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CORR Insights®: Is Vancomycin-only Prophylaxis for Patients With Penicillin Allergy Associated With Increased Risk of Infection After Arthroplasty?

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Where Are We Now?

Deep prosthetic joint infections (PJI) following total joint arthroplasty (TJA) can be catastrophic. Timely administration of intravenous antibiotics prior to sur-

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gical incision is one of the most effective strategies to prevention of postoperative infections [6]. Currently, first- or second-generation cephalosporins are recommended for prophylaxis prior to routine THA and TKA [1]. However, in recent years, changes in patient demographics and increasing prevalence of resistant organisms in patients undergoing lower-extremity arthroplasty have raised the question of whether current recommendations are adequate. Combination therapies including the routine addition of vancomycin to the prophylactic antimicrobial regimen have shown only comparable efficacy to monotherapy in some studies, while increasing the risk of acute kidney injury in others [3, 8]. Furthermore, decolonization protocols have also been shown to be variable in terms of compliance and efficacy [10].

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Therefore, the question remains: What is the correct approach to antibiotic prophylaxis prior to hip or knee replacement?

In this article, Tan et al. present an interesting study on the use of vancomycin alone for prophylaxis in patients with penicillin allergies undergoing TJA. The authors found that administration of vancomycin alone did not increase the rate of deep surgical site infections, but decreased the risk for infections with Gram-positive organisms and antibiotic resistant organisms.

Where Do We Need To Go?

This work adds valuable information, but a number of questions remain. It would be important to validate these findings in other centers, and in prospective studies that permit tighter standardization of clinical practices. Of course, the endpoint we are most interested in—deep infection—requires much larger (and almost certainly multicenter) studies.

The allure of widespread utilization of vancomycin as an effective agent to prevent infections with resistant organisms

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must be tempered by the potential risks, including renal toxicity, ototoxicity, and antimicrobial resistance. However, this is a common clinical scenario that not only affects arthroplasty surgeons, but all orthopaedic surgeons. Even though cross-reactivity and true anaphylaxis resulting from cephalosporin administration is only approximately 10% [2], most surgeons opt for antibiotic alternatives rather than “test-dosing” the patient under anesthesia to determine the presence or absence of true allergy. Vancomycin and clindamycin are commonly used alternatives in these situations, but concerns remain with regards to the efficacy of clindamycin and coverage of vancomycin as stand-alone agents [9]. Other studies have shown an increased risk of infections when only vancomycin is administered for routine prophylaxis [7]. Consequently, larger, prospective studies taking into account host factors, local antibiograms, and clinical practices such as decolonization protocols will be needed to definitively define the indications and efficacy for various antibiotic prophylactic protocols surrounding TJA.

How Do We Get There?

Many factors contribute to the risk of surgical site infections, and so to study the impact of antibiotics on infection properly, a multidisciplinary approach is called for. First, standardization of

definitions and clinical practices will allow us to collaborate to find an answer to this problem without introducing confounding variables and bias. Today, there are established criteria for the work-up and diagnosis for infected TJA as well as clinical practice guidelines for the management of the infected TJA [5]. Second, a creation and contribution of surgical site infection and PJI data to various local and national registries will allow surveillance at a population level and the development of protocols based on specific antibiograms. Finally, and perhaps most challenging, is the need to define the “optimized” candidate for joint arthroplasty. Conditions such as diabetes, chronic kidney disease, obesity, and malnutrition have been shown to place patients at increased risk for development of infections postoperatively [4]. We need more studies that specifically ascertain at what point we should consider those sorts of conditions “well enough” managed that it is clinically reasonable to proceed with elective arthroplasty. Because of the increased risk, those studies also should help us to determine whether these higher-risk patients should be treated with different antibiotic approaches than low-risk patients?

Identifying the correct antibiotic prophylaxis protocols can have profound and wide-reaching impact. The cost to prevent a single patient’s

infection must be counterbalanced against the risks in that patient of adverse effects, but also against societal costs, such as the development of antibiotic-resistant organisms. Orthopaedic surgeons, will be at the forefront of this dilemma and must play a part in practicing good, evidence-based, antibiotic stewardship.

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