

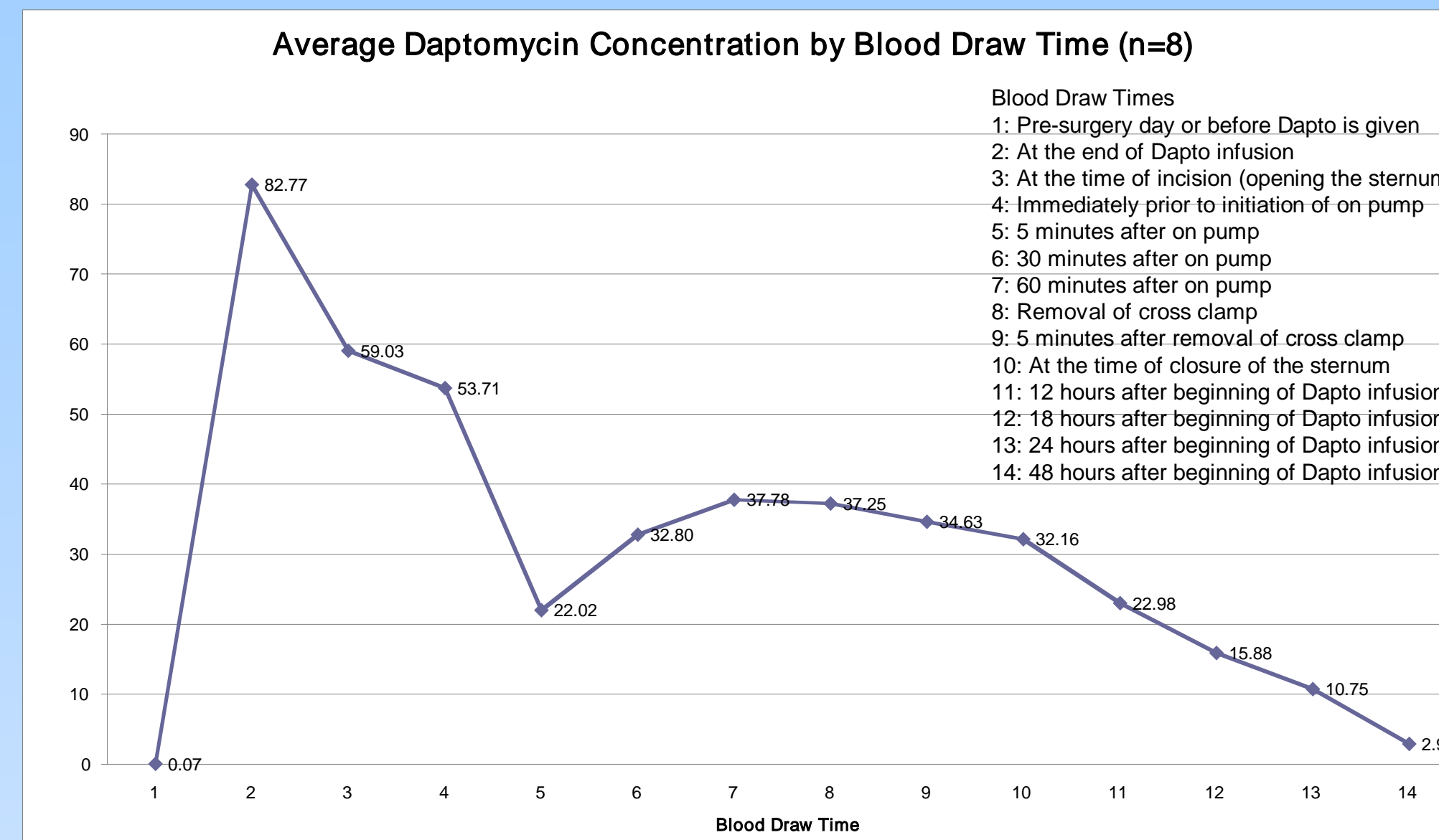
BACKGROUND

- Vancomycin is becoming the standard of care for surgical site infection prophylaxis in cardiothoracic surgery.
- Vancomycin resistance among *S. aureus*, the most common cause of surgical site infection is increasing. Not all patients tolerate vancomycin, and no alternatives are recommended.
- Daptomycin has a long half-life and is effective against pathogens that cause infections in clean surgery such as *S. aureus*.
- Daptomycin holds promise as an alternative to vancomycin for surgical prophylaxis in cardiopulmonary bypass (CPB).

METHODS

- We enrolled hospitalized patients undergoing coronary artery bypass graft surgery.
- Consenting subjects received a single intravenous administration of daptomycin 8mg/kg as surgical antibiotic prophylaxis. Pharmacokinetic and clinical information was collected.
- Total plasma daptomycin concentrations were determined and compared to the minimum inhibitory concentrations (MIC₉₀) of the common pathogens involved in surgical site infections, specifically *Staphylococcus aureus* and *Staphylococcus epidermidis*.
- Muscle weakness, myalgia, and an increase in CPK levels have been reported in patients taking daptomycin.
- The surgical site was assessed daily for one week to identify for any signs and symptoms (e.g. purulent drainage, pain or tenderness, localized redness, swelling or heat) of a surgical site infection.

RESULTS



MIC₉₀ for *S. aureus* is 0.08 µg/mL⁸; MIC₉₀ for *S. epidermidis* is 0.5-4 µg/mL⁸. (MIC = minimum inhibitory concentration).

- Eight patients have been enrolled. Daptomycin concentrations are shown in the figure, above.
- The highest serum concentrations of daptomycin, with a mean of 82.77µg/mL, occurred at the end of daptomycin infusion. The lowest serum daptomycin concentration, with a mean of 2.90µg/mL, occurred at 48 hours after beginning daptomycin infusion.
- All mean daptomycin concentrations except pre-infusion and 48 hours exceed the MIC₉₀ for *S. aureus* and *S. epidermidis*. For cardiothoracic surgery, 24 hours of antibiotics is sufficient for prevention of infection.
- The surgical site in each patient showed no signs or symptoms (e.g. purulent drainage, pain or tenderness, localized redness, swelling or heat) of infection.
- We did find that the CPKs are mildly elevated, but we will compare findings to patients who received standard of care prophylaxis (vancomycin) for comparison as increased CPK may be a result of the surgical procedure itself.

CONCLUSIONS

- Our findings suggest that daptomycin confers adequate prophylaxis against SSIs during CPB procedures, and may be an acceptable alternative to vancomycin for surgical site infection prophylaxis during CPB procedures.
- Given that for cardiothoracic surgery, 24 hours of antibiotics is sufficient for prevention of infection, this indicates that serum daptomycin levels remained well above the MIC₉₀ for *S. aureus* and *S. epidermidis*, the most common pathogens causing surgical site infections.
- Our study is limited as it was not powered to assess efficacy of daptomycin as surgical prophylaxis in cardiopulmonary bypass surgery, however such studies would require very large sample size and expenditures.

IMPLICATIONS

- Additional and larger studies evaluating daptomycin's efficacy at minimizing SSI may be warranted to validate its use as an effective alternative antibiotic for surgical prophylaxis.

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