All Surgical Site Infections Are Not Equal

To the Editor

The recent editorial1 highlighting the article by Belani et al.2 promoted an important misconception that all surgical site infections (SSI) are created equal. Assuming that all SSIs are the same leads to the erroneous conclusion that the often-referenced study by Kurz et al.,3 that showed that soft tissue SSIs during colon surgery are decreased by forced-air warming, also applies to infections involving implanted foreign materials such as periprosthetic joint infections (PJI) after total joint replacement surgery. The implantation of foreign material in the body fundamentally changes the pathophysiology of the infectious process. An inoculum of >1 million bacteria is required to cause a soft tissue SSI, and the bacteria usually enter the wound from the adjacent skin or cut bowel.4 The infection usually manifests within days and is easily treatable. In sharp contrast, it has been shown that a single bacterium can cause a PJI, and it usually enters the wound as airborne contamination.5,6 The infection may take up to a year to manifest and is generally catastrophic. The primary difference between the two is the ability of bacteria to form a biofilm protective coating in the presence of implanted foreign materials but not in soft tissue. Therefore, the results of the Kurz study4 cannot be applied to PJIs.

Conflicts of Interest: Scott Augustine, MD, is the CEO and an investor in ATM, manufacturer of HotDog® patient warming.

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REFERENCES

3. Kurz A, Sessler DI, Lenhardt R. Perioperative normothermia to prevent contamination.5 However, even suture material, polyfilament more than monofilament, can be a nidus for infection6,7 as can mesh used for a hernia repair.8 In fact, under experimental conditions, bacterial adherence was seen with an inoculum of <10 bacteria.9 Therefore, future studies of the aerosols caused by forced-air warmers should include examination of the potential inoculum carried by these aerosols as well as whether they can actually cause infections. Without such information, it is impossible to evaluate the advantages or disadvantages of forced-air warming from the viewpoint of infective potential.

As Augustine4 points out, the infective potential of a bacterial inoculum is dependent on the material inoculated. Living tissue requires a larger inoculum than prosthetic material to become infected. A joint prosthesis, such as a hip or knee replacement, is especially vulnerable to a small inoculum and thus the precautions taken to prevent contamination.6 However, even suture material, polyfilament more than monofilament, can be a nidus for infection6,7 as can mesh used for a hernia repair.8 In fact, under experimental conditions, bacterial adherence was seen with an inoculum of <10 bacteria.9 Therefore, future studies of the aerosols caused by forced-air warmers should include examination of the potential inoculum carried by these aerosols as well as whether they can actually cause infections. Without such information, it is impossible to evaluate the advantages or disadvantages of forced-air warming from the viewpoint of infective potential.

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REFERENCES

4. Augustine S: All surgical site infections are not equal. Anesth Analg 2014;118:883