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Comparison of microporous membranes in the concentration process for high- dose influenza vaccines

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It is generally known that as people get older, immune responses diminish. A series of studies support the decreased immune response to influenza vaccination in the elderly might cause severe respiratory complications associated with influenza infection. For this reason, Fluvad (Seqirus) and Fluzone High Dose (Sanofi Pasteur), which were recently approved adjuvanted and high-dose (HD) influenza vaccines, respectively, are recommended for the elderly as they produce higher SCR and SPR than conventional influenza vaccines.

Especially, manufacturing of HD influenza vaccines need an additional concentration step in which micro-porous membranes are usually applied. High concentration of HA (hemagglutinin) and low levels of surfactant residues should be achieved in HD vaccines. To establish the concentration process, contents of HA and surfactant residues were compared among 3 membranes of different manufacturers (Sartorius, Merck, and PALL). We found that HA concentration increased proportionally to the concentration factor, and the sequential dilution step decreased levels of surfactant residues. Meanwhile, cellulose acetate (CA) and polyether sulfone (PES) are commonly used as micro-porous membrane materials but the characteristics of each material and the interaction between concentrates and membranes may have different influences on the concentration capability of membranes. In our study, PES showed equivalent capability to CA in concentrating HA, but 2-fold higher capability than CA in decreasing surfactant residues. In conclusion, selection of a more appropriate membrane for the additional concentration step may provide an opportunity for further improvement of the manufacturing process of high-dose influenza vaccines.

Biography

Hyeon Jang has completed his Master of Science degree in Medicine from Seoul National University. He has been working as an Associate II (Research Worker) for 2 years in GCC, a leading pharmaceutical company in ROK.

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