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The current dengue vaccine landscape, with a focus on TAK-003 (Qdenga®)

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Vaccines are among the most beneficial interventions in terms of their risk-benefit ratio in public health worldwide. In the last decade, we have witnessed the development of new vaccines for endemic diseases, including dengue, which have resurfaced in different regions of the world.

Recently, a document jointly produced by the University Center for Pharmacology (CUFAR, by its Spanish acronym), Hospital Elina de la Serna, and Buenos Aires Medical Federation (FEMEBA, by its Spanish acronym) has been circulated on the efficacy and safety of dengue vaccines, with a focus on the TAK-003 vaccine discussed here.[1]

Advances over the last decade have led to the approval of two live attenuated tetravalent vaccines against dengue, and a third is currently under review in Brazil. However, the role of vaccination in preventing this disease differs significantly from its role in preventing other infections. Since there is no human-to-human transmission, no chronic forms, and no virus carriers, new cases depend strictly on prior contact between the mosquito and the patient during the acute phase, thereby prioritizing preventive efforts against the vector.

The vaccine currently plays a complementary role in a comprehensive strategy against the disease. The Dengvaxia® vaccine is effective in children aged 2 to 16. Still, it has been associated with an increase in serious adverse effects in people who are seronegative for dengue, limiting its use to those who are seropositive. The need for prior testing limits its large-scale applicability, leading the manufacturer to suspend production worldwide.[2]

The Qdenga® vaccine is effective in children aged 4 to 16 in reducing clinical dengue cases and hospitalizations, in both seropositive and seronegative individuals. In seropositive individuals, it also protects against severe forms of the disease, dengue hemorrhagic fever, and all four virus strains. In seronegative individuals, it did not prevent severe dengue or dengue hemorrhagic fever, nor did it demonstrate efficacy against DENV-3 or DENV-4; it has even been suggested that it could increase the risk of hospitalization due to DENV-3. In individuals aged 18 years or older, a good immune response to the vaccine was observed, but the clinical impact has not been studied.

The report includes recent data from Brazil confirming effectiveness against clinical dengue and hospitalized dengue in the vaccinated population aged 10 to 14 years, as well as safety data from Argentina and Brazil that are generally encouraging, except for a higher risk

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of anaphylaxis than with other vaccines. The World Health Organization (WHO) maintains its recommendation to administer Qdenga® to children aged 6 to 16 in settings with high dengue transmission intensity. It is not recommended for use in children under 6 years of age due to lower efficacy in this age group. Within the 6-16 age range, the recommendation depends on the epidemiological behavior in each region, with vaccination recommended between 1 and 2 years before the peak of hospitalizations in that age group.[3]

When introducing the vaccine, the indication can be extended to older age groups, including those aged 6 to 16 years. It also considers offering the vaccine to people with comorbidities aged 6 to 60 years living in endemic countries, provided that a substantial burden of severe dengue outcomes has been documented in the country for these subpopulations. In areas whose indicators are far from the "high transmission intensity" criteria proposed by the WHO (seroprevalence greater than 60% at age 9, average age of peak dengue hospitalizations less than 16 years), as is the case in most regions of our country, and where the majority of the population is seronegative for dengue, the vaccine is expected to reduce the total number of cases and hospitalizations due to dengue. However, there remains uncertainty regarding protection against severe forms and dengue hemorrhagic fever, and an increase in incidence cannot be ruled out.

In Argentina, vaccination with Qdenga® was launched in 2024 for targeted age groups and geographic areas. Current indications vary by jurisdiction: they start at age 15 and, depending on the case, extend to ages 19, 39, 49, or 59. Recommendations range from widespread use in this age group to programs targeting areas of high prevalence, high-risk occupations, and comorbidities. Although vaccination was initially targeted at individuals with a history of dengue infection, most provinces currently do not require it. It would be desirable that, based on these experiences carried out by the different provinces of our country, together with the observations of the National Immunization Commission (CoNaIn, by its Spanish acronym) and the results provided by the VADEN study once it is completed, data may emerge that provide a basis for establishing a national policy on this immunization that takes into account the epidemiological particularities present in each region. ■

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