

## EFFECT OF PEDIATRIC PNEUMONIA VACCINATION ON INVASIVE PNEUMOCOCCAL DISEASE IN ADULT HIV PATIENTS

Investigators conducted a surveillance study of approximately 10.8 million adults from 7 states in order to compare invasive pneumococcal disease among HIV-infected adults before and after the introduction of a pediatric conjugate vaccine. Between baseline (1998–1999) and 2003, patients aged 18 to 64 years with *Streptococcus pneumoniae* isolated from a sterile site were included. Of 8582 cases of invasive pneumococcal disease in adults, 2013 (24%) occurred among HIV patients with or without AIDS. The ratio of invasive pneumococcal disease in HIV-infected adults to the number of adults with AIDS decreased by 19% ( $P = 0.002$ ), from 1127 cases per 100,000 AIDS population during baseline to 919 in 2003. Among HIV-infected adults, the ratio for disease caused by pneumococcal serotypes included in the conjugate vaccine decreased 62% ( $P < 0.001$ ), although the ratio for disease caused by nonvaccine serotypes increased 44% ( $P < 0.001$ ). Despite increased disease caused by nonvaccine serotypes, an overall decrease in invasive pneumococcal disease among HIV-infected adults was associated with introduction of a conjugate vaccine in children; monitoring of this population is necessary to determine whether there will be long-term effects on invasive pneumococcal disease among HIV-infected adults.

Flannery B, Heffernan RT, Harrison LH, et al. Changes in invasive pneumococcal disease among HIV-infected adults living in the era of childhood pneumococcal immunization. *Ann Intern Med* 2006; 144:1–9.

## TENOFOVIR-ASSOCIATED ACUTE AND CHRONIC KIDNEY DISEASE IN HIV PATIENTS

The authors report 5 cases of tenofovir-associated acute renal failure (ARF) in HIV-infected patients who had classic findings of acute tubular necrosis (ATN) and compared the major findings for these patients with data on 22 patients described in the literature (patients were identified via literature search using the Medline database) in order to describe a possible mechanism for tenofovir-associated ARF as well as recommend monitoring guidelines. Patients developed Fanconi syndrome ( $n = 16$ ), non-anion gap metabolic acidosis ( $n = 19$ ), hypokalemia ( $n = 13$ ), and nephrogenic diabetes insipidus ( $n = 5$ ). The mean serum creatinine level in these patients increased from 0.9 to 3.9 mg/dL, and it decreased to 1.2 mg/dL during recovery. ARF, which manifested primarily as ATN, resolved in 22 of 27 patients when tenofovir was discontinued. Patients most frequently received tenofovir therapy in combination with ritonavir or lopinavir-ritonavir ( $n = 21$ ), atazanavir ( $n = 5$ ), and didanosine ( $n = 9$ ). The authors recommend frequent monitoring of renal

function (biweekly during the first 2 months of therapy and monthly thereafter) in patients receiving tenofovir therapy with ritonavir or lopinavir-ritonavir, ritonavir plus didanosine, or ritonavir plus atazanavir, particularly in patients with a creatinine clearance rate below 50 mL/min. Tenofovir therapy should be discontinued if there is a significant increase in serum creatinine ( $\geq 0.5$  mg/dL or an increase by 50%) or new-onset renal tubular dysfunction.

Zimmermann AE, Pizzoferrato T, Bedford J, et al. Tenofovir-associated acute and chronic kidney disease: a case of multiple drug interactions. *Clin Infect Dis* 2006;42:283–90.

## EPIDEMIOLOGY AND OUTCOMES OF HEALTH CARE-ASSOCIATED PNEUMONIA

In order to differentiate health care-associated pneumonia (HCAP; pneumonia acquired in an outpatient setting/subacute care facility) from community-acquired pneumonia (CAP), researchers conducted a retrospective cohort study using data obtained between 2002 and 2003 from a large US inpatient database in order to characterize the microbiology and outcomes among hospitalized patients ( $N = 4543$ ) with culture-positive CAP, HCAP, hospital-acquired pneumonia (HAP), and ventilator-associated pneumonia (VAP). Of these patients, 48.9% had CAP, 21.7% had HCAP, 18.4% had HAP, and 11% had VAP. Although *Staphylococcus aureus* was a major pathogen in all groups, it occurred far more frequently in the non-CAP groups versus the CAP group. Mortality rates were comparable for HCAP and HAP, at 19.8% and 18.8% ( $P > 0.05$ ), respectively, and both were significantly higher than rates for CAP (10%; all  $P < 0.0001$ ) but lower than rates for VAP (29.3%; all  $P < 0.0001$ ). Mean length of stay varied significantly with pneumonia category (in order of ascending values: CAP, HCAP, HAP, and VAP; all  $P < 0.0001$ ). Similarly, mean hospital charges varied significantly with pneumonia category (in order of ascending value: CAP, HCAP, HAP, and VAP; all  $P < 0.0001$ ). This analysis demonstrated that HCAP was distinct from CAP and that HCAP is more similar to HAP. *S. aureus* was a major pathogen of all pneumonias with higher rates in non-CAP. Compared with CAP, non-CAP was associated with more severe disease, higher mortality rate, greater length of stay, and increased costs.

Kollef MH, Shorr A, Tabak YP, et al. Epidemiology and outcomes of health-care-associated pneumonia: results from a large US database of culture-positive pneumonia. *Chest* 2005;128:3854–62.

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