year, and Charlson comorbidity score are independent prognostic factors affecting the risk of hospitalization [7]. In particular, they demonstrated that men with prostate enlargement and diabetes had an increased risk of developing febrile complications due to urinary tract infections after prostate biopsy.

In a recent paper, the same authors found that later year of biopsy was the only factor significantly associated with an increased risk of hospital admission [8]. This aspect could be related to the different number of biopsy cores performed. Even if it seems unclear whether the rates of infectious complications would be different with a greater number of biopsy cores, a previously reported randomised trial of 6 versus 12 core biopsies reported no significant differences in terms of febrile complications [9]. However, Wagenlehner et al. reported the number of biopsy cores as the only significant risk factor between symptomatic and asymptomatic urinary tract infections after prostate biopsy [4]. These data were also recently confirmed by Dodds et al. They found an increased rate of complications after prostate biopsy in a cohort of 2080 consecutive patients from 2003 to 2010, pinpointing the number of biopsy cores as one of the main causes of patients' hospitalization [10].

In conclusion, prostate biopsy should have a standard of care with precise recommendations for both the first instance biopsy and the rebiopsy, also considering the potential role of new markers and patient's age for patient selection. The use of a standard of care could reduce the risk of unnecessary biopsies, improve the cost–benefit ratio, and lower the risk of developing complications after biopsy.

Conflicts of interest: The authors have nothing to disclose.

References

[1] Chun FK-H, Epstein JI, Ficarra V, et al. Optimizing performance and interpretation of prostate biopsy: a critical analysis of the literature. Eur Urol 2010;58:851–64.

[2] Heidenreich A, Bastian PJ, Bellmunt J, et al. Guidelines on prostate cancer diagnosis. European Association of Urology Web site. http://www.uroweb.org/gls/pdf/08%20Prostate%20Cancer_LR%20March%2013th%202012.pdf. Updated 2012.

[3] Nam RK, Saskin R, Lee Y, et al. Increasing hospital admission rates for urological complications after transrectal ultrasound guided prostate biopsy. J Urol 2010;183:963–8.

[4] Wagenlehner FME, Van Oostrum E, Tenke P, et al. Infective complications after prostate biopsy: outcome of the Global Prevalence Study of Infection in Urology (GPIU) 2010 and 2011, a prospective multinational multicentre prostate biopsy study. Eur Urol 2013;63:521–7.

[5] Taylor HM, Bingham JB. The use of prophylactic antibiotics in ultrasound guided transrectal prostate biopsy. Clin Radiol 1997;52:787–90.

[6] Taylor AK, Zembower TR, Nadler RB, et al. Targeted antimicrobial prophylaxis using rectal swab cultures in men undergoing transrectal ultrasound guided prostate biopsy is associated with reduced incidence of postoperative infectious complications and cost of care. J Urol 2012;187:1275–9.

[7] Loeb S, Carter HB, Berndt SI, et al. Complications after prostate biopsy: data from SEER-Medicare. J Urol 2011;186:1830–4.

[8] Loeb S, van den Heuvel S, Zhu X, et al. Infectious complications and hospital admissions after prostate biopsy in a European randomized trial. Eur Urol 2012;61:1110–4.

[9] Naughton CK, Ornstein DK, Smith DS, et al. Pain and morbidity of transrectal ultrasound guided prostate biopsy: a prospective randomized trial of 6 versus 12 cores. J Urol 2000;163:168–71.

[10] Dodds PR, Boucher JD, Shield DE, et al. Are complications of transrectal ultrasound-guided biopsies of the prostate gland increasing? Conn Med 2011;75:453–7.

http://dx.doi.org/10.1016/j.eururo.2012.06.050

Platinum Priority

Reply from Authors re: Riccardo Bartoletti, Tommaso Cai. Prostate Biopsies Should Be Performed According to a Standard of Care. Eur Urol 2013;63:528–9

Florian Wagenlehner[a,*], Edgar van Oostrum[b], Peter Tenke[c], Zafer Tandogdu[d], Mete Çek[e], Magnus Grabe[f], Björn Wullt[g], Robert Pickard[h], Kurt G. Naber[i], Adrian Pilatz[a], Wolfgang Weidner[a], Truls E. Bjerklund-Johansen[j]

[a] *Department of Urology, Pediatric Urology and Andrology, Justus-Liebig-University, Giessen, Germany;* [b] *Information Technology Department, European Association of Urology, Arnhem, The Netherlands;* [c] *Department of Urology, Jahn Ferenc South-Pest Hospital, Budapest, Hungary;* [d] *Department of Urology, Taksim Teaching Hospital, Istanbul, Turkey;* [e] *Department of Urology, Trakya University, Edirne, Turkey;* [f] *Department of Urology, Skåne University Hospital, Malmö, Sweden;* [g] *Department of Microbiology, Immunology and Glycobiology, Lund University, Lund, Sweden;* [h] *Institute of Cellular Medicine, Newcastle University, Newcastle upon Tyne, UK;* [i] *Technical University of Munich, Munich, Germany;* [j] *Department of Urology, Aarhus University Hospital, Aarhus, Denmark*

We thank the editors for the opportunity to respond to the editorial comments presented by Bartoletti and Cai [1]. We agree with the authors' idea to standardize indications for and performance of prostate biopsies. As noted in our paper, prostate biopsy is a procedure performed worldwide [2] and is currently the only way of directing patients to prostate cancer treatment. The possible benefit of prostate cancer screening was demonstrated in the recently updated European Randomized Study of Screening for Prostate Cancer, which, after a median follow-up of 11 yr, reported

DOIs of original articles: http://dx.doi.org/10.1016/j.eururo.2012.06.003, http://dx.doi.org/10.1016/j.eururo.2012.06.050.

* Corresponding author. Department of Urology, Pediatric Urology and Andrology, Justus-Liebig-University, Giessen, Rudolf-Buchheim-Str. 7, 35385 Giessen, Germany. Tel. +49 641 98544516; Fax: +49 641 98544509. E-mail address: Wagenlehner@aol.com (F. Wagenlehner).

an absolute reduction in mortality in the screening group of 0.10 deaths per 1000 person-years or 1.07 deaths per 1000 men who underwent randomization [3]. This finding is likely to increase demand for prostatic biopsy and urologists must ensure that infection complications of biopsy do not outweigh the survival advantage of early detection and treatment.

Radical prostatectomy is a well-performed and safe procedure [4]; however, there exists a realistic threat that this benefit will be lost when the complication of infection increases due to antibiotic resistance [5]. Therefore, standardized criteria for indication of prostate biopsies should be used worldwide. The German interdisciplinary guideline on the management of prostate carcinoma [6] states that if the patient undergoes testing for early detection of prostate cancer, prostate biopsy can be recommended if at least one of the following criteria is present:

- A controlled prostate-specific antigen (PSA) value of $\geq$4 ng/ml, but also considering possible influencing factors;
- Suspicion of carcinoma after rectal digital examination;
- Suspicious PSA increase in the same test system.

The European Association of Urology guidelines on prostate cancer also state that the need for prostate biopsies should be determined on the basis of the PSA level and/or a suspicious digital rectal examination [7], also considering the patient's biological age, potential comorbidities, and therapeutic consequences. It is also explicitly stated that the first elevated PSA level should not prompt an immediate biopsy; rather, the PSA level should be verified after a few weeks by the same assay under standardized conditions in the same diagnostic laboratory using the same methods [7]. Following these guidelines, unnecessary biopsies could be prevented.

If the right patient for prostate biopsy has been selected, performance algorithms of biopsy should also be reconsidered. Patients at risk of developing complications from infection, therefore, should be able to be identified. In our paper, we were not able to define significant risk factors for increasing infection complications. The number of biopsy cores did inversely correlate with increased infection complications and, therefore, is not a risk factor per se. Other studies were able to define possible risk factors, such as diabetes or prostate gland size [8]. These factors are, however, most probably only secondary risk factors.

The most important aspect driving the increase of complications from infection after prostate biopsy is antimicrobial resistance, especially to the current first-line recommended fluoroquinolone antibiotics. In this respect, Bartoletti and Cai [1] have alluded to one further study evaluating targeted antimicrobial prophylaxis in men undergoing transrectal ultrasound (TRUS)–guided prostate biopsy based on rectal swab culture results [9]. Apart from decreasing the incidence of infection complications after TRUS-guided prostate biopsy caused by fluoroquinolone-resistant organisms, targeted antimicrobial prophylaxis was also associated with a decrease in the overall cost of care. This is a very important aspect that has to be stressed: Improved or increased diagnosis of microbial pathogens, if indicated, not only may be able to improve patient care, but can also help save money.

One important future goal to improve safety in transrectal prostate biopsies will be the evaluation in suitable clinical trials of alternative antimicrobial substances exhibiting appropriate pharmacokinetic parameters and to which pathogens react with sufficient susceptibility, as well as evaluation of nonantibiotic measures to be used for prophylaxis.

Conflicts of interest: The authors have nothing to disclose.

References

[1] Bartoletti R, Cai T. Prostate biopsies should be performed according to a standard of care. Eur Urol 2013;63:528–9.
[2] Wagenlehner FME, van Oostrum E, Tenke P, et al., on behalf of the GPIU investigators. Infective complications after prostate biopsy: outcome of the Global Prevalence study of Infections in Urology (GPIU) 2010 and 2011, a prospective multinational multicentre prostate biopsy study. Eur Urol 2013;63:521–7.
[3] Schroder FH, Hugosson J, Roobol MJ, et al. Prostate-cancer mortality at 11 years of follow-up. N Engl J Med 2012;366:981–90.
[4] Kowalczyk KJ, Levy JM, Caplan CF, et al. Temporal national trends of minimally invasive and retropubic radical prostatectomy outcomes from 2003 to 2007: results from the 100% Medicare sample. Eur Urol 2012;61:803–9.
[5] Steensels D, Slabbaert K, De Wever L, Vermeersch P, Van Poppel H, Verhaegen J. Fluoroquinolone-resistant *E. coli* in intestinal flora of patients undergoing transrectal ultrasound-guided prostate biopsy—should we reassess our practices for antibiotic prophylaxis? Clin Microbiol Infect 2012;18:575–81.
[6] Wirth M, Alberti W, Albrecht C, et al. Interdisziplinäre Leitlinie der Qualität S3 zur Früherkennung, Diagnose und Therapie der verschiedenen Stadien des Prostatakarzinoms. AWMF Registernummer 043-022OL, v.2.0–1. Aktualisierung 2011.
[7] Heidenreich A, Bastian PJ, Bellmunt J, et al. Guidelines on prostate cancer. European Association of Urology Web site. http://www.uroweb.org/gls/pdf/08%20Prostate%20Cancer_LR%20March%2013th%202012.pdf. Updated 2012.
[8] Loeb S, van den Heuvel S, Zhu X, Bangma CH, Schroder FH, Roobol MJ. Infectious complications and hospital admissions after prostate biopsy in a European randomized trial. Eur Urol 2012;61:1110–4.
[9] Taylor AK, Zembower TR, Nadler RB, et al. Targeted antimicrobial prophylaxis using rectal swab cultures in men undergoing transrectal ultrasound guided prostate biopsy is associated with reduced incidence of postoperative infectious complications and cost of care. J Urol 2012;187:1275–9.

http://dx.doi.org/10.1016/j.eururo.2012.07.037