Influenza Vaccine

For cancer patients, rates of influenza-associated hospitalization and death are 4 times greater than that of the general population. Previously, we reported reduced immunogenicity to the standard-dose influenza vaccine in patients with central nervous system malignancy. In other poorly responding populations (eg, elderly patients), high-dose vaccination has improved efficacy and immunogenicity.

Methods: A prospective cohort study was designed to evaluate the immunogenicity of the Fluzone® high-dose influenza vaccine in brain tumor patients. Data on diagnosis, active oncologic treatment, and immunologic status (eg, CD4 count, CD8 count, CD4:CD8 ratio) were collected. All patients received the high-dose vaccine (180 µg). Hemagglutination inhibition titers were measured at baseline, day 28, and 3 months following vaccination to determine seroconversion (≥4-fold rise) and seroprotection (titer ≥1:40), which were compared to our prior results.

Results: Twenty-seven patients enrolled. Diagnoses included high-grade glioma (85%), CNS lymphoma (11%), and meningioma (4%). Treatment at enrollment included glucocorticoids (n = 8, 30%), radiation (n = 2, 7%), and chemotherapy (n = 9, 33%). Posttreatment lymphopenia (PTL, CD4 ≤ 200) was observed in 4 patients (15%). High-dose vaccination was well tolerated with no grade III-IV toxicity. Overall, seroconversion rates for the A/H1N1, A/H3N2, and B vaccine strains were significantly higher than in our prior study: 65% vs 37%, 69% vs 23%, and 50% vs 23%, respectively (all $P < .04$). Seroconversion was universally poor in patients with PTL. While seroprotection at 3 months declined in our prior study, no drop was observed following high-dose vaccination in this cohort.

Conclusions: The immunologic response to HD influenza vaccination was higher in this cohort than standard-dose influenza vaccination in our prior report. These findings mirror those in elderly patients where high-dose vaccination is the standard of care and raise the possibility of an immunosenescence phenotype [1)].

1)
Strowd RE, Russell G, Hsu FC, et al. Immunogenicity of high-dose influenza vaccination in patients with primary central nervous system malignancy. Neurooncol Pract. 2018;5(3):176-183. doi:10.1093/nop/npx035