Cardiovascular implantable electronic device-related infections linked with increased risk of death

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An association has been found between infection associated with cardiovascular implantable electronic devices (CIEDs) and increases in mortality and hospital care costs, according to a report published Online First by *Archives of Internal Medicine*. The article is part of the journal's Health Care Reform series.

Therapy with CIEDs, which include pacemakers, implantable cardioverter-defibrillators and cardiac resynchronization therapy /defibrillator devices, can reduce illness and death rates in appropriately selected patients, according to background information in the article. However, complications including infection may mitigate this benefit. "Although it is well recognized that the rate of CIED infection is increasing faster than the rate of CIED implantation, there are limited published data on the risk-adjusted mortality and cost associated with CIED infection or the relationship of these outcomes to different CIED types," write the authors.

Muhammad R. Sohail, M.D., from the Mayo Clinic College of Medicine, Rochester, Minn., and colleagues analyzed the risk-adjusted total and incremental admission mortality, long-term mortality, admission length of stay (LOS) and admission cost associated with infection. They used data from the 100% Medicare Standard Analytic File Limited Data set version for inpatient admissions. The study group consisted of 200,219 Medicare fee-for-service patients who were

admitted for CIED generator implantation, replacement or revision between January and December 2007. The researchers used the Centers for Medicare & Medicaid Services' payment-rate calculation methods, and used factors to reflect the admitting hospital's location, teaching status and indigent care load in order to standardize charges.

Researchers found a total of 5,817 admissions with infection. Depending on the CIED type, infection was associated with significant increases in adjusted admission mortality (4.6 percent to 11.3 percent, depending on type of device) and long-term mortality (26.5 percent to 35.1 percent, depending on type of device). Approximately half of the incremental long-term mortality occurred after patients were discharged. Depending on CIED type, the adjusted LOS was significantly longer with infection. With infection, the standardized adjusted incremental and total admission costs were $14,360 to $16,498 and $28,676 to $53,349, depending on CIED type. Intensive care accounted for more than 40 percent of the incremental admission cost. When researchers adjusted long-term mortality rate and cost ratios with infection by CIED type, pacemakers were associated with significantly greater increases in both measures, compared with implantable cardioverter-defibrillators or cardiac resynchronization therapy/defibrillator devices.

"Our work demonstrates that Medicare beneficiary admissions for CIED procedures with infection are associated with significant, device-dependent, incremental increases in admission mortality and long-term mortality, LOS, and cost compared with those without infection," write the authors. "Intensive care and pharmacy services accounted for more than half of the incremental cost with infection and could be targeted to reduce costs associated with management of CIED infection. The etiology of excess mortality in patients with CIED infection after hospital discharge remains unclear and merits further investigation."

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