vaccine, and the recommended dose is 0.5 mL for each dose. The first dose is given, and the second dose is given 28 days later.

The efficacy of Covaxin has been shown to be 78% against symptomatic COVID-19 and 93% against severe disease. The vaccine is also effective against the Alpha, Beta, Gamma, and Delta variants of SARS-CoV-2.

Covaxin is a safe and effective vaccine that has the potential to protect people from COVID-19. However, more data is needed to confirm the long-term safety and efficacy of Covaxin.

If you are infected with COVID-19, there are treatments available that can help to relieve symptoms and prevent serious complications. These treatments include:

- **Paxlovid**: Paxlovid is an oral antiviral medication that can be used to treat people who are at high risk of developing severe COVID-19.
- **Molnupiravir**: Molnupiravir is another oral antiviral medication that can be used to treat people who are at high risk of developing severe COVID-19.
- **Remdesivir**: Remdesivir is an intravenous antiviral medication that can be used to treat people who are hospitalized with COVID-19.

If you are experiencing symptoms of COVID-19, it is important to see a doctor as soon as possible. They can help you determine if you need treatment and can recommend the best treatment for you.

Use OF Covaxin Vaccine -:

Covaxin has been authorized for emergency use in various countries. The review discusses the prioritization strategies for vaccine distribution, challenges in vaccine administration, and the role of Covaxin in global vaccination campaigns.

Covaxin is a vaccine that is used to prevent COVID-19. It is a whole inactivated virus (WI) vaccine, which means that the SARS-CoV-2 virus is grown in a cell culture and then inactivated, or killed. The inactivated virus is then mixed with an adjuvant, which is a substance that helps to boost the immune response.

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The vaccine is also effective against the Alpha, Beta, Gamma, and Delta variants of SARS-CoV-2.

The uses of Covaxin vaccine include:

- **Preventing COVID-19**: Covaxin can help to prevent people from getting COVID-19. If you are vaccinated with Covaxin, you are less likely to get sick if you are exposed to the virus.

- **Reducing the severity of COVID-19**: If you do get COVID-19 after being vaccinated with Covaxin, you are less likely to experience severe symptoms. This means that you are less likely to need to be hospitalized or to die from the disease.

- **Protecting others from COVID-19**: When you are vaccinated with Covaxin, you are less likely to spread the virus to others. This helps to protect your family, friends, and community from COVID-19.

If you are considering getting the Covaxin vaccine, it is important to talk to your doctor. They can help you determine if the vaccine is right for you and can answer any questions you have.

**Coronavirus Genome Structure and Replication**

The CoVs genome is a single-stranded positive-sense RNA (+ssRNA) molecule. The genome size ranges between 27–32 kbp, one of the largest known RNA viruses. The genomic structure of CoVs contains at least six open reading frames (ORFs). The first ORFs (ORF1a/b), located at the 5′ end, encode a polyproteins 1a, b (pp1a, pp1b). Other ORFs are located on 3′ end encodes at least four structural proteins: envelop glycoprotein spike (S), responsible for recognizing host cell receptors. Membrane (M) proteins, responsible for shaping the virions. The envelope (E) proteins, responsible for virions assembly and release. The nucleocapsid (N) proteins are involved in packaging the RNA genome and in the virions and play roles in pathogenicity as an interferon (IFN) inhibitor. In addition to the four main structural proteins, there are structural and accessory proteins that are species-specific, such as HE protein, 3a/b protein, and 4a/b protein. Once the viral genome enters the cytoplasm of the target cell, and given it is a positive-sense RNA genome, it translates into two polyproteins 1a, b (pp1a, pp1b). These polyproteins are processed into 16 non-structural proteins (NSPs) to form a replication-transcription complex (RTC) that is involved in genome transcription and replication. Consequently, a nested set of sub genomic RNAs (sgRNAs) is synthesized by RTC in the form of discontinuous transcription.
The genomic organization of SARS-CoV-2. The genome encodes two large genes ORF1a (yellow), ORF1b (blue), which encode 16 non-structural proteins (NSP1–NSP16). These NSPs are processed to form a replication–transcription complex (RTC) that is involved in genome transcription and replication. For example, NSP3 and NSP5 encode for Papain-like protease (PLP) and 3CL-protease, respectively. Both proteins function in polypeptides cleaving and block the host innate immune response. NSP12 encodes for RNA-dependent RNA polymerase (RdRp). NSP15 encodes for RNA helicase. The structural genes encode the structural proteins, spike (S), envelope (E), membrane (M), and nucleocapsid (N), highlighted in green. The accessory proteins (shades of grey) are unique to SARS-CoV-2 in terms of number, genomic organization, sequence, and function.

**Covaxin Statement**:  
The safety of Covaxin has been evaluated in several clinical trials. The Phase 3 trial of Covaxin found that the vaccine was well-tolerated. The most common side effects were mild and included pain at the injection site, fever, and fatigue.

Covaxin is a safe and effective vaccine that has the potential to protect people from COVID-19. However, more data is needed to confirm the long-term safety and efficacy of Covaxin.

Here are some of the research articles that I have found on the topic of Covaxin vaccine:

- **Covaxin**: A review of its development, efficacy, and safety (2022).

**Conclusion**:  
Covaxin has emerged as a promising tool in the fight against COVID-19. Extensive research, rigorous clinical trials, and regulatory approvals have contributed to its development. The vaccine demonstrates efficacy in preventing severe disease and mortality associated with COVID-19. However, ongoing surveillance, monitoring, and research are essential to evaluate its long-term safety and effectiveness.

Covaxin is a safe and effective vaccine that has the potential to protect people from COVID-19. The vaccine has been shown to be 78% effective against symptomatic COVID-19 and 93% effective against severe disease. The vaccine is also effective against the Alpha, Beta, Gamma, and Delta variants of SARS-CoV-2. Covaxin has been approved for use in several countries, including India, Brazil, and Mexico. The vaccine is also being evaluated for use in other countries.

The safety of Covaxin has been evaluated in several clinical trials. The Phase 3 trial of Covaxin found that the vaccine was well-tolerated. The most common side effects were mild and included pain at the injection site, fever, and fatigue.

More data is needed to confirm the long-term safety and efficacy of Covaxin. However, the available data suggests that Covaxin is a safe and effective vaccine that can help to protect people from COVID-19.

In conclusion, Covaxin is a promising vaccine that has the potential to make a significant contribution to the fight against COVID-19. The vaccine is safe and effective, and it has been shown to be effective against a variety of SARS-CoV-2 variants. More data is needed to confirm the long-term safety and efficacy of Covaxin, but the available data is promising.

Most importantly, general precautions should be strictly followed by both health-care providers and their patients, such as social distancing, wearing a mask, washing hands, and using disinfectants, to reduce the risk of infection in patients.
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