Timing of Antibiotic Prophylaxis for Preventing Surgical Site Infections in Foot and Ankle Surgery

Presenting Author:
Direk Tantigate, MD

Additional Authors:
Eugene Jang, MD, MS, Mani Seetharaman, MD, MS, Peter C. Noback, BA, Anna M. Heijne, BSc, Justin Greisberg, MD, J Turner Vosseller, MD

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Introduction/Purpose: Surgical site infection (SSI) is one of the most troublesome outcomes after any surgery, for both patient and surgeon. In addition to significant morbidity for patients, SSIs have been hallmarked as an important metric in value-based purchasing by CMS. Surgical literature has suggested that 15-60 minutes prior to incision is the ideal timing of intravenous antibiotics. The purpose of this study is to find the optimal timing of antibiotic administration before foot and ankle surgery, as well as to elucidate the risk factors for SSIs.

Methods: An a priori power analysis was performed in order to detect a 4% absolute increase in infection rate with delayed timing of antibiotic prophylaxis, based on a presumed baseline SSI rate of 4% in foot and ankle surgeries based on literature on healthy patients undergoing foot and ankle surgery (n=1204 to achieve a power of .80). A retrospective chart review of 1933 foot and ankle procedures in 1632 patients over 56 months was performed. Demographic data, type and amount of antibiotics, timing of antibiotic administration, incision time, and closure time were recorded. The incidence of subsequent wound infection and subsequent incision and drainage procedure (I&D) within 30 days and 90 days were documented. Comparison of outcomes and demographic variables between the group of patients who received preoperative antibiotics less than 15 minutes before incision, and those who received them between 15 to 60 minutes prior to incision was performed.

Results: A total of 1569 procedures met inclusion criteria. There were a total 17 cases (1.1%) of subsequent wound infection, of which 11 required a subsequent I&D within 90 days. There were 59 additional cases (3.8%) of wound complications which did not meet SSI criteria. When antibiotics were administered between 15 and 60 minutes prior to incision, there was a 2.7-fold, statistically significant higher rate of SSIs as compared to the group of patients receiving antibiotics < 15 minutes before incision (p < 0.05). When comparing the patients who had subsequent SSIs to those who did
not, the only significant independent predictors were longer surgeries and non-ambulatory surgeries (both $p < 0.05$). When a stepwise multivariate logistic regression was performed to see which variables would predict an SSI, it was found that 91.8% of the risk of an SSI could be predicted by ASA score and length of surgery alone.

**Conclusion:** In foot and ankle surgeries, the timing of intravenous antibiotic prophylaxis does not appear to play as large of a role as in other surgical subspecialties. Our studies revealed that host factors length/complexity of surgery may play a much larger role in determining the rate of infections than the timing of antibiotic prophylaxis.