

Preoperative Asymptomatic Bacteriuria and Subsequent Prosthetic Joint Infection: Lack of a Causal Relation

TO THE EDITOR—We read with great interest the paper of Sousa et al claiming that asymptomatic bacteriuria (ASB) is a risk factor for prosthetic joint infection (PJI) [1]. We congratulate the authors for this important multicenter study [1] and Dr Duncan for the accompanying editorial that highlights the key limitations of the study [2]. The administration of antibiotics for ASB before elective arthroplasty is controversial, but reflects widespread practice and likely represents a common reason for antibiotic misuse in many centers. A survey in the United Kingdom revealed that two-thirds of surgeons would treat ASB prior to knee arthroplasty, but 70% would not have any evidence to cite evidence in favor of this practice [3]. Unfortunately, most studies are retrospective single-center studies that do not differentiate between symptomatic infection and ASB and fail to take into account costs or unintended consequences of unnecessary antibiotic use [4]. A large prospective multicenter study on this topic is thus warmly welcome [1].

However, the interpretation of the results regarding preoperative ASB and subsequent PJI should be as cautious as possible. As the editorialist points out [2], this study only establishes an epidemiological association between ASB and development of a PJI of a nonurinary origin. Importantly, treatment of ASB was not associated with a reduced risk of PJI. This is hardly surprising, as the pathogens of the PJI were different from the pathogens of the ASB episode in all except 1 case. Furthermore, the reported association was based on 41 cases of PJI, which is a relatively small number. The use of a multivariable regression analysis with variable selection based on *P* values from the univariable analysis is also debatable, and led to the exclusion of obesity, a well-known risk factor for PJI, which was substantially more prevalent in the ASB group. Finally, we are surprised that the article lacks detailed information about postoperative urinary catheter use [5], which is a known risk factor for symptomatic urinary tract infection. The finding that patients with ASB harbor an overall infection risk of 4.3%, even though late-onset hematogenous infections would have been reasonably excluded [6], seems noteworthy and would have merited further discussion. In the current literature, the benchmark for elective arthroplasty infections oscillates between 0.5% and 1.5% for primary arthroplasties [7, 8] (3%–4% for revision arthroplasties) during a surveillance period of 2 years, which, it should be noted, is twice the follow-up time in this study.

In summary, we feel that the wording “asymptomatic bacteriuria is an independent risk factor for prosthetic joint infection” [1] is somewhat unfortunate as it could easily be misinterpreted, especially by time-pressured clinicians, who often only rapidly skim abstracts and usually skip editorials altogether. A formulation such as “ASB was associated with a subsequent PJI of a nonurinary origin” may have been more appropriate.

We fear that certain surgeons, especially if they skip the editorial [2], may feel obliged to treat ASB before elective arthroplasty based on this report. Although this was certainly not the intention of the authors, their article may thus counterbalance antibiotic stewardship efforts.

Note

Potential conflicts of interest. All authors: No reported conflicts.

All authors have submitted the ICMJE Form for Disclosure of Potential Conflicts of Interest. Conflicts that the editors consider relevant to the content of the manuscript have been disclosed.

Ilker Uçkay,^{1,2,3} Anne Lübbeke,¹ and Benedikt Huttner^{2,3}

¹Orthopaedic Surgery Service, ²Service of Infectious Diseases, and ³Infection Control Program, Geneva University Hospitals and Faculty of Medicine, Geneva, Switzerland

References

1. Sousa R, Muñoz-Mahamud E, Quayle J, et al. Is asymptomatic bacteriuria a risk factor for prosthetic joint infection? *Clin Infect Dis* **2014**; 59:41–7.
2. Duncan RA. Prosthetic joint replacement—should orthopedists check urine because it's there? *Clin Infect Dis* **2014**; 59:48–50.
3. Finnigan TKP, Bhutta MA, Shepard GJ. Asymptomatic bacteriuria prior to arthroplasty: how do you treat yours? *J Bone Joint Surg Br* **2012**; 94:23–9.
4. Bouvet C, Lübbeke A, Bandi C, et al. Is there any benefit in pre-operative urinary analysis before elective total joint replacement? *Bone Joint J* **2014**; 96-B:390–4.
5. Stephan F, Sax H, Wachsmuth M, et al. Reduction of urinary tract infection and antibiotic use after surgery: a controlled, prospective, before-after intervention study. *Clin Infect Dis* **2006**; 42:1544–51.
6. Uçkay I, Lübbeke A, Emonet S, et al. Low incidence of haematogenous seeding to total hip and knee prostheses in patients with remote infections. *J Infect* **2009**; 59:337–45.
7. Lübbeke A, Garavaglia G, Barea C, et al. Why do we need hospital-based registries? The Geneva Hip Arthroplasty Registry. Zurich: EFORT Publications, **2010**.
8. Uçkay I, Hoffmeyer P, Lew D, et al. Prevention of surgical site infections in orthopaedic surgery and bone trauma: state-of-the-art update. *J Hosp Infect* **2012**; 84:5–12.

Correspondence: Ilker Uçkay, Attending MD, Geneva University Hospitals and Faculty of Medicine, 4 Rue Gabrielle Perret-Gentil, 1211 Geneva 14, Switzerland (ilker.uckay@hcuge.ch).