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QUESTION 3: Do antibacterial-coated sutures reduce the risk of subsequent surgical site infection/periprosthetic joint infection (SSI/PJI)?

RECOMMENDATION: The use of antibacterial-coated sutures reduces the risk of SSI following colorectal surgery, however, there is no conclusive evidence that its use reduces the risk of subsequent SSI/PJI in orthopaedic patient populations.

LEVEL OF EVIDENCE: Limited

DELEGATE VOTE: Agree: 92%, Disagree: 3%, Abstain: 5% (Super Majority, Strong Consensus)

RATIONALE

The risk factors for SSI are multifactorial [1]. The presence of suture material, considered a prosthetic implant, logarithmically reduces the number of organisms needed for SSI from 10^5 to 10^2 colony-forming units and therefore increases the rate of a SSI [2]. Triclosan, a broad-spectrum antibacterial agent against gram-positive and gram-negative bacteria, has been effectively used in suture material since 2003 to reduce SSI [3,4]. Triclosan-coated sutures (TCS) can create an "active zone" around the suture, inhibiting *Staphylococcus aureus*, *Staphylococcus epidermidis* and methicillin-resistant strains of Staphylococci (MRSA and MRSE), *Escherichia coli* and *Klebsiella pneumoniae* from colonizing on the suture for a minimum of 48 hours in in vitro studies [5,6].

TCS have been reported to reduce SSI in many surgical disciplines. In a randomized controlled trial of colorectal surgery, the use of TCS had a significantly lower incidence of wound infection compared with the use of non-antimicrobial sutures (4.3% vs.9.3%) [7]. In a meta-analysis with level I evidence, no publication bias and a robust sensitivity analysis, the use of TCS provided a reduction of approximately 30% in a population of 5,000 patients after various clean, clean-contaminated and contaminated surgeries [8]. A recent systematic review and meta-analysis included 21 RCTs (6,462 patients) with various surgery types (colorectal, head and neck, abdominal, cardiac and vascular and general surgery) and showed SSIs were reduced significantly by the use of TCS compared with uncoated sutures (relative risk (RR): 0.72, 95% confidence interval (CI) 0.60 to 0.86, $p < 0.001$) [9].

Current clinical guidelines have contradictory suggestions for TCS. The World Health Organization (WHO) [10] and The National Institute for Health and Care Excellence (NICE) [11] support the use of TCS for the risk reduction of SSI. The Infectious Diseases Society of America (IDSA) [12] and The Society for Healthcare Epidemiology of America (SHEA) [13] are against its routine use. The recent Centers for Disease Control and Prevention (CDC) guideline supports consideration of TCS use for the prevention of SSI, balancing clinical benefit and harm [14].

There is little evidence assessing the efficacy of TCS on SSI following total joint arthroplasty (TJA). To our knowledge there has been 1 prospective study involving 2,546 patients undergoing elective TJAs at 3 hospitals [15]. A total of 1,323 patients were randomized to a standard suture group, and 1,223 to the TCS group with SSI at 30 days postoperatively as a primary end-point. Sprowson et al. reported that the rates of superficial SSI were 0.8% in the control group and 0.7% in the TCS group ($p = 0.651$). The rates of deep SSIs were 1.6% in the control group and 1.1% in the TCS group ($p = 0.300$). The rates of deep and superficial SSIs were 2.5% in the control group and 1.8% in the TCS group ($p = 0.266$).

Based on the above level I studies on various types of surgeries and surgical wounds, the use of TCS seems to reduce the rate of SSI.

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