Association of Standing-Order Policies With Vaccination Rates in Dialysis Clinics: A US-Based Cross-sectional Study

T. Christopher Bond, PhD,[1] Priti R. Patel, MD, MPH,[2] Jenna Krisher, BS,[3] Leighann Sauls, RN, CDN,[3] Jan Deane, RN, CNN,[4] Karen Strott, BSN, RN, CPHQ,[5] Shelley Karp, BA,[6] and William McClellan, MD, MPH[1,7]

Background: Patients with end-stage renal disease are at increased risk of morbidity and mortality because of infection. Quality improvement efforts for this patient population include assessment of institutional policies and practices that may increase vaccination rates for influenza, hepatitis B, and pneumococcal disease.

Study Design: A survey of vaccination practices, beliefs, and attitudes was sent to all dialysis centers in End-Stage Renal Disease Networks 6, 11, and 15.

Setting & Participants: Of 1,052 dialysis facilities considered, 683 returned the survey, reported vaccination rates for 2005 to 2006, and had 20 or more patients.

Predictor or Factor: Standing-order policy of the dialysis facility, categorized as facility-wide orders, preprinted admission orders for each patient (chart orders), physician-specific orders, and individual orders.

Outcomes: Vaccination rates for influenza, hepatitis B (full or partial series), hepatitis B, and pneumococcal vaccine.

Measurements: Patient vaccination, given at or outside the center.

Results: Overall vaccination rates were 76% ± 18% (SD) for influenza, 73% ± 22% for hepatitis B full or partial series, 62% ± 25% for hepatitis B full series, and 44% ± 34% for pneumococcal vaccine. Compared with individual orders, facility-wide standing orders and chart orders were not associated with greater vaccination rates for influenza (0.4%; confidence interval, −4 to 5; and 1.27%; confidence interval, −3 to 5, respectively), but were associated with greater vaccination rates for hepatitis B full or partial series (9%; confidence interval, 3 to 15; and 11%; confidence interval, 5 to 17, respectively), hepatitis B full series (11%; confidence interval, 4 to 17; and 13%; confidence interval, 7 to 19, respectively), and pneumococcal disease (21%; confidence interval, 14 to 29; and 20%; confidence interval, 13 to 27, respectively).

Limitations: Data are cross-sectional, and vaccinations outside the center were self-reported.

Conclusions: Existing facility-wide or chart-based order programs may be effective in promoting vaccination against hepatitis B and pneumococcal disease.

Am J Kidney Dis 54:86-94.

INDEX WORDS: Vaccination; standing order policies; end-stage renal disease; influenza; hepatitis B; pneumococcal disease.

Editorial, p. 6

Immunization against influenza and hepatitis B reduces morbidity and mortality in the general population.[1,2] In patients with end-stage renal disease (ESRD), influenza and hepatitis B immunization reduces infection rates,[3-6] hospitalizations, and mortality.[6,7] Additionally, the pneumococcal polysaccharide vaccine is recommended for patients at increased risk of pneumococcal disease and its complications, including patients with kidney failure.[8] Despite these benefits, substantial undervaccination has been reported in patients with ESRD.[9,10]

In comparison to other at-risk patient populations, patients with ESRD have frequent encoun-

From the [1]Department of Epidemiology, Rollins School of Public Health, Emory University; [2]Centers for Disease Control and Prevention, Atlanta, GA; [3]ESRD Network 6/The Southeastern Kidney Council Inc, Raleigh, NC; [4]ESRD Network 11/The Renal Network of the Upper Midwest Inc, St Paul, MN; [5]ESRD Network 15/The Intermountain ESRD Network, Denver, CO; [6]Abacus Statistical Consultants, Lakewood, CO; and the [7]Department of Medicine, Renal Division, Emory University, Atlanta, GA.

Received August 25, 2008. Accepted in revised form December 24, 2008. Originally published online as doi: 10.1053/j.ajkd.2008.12.038 on April 6, 2009.

Address correspondence to T. Christopher Bond, PhD, Department of Epidemiology, Rollins School of Public Health, Emory University, 1518 Clifton Rd NE, Atlanta, GA 30322. E-mail: tcbond@emory.edu

0272-6386/09/5401-0014$36.00/0
doi:10.1053/j.ajkd.2008.12.038

ters with the health care system: most receive dialysis treatments 3 times/wk at a hemodialysis facility. Patients with ESRD are fully covered under Medicare, and each dialysis facility participates in 1 of 18 regional ESRD Networks under contract to the Centers for Medicare & Medicaid Services (CMS). Network responsibilities include oversight of care and collection and feedback of performance measure data.

Since 2005, the immunization quality improvement efforts of Networks 6, 11, and 15 have been coordinated with academic, professional, public health, and patient groups in the Safe and Timely Immunization Coalition (STIC). STIC activities focus on achieving the Healthy People 2010 objectives for immunization against vaccine-preventable diseases in persons with ESRD: 90% coverage for influenza, hepatitis B, and pneumococcal disease.

Standing-order policies have been advocated as a best practice in recent years in various contexts. A 2002 CMS policy change allows for[11] and recent guidelines advocate[1,12-14] the institution of these policies for vaccination of high-risk patients. Standing orders authorize nurses or other nonphysicians to administer vaccinations under an institution- or physician-approved protocol without direct physician involvement at the time of vaccination. Some evidence for the positive association between standing-order policies and vaccination rates has been shown in long-term care facilities[15-19] and in a 10-year study at a Veterans Administration hospital.[20] Other studies have shown the difficulties implementing such a system.[21,22] However, use of standing orders for vaccinations in dialysis centers has not been described previously.

The goals of this STIC-facilitated project were to: (1) document vaccination policies and practices at dialysis centers across the 14 states of these 3 Networks, (2) report any association between treatment-center policies and reported vaccination rates, and (3) analyze this association after adjustment for facility characteristics that may be associated with vaccination rates.

METHODS

Target Population

Dialysis facilities from ESRD Networks 6 (North Carolina, South Carolina, and Georgia), 11 (Michigan, Minnesota, North Dakota, South Dakota, and Wisconsin), and 15 (Arizona, Colorado, Nevada, New Mexico, Utah, and Wyoming) were included. These are the 3 Networks that chose to participate in STIC.

Measurements and Data Collection

Three sources of data were merged to produce a data set for analysis: (1) a 2006 STIC Vaccination Practices, Beliefs, and Attitudes (VPBA) survey of all centers in the 3 Networks to ascertain their standing-order policies for the 3 immunizations considered; (2) 2005 to 2006 influenza, hepatitis B, and pneumococcal vaccination status by patient, collected by the 3 Networks; and (3) center-level characteristics and demographics based on facility surveys (CMS 2744) and baseline patient information forms (CMS 2728).

For this analysis, a center was included only if the VPBA survey was returned, immunization data were reported, and the center had 20 or more patients. Information from the VPBA survey was available from 886 of these 1,052 centers (84.2%). Vaccination information was available for a total of 54,749 patients from 873 of 1,052 centers (83.0%) across ESRD Networks 6, 11, and 15. Of these centers, 776 had 20 or more patients. A total of 683 centers met all inclusion criteria (Fig 1).

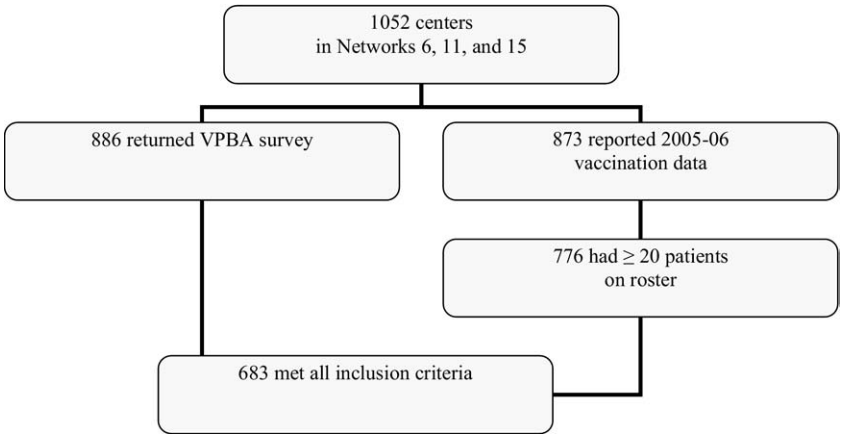

Figure 1. Study flow. Abbreviation: VPBA, Vaccination Practices, Beliefs, and Attitudes.