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### **Device-Associated Infection Rates, Extra Length of Stay, Extra Mortality, Microorganism Profile, and Bacterial Resistance in two ICUs from Cuba: Findings of the International Nosocomial Infection Control Consortium (INICC).**

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#### **Objectives:**

To determine the rates and consequences of device-associated infections (DAI) in two intensive care units (ICU) of two INICC members hospitals in Cuba.

#### **Methods:**

An open label, prospective cohort, active DAI surveillance study was conducted on adults admitted to two tertiary-care ICUs of Cuba. The protocol and methodology implemented were developed by INICC. Data collection was performed in the participating ICUs. Data uploading and analyses were conducted at INICC headquarters on proprietary software. DAI Rates were recorded by applying the definitions of the CDC NNIS. We analyzed the DAI, mechanical ventilator-associated pneumonia (VAP), central line-associated bloodstream infection (CLAB), and catheter-associated urinary tract infection (CAUTI) rates, microorganism profile, bacterial resistance, extra length of stay (ELOS) and extra mortality.

#### **Results:**

From 5/06 to 9/09, we enrolled 1,914 patients, representing 14,157 bed days. The overall DAI rate was 22.6% (95% CI, 20.7 – 24.5) and 30.6 per 1000 bed days (95% CI, 27.8 – 33.5). The VAP rate was 43.67 per 1000 device days (95% CI, 39.17 – 48.5), CLAB rate was 1.25 per 1000 CL days (95% CI, 0.72 – 2.00), and CAUTI rate was 6.37 (95% CI, 5.09 – 7.86).

Overall 28.0% of all DAI were caused by *E.Coli*—100% were resistant to Ceftazidime and 100% Ceftriaxone—; 20% by *Klebsiella* sp.—100.0% of which were resistant to ceftazidime, 100% to ceftriaxone and 100% to imipenem—; 20% by *Coagulasa Negative Staphylococci*; and 16.0% by *Pseudomonas sp*—100.0% were resistant to ceftazidime, and 100% were resistant to ceftriaxone.

The LOS of patients without DAI was 5.0 days; the LOS of patients with CLAB was 10.0 days (RR, 2.00; 95% CI, 1.29-3.10; P, 0.0016), representing 5.0 extra days; the LOS of patients with VAP was 17.0 days (RR, 3.41; 95% CI, 3.08-3.77; P, 0.0001), representing 12.0 extra days; and the LOS of patients with CAUTI was 15.1 (RR, 3.03; 95% CI, 2.50 – 3.67, P 0.0001), representing 10.1 extra days.

A total of 245 out of 721 (34.0%) patients without DAI died; 1 out of 2 patients with CLAB died (50.7%), the extra mortality being 16% (RR, 1.47, 95% CI 0.21 – 10.49, P, 0.6981); 20 out of 24 patients with VAP died (83.3%), the extra mortality being 49% (RR, 2.45, 95% CI 1.55 – 3.87, P, 0.0001); 4 out of 7 patients with CAUTI died (57%), the extra mortality being 23% (RR 1.68, 95% CI 0.63 – 4.52, P 0.2970).

#### **Conclusions:**

The VAP rate is higher than NHSN's rates and lower than INICC's rates, CLAB rates are lower than INICC's and NHSN's rates, and CAUTI rates are similar to NHSN's rates and lower than INICC's rates. VAP increased significantly the LOS and mortality rate.