Mice Vaccination with High Hydrostatic Pressure-Inactivated H3N8 Influenza Virus Protects against Experimental Avian Flu

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H3N8 is an avian influenza virus that was originally isolated from birds, later found in horses and dogs. Here, we used 12h of incubation under high hydrostatic pressure(HHP) for virus inactivation without damage to its hemagglutinin and neuraminidase activities. Our goal is to assess the immunogenic and protective capacity of pressurized virus with and without adjuvant(saponin) in mice. Thus, Balb/c mice were treated by the intranasal route, with 3 doses of $10^{4.5}$ TCID$_{50}$ of virus, or $10^{4.5}$ TCID$_{50}$ virus+saponin, saponin or saline. After vaccination, the mice were challenged and monitored for: virus-specific antibodies(ELISA), CD4 + and CD8 + virus-specific, cytokine(ELISA and double staining) and clinical symptoms. After immunization, there was an increase of IgG1 and IgG2a levels in the serum of virus and virus+saponin groups. In these same groups the production of IgA in nasal lavage was increased. The cell analysis shows increased production of IL-6 and IFN gamma. Two weeks after the challenge, we observe an increase in the production of antibodies and interleukins 2, 4, 6, and TNF alfa. After challenge, the groups saline and saponin showed more clinical signs of disease(lethargy, weight loss and huddling) than vaccinated animals(virus and virus + saponin). The results indicate that the animals present a satisfactory response after vaccination and are protected against challenge. We also started to evaluate viremia in mice and if the immune response is long lasting. Our work reaffirms the use of HHP as an interesting tool in the development of viral vaccines at low cost and good immune response.

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