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# High-Dose Seasonal Influenza Vaccine in Patients Undergoing Dialysis

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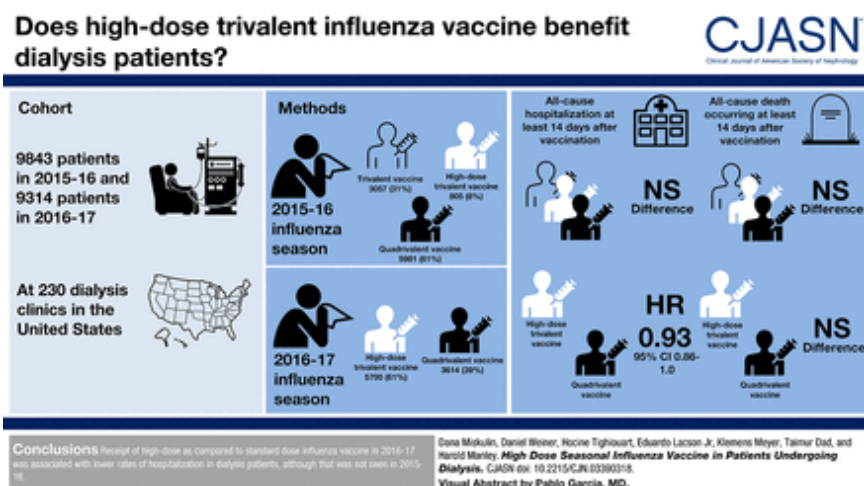
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## Abstract

**Background and objectives** High-dose influenza vaccine, which contains fourfold more antigen than standard dose, is associated with fewer cases of influenza and less influenza-related morbidity in the elderly general population. Whether the high-dose influenza vaccine benefits patients on dialysis, whose immune response to vaccination is less robust than that of healthy patients, is uncertain.

**Design, setting, participants, & measurements** We compared hospitalizations and deaths during the 2015–2016 and 2016–2017 influenza seasons by vaccine type (standard trivalent, standard quadrivalent, and high-dose trivalent influenza vaccine) administered within a national dialysis organization. The association of vaccine type with outcomes was estimated using Cox proportional hazards regression with adjustment for patient factors and “center effect.” Analyses were stratified by age and dialysis modality.

**Results** Between September 1 and December 31, 2015, standard dose trivalent, standard dose quadrivalent, and high-dose trivalent influenza vaccines were administered to 3057 (31%), 5981 (61%), and 805 (8%) patients, respectively. The adjusted rates of first hospitalizations by vaccine type during the influenza season were 8.43, 7.88, and 7.99 per 100 patient-months, respectively, and the adjusted rates of death were 1.00, 0.97, and 1.04, respectively. These differences were not significant. In 2016, 3614 (39%) received quadrivalent vaccine, and 5700 (61%) received high-dose trivalent vaccine. The adjusted rates of first hospitalization by vaccine type were 8.71 and 8.04 per 100 patient-months, respectively, and the adjusted rates of death were 0.98 and 1.02, respectively. Receipt of high dose was associated with a significant reduction in hospitalization (hazard ratio, 0.93; 95% confidence interval, 0.86 to 1.00;  $P=0.04$ ); there was no significant association with death. There was no significant heterogeneity of either association by

age group or dialysis modality.

**Conclusions** Receipt of high-dose compared with standard dose influenza vaccine in 2016–2017 was associated with lower rates of hospitalization in patients on dialysis, although that was not seen in 2015–2016.

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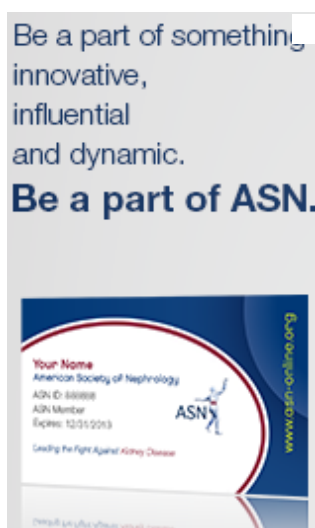
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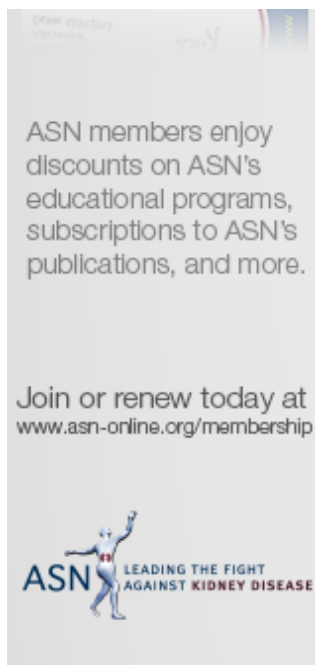
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