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EDITORIAL

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Editorial to 'Antibiotic envelope is associated with reduction in cardiac implantable electronic devices infections especially for high-power device—Systematic review and meta-analysis'

The infection of cardiovascular implantable electronic device (CIED) infection was 1.9/1000 device-years, with an incidence of pocket infection alone of 1.37/1000 device-years and an incidence of pocket infection with bloodstream infection or device related endocarditis of 1.14/1000 device-years. Especially, the cumulative probability of CIED infection was higher among patients with implantable cardioverter defibrillator (ICD) as compared to those with permanent pacemarker (PPM).[1] Risk factor of CIED infection were diabetes mellitus, heart failure, generator replacement, renal dysfunction. In addition, oral anticoagulant usage, long-term corticosteroid usage, and the presence of more than 2 pacing leads were identified as independent correlates of device infection.[2] In the article published in *Journal of Arrhythmia*, Pranata et al[3] investigated whether the role of antibiotic envelopes (TYRX) in preventing CIED related infections as compared to standard infection prevention strategies. This systematic review and meta-analysis showed that the use of antibiotic envelopes (TYRX) was associated with a reduced rate of major infections, especially in patients receiving high power CIED. Mortality was similar in both antibiotic envelopes and control groups. The risk of publication bias remained high, as shown in the funnel-plot analysis. In subgroup analysis, they explored the effectiveness of antibiotic envelopes on patients receiving high power device, including cardiac resynchronization therapy defibrillator (CRT-D) and ICD, and low power device (CRT-P and pacemaker) placement. The incidence of infection in the high power device was 22 (0.71%) in antibiotic envelopes group and 54 (1.65%) in the control group (statistically significant). The incidence of infection in low power device was 13 (0.71%) in antibiotic envelopes group and 11 (0.68%) in control group (statistically not significant). Subgroup analysis showed that antibiotic envelopes reduced the incidence of infection in patients receiving high power device. Antibiotic envelope did not reduce the risk of infection in patients undergoing low power device implantation. Prutkin et al[4] demonstrated an overall high power device (ICD) infection rate of 1.7% within 6 months. The presence of an adverse event, especially where there was early reoperation for hematoma or lead dislodgement, greatly increased the rate of infection. In addition, reentering an ICD pocket for an upgrade, manufacturer advisory, or malfunction also increased infection rates. Efforts should be made to prevent the need for early reintervention during the peri-implant time period and carefully consider when to re-enter the pocket for reasons other than battery replacement. The rate of device infection for high power device was similar this manuscript and antibiotic envelopes (TYRX) might be effective for preventing device infection. Henrikson et al[5] supported this manuscript that a major CIED infection occurred in 5 of 1,129 patients treated with TYRX significantly lower than the 12-month benchmark rate of 2.2% (P = .0023). Among the TYRX-treated CRT cohort, the major CIED infection rate was 0.7% compared with an infection rate of 1.0% and 1.3% (P = .38 and P = .02) in site-matched and comorbidity-matched control groups respectively. Among the ICD group, the 12-month infection rate was 0.2% compared with the published benchmark of 2.2% (P = .0052). However, the use of an antibiotic envelope (TYRX) is associated with several limitations. One must consider the cost associated with prophylactic antibiotic envelop use. The cost of antibiotic envelops (TYRX) is more expensive as compared to those without antibiotic envelops (TYRX). Second, when we use an antibiotic envelope (TYRX), the pocket size of device will be larger as compared to those without antibiotic envelops (TYRX). Therefore, it is difficult to use antibiotic envelops (TYRX) for low BMI patients. Furthermore, the effect of antibiotic envelops on hard clinical endpoints like death is not well-established. Observational studies in the past failed to report an increased occurrence of post-implantation mechanical complications like generator pocket hematoma, lead dislodgment, and migration in the antibiotic envelop cohort as compared to the nonenvelop cohort. I feel that it may be reasonable to use antibiotic envelops (TYRX) when we will implant high power device for patients with diabetes mellitus, heart failure, generator replacement, renal dysfunction oral anticoagulant usage, long-term corticosteroid usage, and the presence of more than 2 pacing leads. This meta-analysis may be a starting point to state the effect of using antibiotic envelops for patients with high power device having risk factor of device infection. Further studies will be needed to certain the relationship between device infection and antibiotic envelops (TYRX) with long-term follow-up period.

CONFLICT OF INTEREST

The author declares no conflict of interests for this article.

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