In the Literature

Staphylococcus lugdunensis


S. lugdunensis, a species of coagulase-negative staphylococci (CoNS), is part of the normal human skin flora and has a predilection for colonizing the perineal area [1]. Although CoNS are ordinarily considered to be of relatively low virulence, this is not true of S. lugdunensis, an organism that was first identified in 1988 in Lyon, the site of the capital of the Roman province of Lugdunum. The virulence of S. lugdunensis more closely resembles that of Staphylococcus aureus than it does other CoNS.

Zinkernagel and colleagues reviewed experiences with 28 patients with S. lugdunensis bacteremia at 3 tertiary care centers in Switzerland during a 10-year period that ended in December 2005. Thirteen patients (46.4%) had endocarditis, and the remainder had bacteremia without endocarditis. All cases of endocarditis were community acquired, whereas 12 of the 15 cases of bacteremia alone were nosocomial in origin. Among patients in the latter group, a probable source of bacteremia was identified in 13 patients (87%), with all but 2 cases involving a vascular catheter or other intravascular device. Seven of 13 patients with endocarditis had septic emboli, and 11 underwent cardiac surgery. Three (23%) of these 13 patients, all of whom had undergone surgery, died; all deaths resulted from complications of endocarditis. Although 2 patients with bacteremia died, neither death was related to the infection.

Twenty-three (82%) of the 28 isolates were susceptible to penicillin, whereas none were resistant to oxacillin—a pattern similar to that usually observed, although oxacillin resistance may occur. Disk susceptibility testing of a collection of 106 isolates from Singapore found that 72.6% were penicillin susceptible, and 95.3% were susceptible to cefoxitin—a more accurate measure of meca-related methicillin resistance than is testing with oxacillin [2]. Low-level oxacillin resistance in S. lugdunensis may, however, occur in the absence of the meca gene. The fact that S. lugdunensis has an oxacillin susceptibility breakpoint that differs from that of other CoNS is a reason (in addition to its relative virulence) why accurate identification by clinical microbiology laboratories is important. Laboratories may, however, have difficulties identifying this organism. For instance, S. lugdunensis may occasionally be misidentified as S. aureus. Although S. lugdunensis is coagulase negative, a membrane-bound form of the enzyme (clumping factor) present in some isolates may lead to a positive result of slide coagulation and/or some rapid latex agglutination tests [1].

References


Dental Bacteremia


The recently published, updated recommendations for antibiotic prophylaxis for the prevention of infective endocarditis after dental procedures represented a major modification of those contained in the previous guidelines [1]. The recommendations were simplified, and the indications for prophylaxis were sharply limited, such that only a relatively small group of individuals considered to be at the highest risk were targeted. An important rationale for this change was an estimate that total bacteremic exposure associated with activities of daily living, such as toothbrushing, far exceeded that resulting from dental procedures. However, this estimate was based on studies that all had important limitations, such as small sample size.

Lockhart and colleagues evaluated the issue of bacteremia after toothbrushing and dental extraction and its prevention with antibiotic prophylaxis. Three hundred ninety subjects were randomized to 1 of 3 groups: those who engaged in toothbrushing alone; those who had a single tooth extracted, with single-dose amoxicillin prophylaxis; and those who had a tooth extracted, with placebo prophylaxis. At least 1 of 6 blood cultures yielded positive results for 32%, 56%, and 80% of subjects, respectively; no baseline (preprocedure) culture result was positive. The highest incidences occurred during the first 5 min of the procedure (blood specimens were obtained at 1.5 and 5.0 min), with positive culture results for 19% of the toothbrushing alone group, 33% of subjects who underwent extraction and received amoxicillin, and 58% of those who underwent extraction and received placebo. There was a marked decrement in the incidence of bacteremia after 20 min, but 5% of persons in the extraction plus placebo group and 2% in the toothbrushing group were still bacteremic at the time of the last phlebotomy, at 60 min. All bacteria loads were less than the level of detection for quantitative PCR (10⁴ CFU/mL). Approximately one-half of the bacteria isolated were streptococci, followed in frequency of detection by Prevotella species (9%), Actinomyces species (5%), and Fusobacterium species (5%). Amoxicillin prophylaxis was associated with a 69% decrease in the incidence of
positive culture results, with the greatest reduction occurring during the first 20 min after the procedure. The incidence of viridans streptococcal bacteremia decreased by 78% with receipt of amoxicillin prophylaxis.

Lockhart and colleagues calculate, on the basis of these results, that an individual who brushed their teeth twice daily would experience at least 200 associated episodes of bacteremia in a year. A single extraction in that same year would be associated with a 58% chance of bacteremia without amoxicillin prophylaxis and 33% with prophylaxis. Thus, toothbrushing represents by far the greater likelihood of causing bacteremia when compared to the yearly exposure from dental extractions and strongly support the current recommendations for only very limited use of antibiotic prophylaxis in individuals undergoing dental procedures. In fact, one could question the rationale for routine dental prophylaxis even in the small group for whom it is currently recommended.

Reference

The Right Time for Surgical Antibiotic Prophylaxis

Criteria used by the Surgical Care Improvement Project require that antibiotic prophylaxis be administered within 60 min before surgical incision. The optimal timing during that 1-h window is, however, uncertain. In a prospective, observational cohort study, Weber and colleagues evaluated the relationship of the timing of antibiotic prophylaxis with the incidence of surgical site infection (SSI) after 3386 surgical procedures. Patients received a single 1.5-g intravenous dose of cefuroxime; patients who were undergoing colorectal surgery also received a dose of metronidazole (500 mg).

Surgery involved clean wounds in 71.8% of patients, clean-contaminated wounds in 17.2%, and contaminated wounds in 10.9%. SSI developed in 180 (4.7%) of 3836 patients; 30.6% of SSIs were superficial, 29.4% were deep, and 40% were classified as an organ-space SSI. The OR for development of an SSI was significantly higher if prophylaxis was administered <30 min before the procedure (49% of patients received their dose during that time window) and if it was administered 120 to 60 min before the procedure, compared with administration 59 to 30 min before incision. The overall lowest risk of SSI occurred when the antibiotic was administered between 74 and 30 min before incision.

Thus, the time at which antibiotic prophylaxis is administered, even within the recommended 60-min time frame, appears to be of importance, and contrary to common practice, administration within the last 30 min immediately before incision is not optimal. In an accompanying commentary, Dellinger [1] points out that other studies have found disparate results and that consideration must also be given to additional factors, such as tourniquet inflation in patients undergoing limb surgery. Furthermore, tight timing of antibiotic prophylaxis is difficult to accomplish in fast-moving US surgical units (the study described here was performed in Basel, Switzerland). In addition, the application of these results to antibiotics with longer serum half-lives and administration requirements can be questioned. Of note, however, is that a study that evaluated vancomycin prophylaxis in persons undergoing cardiac surgery found that this long-half-life antibiotic, which must be administered over a 60-min period, is optimally administered beginning 15–60 min before incision [2].

References