Typhoid Conjugate Vaccine

Mains: *GS II* - *Issues Relating to Development and Management of Social Sector/Services relating to Health, Education, Human Resources*

Why in News?

Recently, Bangladesh became the eighth country in the world to introduce the Typhoid Conjugate Vaccine (TCV) and nearly 50 million children from 9 months to 15 years will receive the vaccine as part of a campaign, after which the vaccine will be integrated into their routine immunisation programme.

What is Typhoid conjugate vaccine?

- **A TCV (Typhoid Conjugate Vaccine)** – It is a type of vaccine that provides protection against typhoid fever.
- **Dose** – It is a single-dose injection that stimulates the body to produce antibodies against the Salmonella Typhi bacteria.
- **Efficacy** – They are particularly effective because they can be given to infants and young children, unlike older typhoid vaccines that have age restrictions.

  India's neighbours, including Nepal, Pakistan and Bangladesh, have already begun inoculating their children with the typhoid vaccine.

- **Status in India** – Despite the fact that India produces this vaccine and carries half the world's burden of the disease, it is yet to become part of the country's routine childhood vaccinations
- **Typbar TCV** – It is one of the first Typhoid Conjugate Vaccines to be prequalified by WHO in 2017.
- It was manufactured by *Bharat Biotech* which had started manufacturing it in 2013.
- India is the major vaccine supplier for this drive, but is not one of the eight countries to have the typhoid vaccine in its routine immunisation schedule.

What is the epidemiology of Typhoid?

- **Causative agent** – The bacterium *Salmonella typhi* is the primary cause of typhoid fever.
- **Transmission** – It is transmitted between humans directly from faecal and/or urinary contamination of food and water or via vectors such as flies.
- It survives easily in milk without an alteration in taste, and also in ice.

- Untreated, asymptomatic humans can also carry and shed the pathogen in their faeces for two months up to several years.
- **Symptoms & Effects** – Fever in typhoid can last for several weeks.
- Severe complications such as intestinal perforation can lead to death.
- Children are disproportionately affected, leading to loss of schooling and activity days.
- **Burden –** The World Health Organization (WHO) estimates *9-12 million people* being affected by typhoid annually and over 100,000 deaths, with India, Bangladesh and Pakistan as hotspots.
- Travel to and from endemic countries takes it to places.
- The disease is under control in some countries with better sanitation, better diagnostics and surveillance, stringent prescription practices and travel vaccination.

What does the data on India reveal?

- **Effect on children** – Extensive SEFI (Surveillance for Enteric Fever in India) study was done between 2017-2020 in 10 urban and rural sites.
- The incidence per 1,00,000 child-years ranged from 576 to 1,173 cases with higher numbers in poorer urban areas, compared to rural areas.
- **Migrational hazards** – However, extensive labor migration between urban and rural areas allows easy to and fro transport of the pathogen.
- **Mortality** – Geostatistical modeling using these findings and national health survey data estimates 4.5 million cases annually with 8,930 deaths.
- This clearly shows that India contributes to half the global burden of typhoid fever.
- **Future forecasts** – If no action is taken, projections estimate 4.6 crore cases and 89,300 deaths annually in almost all age groups in urban areas, and in young adults in rural areas.

What are the issues and challenges in combating typhoid?

- **Diagnostic gaps –** Typhoid can mimic dengue, scrub typhus, malaria, COVID-19 and other febrile conditions.
- Hence, besides good clinical acumen, robust and accessible diagnostic support is important.
- The recommended test to detect the pathogen is a blood culture, but this is not easily available everywhere.
- Facilities to perform reliable antimicrobial susceptibility testing are also lacking.
- WIDAL, an unreliable blood antibody test, is still around and is extensively misused.
- Unregulated irrational therapy of febrile illnesses complicates the picture.

- **Antibiotic resistance –** From the 1950s onwards, the bacteria has shown increasing resistance to common antibiotics.
- Treatment of typhoid fever now is usually with azithromycin and ceftriaxone.
- However, ceftriaxone resistance and reduced response to azithromycin has been found as recently as in 2021-2024.
- These drugs are commonly abused both in rural and urban India.
- With the presence of extensively drug resistant (XDR) typhoid strains already in Pakistan, the threat is imminent in India.
- Rising drug resistance means lesser options to treat the illness and also increase in

treatment costs.

- **Sub-optimal sanitation –** Despite progress under the Swachh Bharat Mission and Jal Jeevan Mission, issues related to safe water persist.
- While access to water is steadily increasing, water quality remains questionable.
- Only 6% of urban households across 302 districts have safe water supply and in rural areas, the situation is worse.
- Periodic environmental surveillance is also limited and dissatisfactory.

What needs to be done?

- **Vaccine introduction** – In its position paper in 2018, the WHO had strongly recommended typhoid vaccination, particularly the typhoid conjugate vaccine (TCV).
- TCV is available in the private sector for around Rupees,2,000, this high cost leaves out many who are most likely to be affected by the infection.
- Hence, it is imperative to include it in the *Universal Immunisation Programme (UIP),* to ensure health equity
- **Combination of measures** – Introducing the Typhoid vaccine alone is not important.
- The vaccine should be accompanied by:
    - Environmental and disease surveillance,
    - WASH (Water, Sanitation and Hygiene) measures,
    - Improving diagnostics including resistance mapping,
    - Regulation of prescriptions
    - Post-vaccination efficacy studies should all take place as well.

What are the backings for the vaccine?

- **Cost effective** – TCV is one of the newer vaccines, and has shown better results while also being cost effective.
- **More efficient** – It can be given as a single shot and has been found to be effective for 3-10 years.
- **Safety** – This vaccine can also be safely co-administered with other routine childhood vaccines from the age of six months.

TCV by Serum Institute of India and one by Zydus Lifesciences*, yet again asserting India' s position as the vaccine hub of the world.*

- **Promising results of field trials** – In 2018, field trials in Navi Mumbai supported the credibility of the TCV vaccine.
- Over 1 lakh doses were administered and the cost calculation worked out to USD1.87/dose, which is considerably lower than the cost of contracting the disease.
- **Experts support** – The National Technical Advisory Group on Immunisation (NTAGI) has been mulling over this for nearly a decade now.
- Back at the 12th NTAGI meeting, in 2016, it was recommended that typhoid surveillance be improved for future discussions and for recommendations on typhoid vaccine use in India.
- Subsequent meetings of NTAGI have repeatedly brought up typhoid vaccination but

there has been no progress with regard to its being included in the UIP.

- **International collaboration** – In 2023, *the vaccine alliance GAVI*, entered a strategic three-year partnership of $250 million with the government of India.
- It was to help introduce TCV into the UIP, along with support for other vaccination initiatives.

***GAVI** is the Vaccine Alliance, a public-private partnership that provides vaccines to children in the world's poorest countries to protect them from deadly diseases.*

- Two years into the partnership however, there has been no action on the typhoid vaccine.

What lies ahead?

- The silence towards typhoid is baffling. India's neighbors, Pakistan, Nepal, Bangladesh have already surged ahead.
- India with more than half the global burden of enteric illness, must join them and other countries responsibly, sooner than later.
- Typhoid, a preventable disease, has haunted people in India for centuries.
- Every year, due to ambiguous diagnosis, inadequate treatment, drug resistance and slow progress in sanitation, countless lives, especially of children, are lost and many are pushed into poverty.
- We have the vaccine innovation skills, but inclusion is lacking.
- The time is long overdue and the ground uber-fertile now, for the introduction of the typhoid vaccine into the country's routine immunisation programme.

Reference

The Hindu| Typhoid Conjugate Vaccine

SHANKAR IAS PARLIAMENT
Information is Empowering