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Letter to the Editor

LC16m8: long term immunity is the way to eradicate monkey pox

Sir,

Another addition to the trend of infectious epidemic diseases instituted by Corona Virus is the monkey pox virus, a concept endemic to the nations of Africa but now globalized in the 2022-2023 epidemic.[1] The priorly mentioned outbreak managed to muster a total of 86,516 cases as of March 2023.[2] As for its name, it is kept due to the viral infection being first witnessed in macaque monkeys. In terms of its virology, it comes under the banner of orthopoxvirus genus of the poxviridae family; a family of large, enveloped, double-stranded DNA viruses. They mainly infect rodents, rabbits, and non-human primates. However, they can also be transmitted to humans, leading to human-to-human transmission. For monkey pox, it is typically facilitated through respiratory droplets or direct contact with the mucocutaneous lesions of an infected individual.

Moving on from the mode of transmission, the pathophysiology of the virus involves usage of unique proteins to infiltrate the body system. These proteins can be dichotomized into; virotransducer proteins and virostealth proteins (both associated with perverting host's immune response). Virotransducer proteins interfere with the cell's ability to respond to the infection, while virostealth proteins reduce the chances of the virus being detected by the immune system. Both types of proteins act intracellularly and have specific roles in modulating the immune response. They affect pathways related to oxidative burst, and apoptosis, and downregulate immune recognition molecules like MHC-1 and CD+4.[3]

Currently, there is no treatment allocated for infected individuals.[4] Medications and prescriptions are to counter and mitigate symptoms. Moreover, as per predictions, Spring and summer gatherings of 2023 may fuel monkey pox resurgence.[5] Hence the immediate focus is on the development and availability of an effective vaccine, that provides protection from said virus and is coupled with trivial side effects. An example of such a vaccine is 'LC16m8' which meets the said criteria but isn't readily available in the global market.

About LC16m8, it is a third-generation live, attenuated vaccine derived from the Lister strain utilized for world health organization's intensified smallpox eradication programme.[6] Primary rabbit kidney cells are used as the cell substrate in the cell culture process to manufacture LC16m8. The vial configuration is multi-dose and lyophilized. The vaccine is stable for 12 months under standard storage settings, and it is also stable for at least 30 days after reconstitution when stored at room temperature or in the refrigerator as per the latest US clinical trials. Currently, the chemo-sero-therapeutic research institute of Kumamoto, Japan is responsible for manufacturing LC16m8.[7] LC16m8's production and utilization is monopolized by Japan hence the reason for its paucity in international markets.

LC16m8 efficacy and effectiveness are substantiated by a comparison made between LC16m8 and Dryvax, both being vaccines for the monkey pox virus.[8] To gauge the intensity of induced immunity, PRNT assay virus test for anti-monkey pox was performed. The outcome had LC16m8 reigning superior by a significant margin i.e., $p<0.001$. Adding to that, it produced cellular responses trending higher than Dryvax's for lymphoproliferation ($p=0.06$) As for the short-term effects, LC16m8 displayed mitigated adverse responses in terms of warmth and tenderness at site of insertion, swollen and tender lymph nodes, appearance of rashes, and limited arm motion.

Moreover, alternative cohorts carry a likeliness to induce myopericarditis in vaccine-taking individuals; something LC16m8 has evolved beyond.[9] Lastly, LC16m8 has the potential to maintain the immunity, it offers, for decades, providing a prolonged immunity against monkey pox, and ensuring permanent eradication of the disease.

Coupled with the fact that LC16m8 is one of the few monkey pox vaccines that have the capacity of replication in humans thus offering immunity after a single dose, substantiates its efficacy as a vaccine and the need for it to be made readily available worldwide, given the current rise in monkey pox and the rise, predicted. We, of VFAHT -volunteer force against hepatitis transmission- an NGO at DOW medical college, urge this news to be spread and to bring this matter to attention for the greater good via this commentary.

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