LETTER TO THE EDITOR

NIPAH VIRUS PROPOSED VACCINES: ARE WE PREPARED FOR THE EXPECTED PANDEMIC?

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Nipah virus is bat-borne paramyxovirus cause a zoonotic infection. Sever and often fatal encephalitis in human. Pigs are the intermediate hosts. Nipah virus represents a serious burden to the health sector; it usually records a high mortality rate reaching up to 75% [*Tyagi S et al. 2025*].

First outbreak was recorded in Malaysia in 1998-1999 involved pig-human transmission, caused 100 deaths and massive dissemination in swine reaching up to 1.1 million pigs, this represented about 40% of swine mass in Malaysia in 1999. Consequently, other outbreaks had been recorded in Asia; Singapore in 1999, 11 cases reported after pigs' importance from Malaysia. In India, the outbreaks occurs since 2001 till present, recently in 2026 two confirmed cases were reported. In Bangladesh outbreaks almost occur regularly since 1999 [*Geisbert T et al. 2021*].

Although the scenario is believed to be less aggressive comparing with that of COVID-19 as NiV is less contagious, the substantial fatality rate had driven the urgent need to develop an effective preventive strategy. Up to now no licensed vaccine to this virus has been launched, neither for human nor for pigs [*Tyagi S et al. 2025*].

Three pig-vaccines still under consideration; adjuvanted soluble G-protein, adjuvanted stabilized F protein and adenoviral vectored G protein (ChAdOx1-G). Immunological studies in pigs revealed that each vaccine elicited distinct immunogenicity profile. Prime dose of all three recorded high degree of protection with acceptable longevity. Such vaccines would protect if not prevent virus transmission to human, reducing socioeconomic consequence associated with expected outbreaks [*McLean R et al. 2025*].

Regarding human, four Nipa virus candidate vaccines are in the clinical trial-phase 1, usually this phase include 20-100 healthy individuals. The live attenuated, vesicular stomatitis virus (VSV) -vectored, recombinant "rSVSΔ GEBOV-GP/NiV" and the adenoviral vector vaccine, ChAdOx1, both are viral vectored vaccine and both are ongoing in the clinical phase-I. A lipid nanoparticle- based messenger RNA vaccine, mRNA 1215, expressing viral glycoproteins, fusion protein (F – protein); and the attachment protein G of NiV was developed by Moderna in collaboration with Vaccine Research Center at NIAID is also in the ongoing in the 1st clinical trial. It mainly targets Malaysian strain Niv- M strain had completed in 2024 [*Kim S et al. 2025, van Doremalen N et al. 2019*].

A protein subunit vaccine, HeV-sGV, mapped out with aluminum hydroxide as adjuvant. Formulated by "Auro Vaccine LLC" in collaboration with "Program Appropriate Technology in health" and "Coalition for epidemic preparedness Innovation" has also been completed the phase-1 clinical trial. This proposed vaccine protects against Niv -Bangladesh and -Malaysian and the Hendra virus [*Geisbert T et al. 2021*].

Scholars, world-wide, identify those Asia-limited outbreaks as the tip of the iceberg and the seed from which future situation of outbreaks will evolve. Developing the aforementioned candidate vaccines make us one step closure to have NiV- approved vaccine.

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