

Intranasal Vaccine for COVID-19

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In news- Recently, the Drugs Controller General of India gave permission to Bharat Biotech to conduct standalone phase-3 trials on its Covid-19 intranasal vaccine.

What is intranasal vaccine & how does it work?

- **Vaccines are usually given through different routes, with the most common being injectable shots** delivered into the muscles (**intramuscular**) or the tissue just **between the skin and the muscles (subcutaneous)**.
- **Other routes** of delivery, especially in some vaccines for infants, include administering the liquid solution **orally** instead of injecting.
- **In the intranasal route, the vaccine is sprayed into the nostrils and inhaled.**
- **Many viruses, including the coronavirus, enter the body through mucosa – wet, squishy tissues** that line the nose, mouth, lungs and digestive tract **triggering a unique immune response** from cells and molecules there.
- **Intramuscular vaccines generally fail at eliciting this mucosal response**, and instead rely on immune cells mobilised from elsewhere in the body flocking to the site of infection.
- **Experts believe an intranasal vaccine will act against the virus from the time it tries to break the body's barrier**, thereby making it more effective than the intramuscular ones in many cases.
- Generally, both the aforementioned types of vaccines trigger a response in the blood.
- B cells, for example, would churn out antibodies including a particularly potent disease-fighter called IgG – to roam the body in search of the virus.

- Other cells, called T cells, would either help B cells produce antibodies or seek out and destroy the infected cells.
- **However, vaccines that are injected through the nose or mouth would also tap into another set of immune cells that hang around mucosal tissues.**
- The B cells that reside there can make another type of **antibody, called IgA**, that plays a large role in destroying the airway pathogens.
- In addition to this, the T cells that are residing nearby will be able to memorize the pathogens that it encountered and will lifelong scout the areas where these were first encountered.
- Hence an intranasal vaccine stimulates **a broad immune response** – neutralizing IgG, mucosal IgA, and T cell responses.
- These vaccines aim to overcome potential difficulties with mass vaccination and reduce the cost by doing away with the need for needles and syringes.
- Intranasal vaccines are also expected to cut down on the dependence on various trained personnel to administer the vaccine, according to experts.
- **The effectiveness of an intranasal vaccine was first seen in the 1960s when polio doses replaced its injected predecessor.**

Drawbacks-

- **It was first noted after the rollout of the oral polio vaccines** where in some cases, it still caused the disease after the weakened virus in the product mutated.
- There is very little evidence to back the effectiveness of this route of delivery so far and, save for some flu vaccines, attempts to deliver vaccines have not been successful.