Asian Journal of Andrology (2016) 18, 952

www.asiaandro.com; www.ajandrology.com

Open Access

INVITED COMMENTARY

Prostate Cancer

Risk-prediction tools in prostate cancer: the challenge of tailoring

Alessandro Morlacco[1], Jiahua Pan[2], R Jeffrey Karnes[1]

Asian Journal of Andrology (2016) **18**, 952; doi: 10.4103/1008-682X.179526; published online: 20 May 2016

In *Asian Journal of Andrology*, Wu *et al.*[1] propose a prostate cancer (PCa) risk-calculating tool (Huashan Risk Calculator), tailored to the Chinese population in a typical third-level referral center. The key message of the study is clear: the new calculator can outperform a contemporary tool (the Prostate Cancer Prevention Trial - PCPT[2]) in a clinically-based Chinese population. The aim of this work is not without interest: the actual clinical role of PCa risk-predicting systems in large populations is a matter of debate, and the role of race and ethnicity in their diagnostic performance is largely unknown. A recent meta-analysis[3] identified more than 127 models, but only 6 met the minimum criteria for inclusion, and the final results showed that risk-calculating tools improve the clinical accuracy of PSA alone, although with different area under the curve (AUC) values. Of importance, no study directly considers the ability of the models to distinguish between clinically significant and nonsignificant PCa. The chinese population is particularly exposed to these new challenges and controversies: the incidence of prostate cancer in China, although historically lower than in Western countries, is now raising rapidly, as showed by recent epidemiological studies.[4,5] Genetic factors, PSA screening in Europe and North America, and uneven access to care are just a few of the factors accounting for differences among various PCa populations around the word. Almost all PCa risk-calculating tools, in fact, have been developed and validated in Western countries (mainly Europe and the USA), and their extension to a completely distinct population, like the Chinese one, is not obvious. In fact, in a 2012 study published in this Journal, Zhu *et al.*[6] validated some well-known calculators (PCPT[2] and European Randomized Study of Screening for Prostate Cancer - ERSPC[7]) in a contemporary Chinese cohort, showing a better performance for ERSPC over PCPT, but a significant overestimation risk for both.

The authors' efforts must be acknowledged: they analyzed two big biopsy populations (1059 patients in the development phase and 828 men in the validation study) in a single center, building a tool based on simple information with an easy applicability to clinical practice. The use of real-life groups from a single center is the main strength of this study, but also the source of some aspects needing further refinements.

The current study's Chinese male cohort is heterogeneous. Some are asymptomatic with elevated PSAs and/or abnormal DREs and more similar to a Western cohort. On the other hand, some were symptomatic with LUTS and other genitourinary complaints. Moreover perhaps, this heterogeneity could be at least partially responsible for some of its accuracy, even in the same ethnic and clinical context; thus, external validation of this model is warranted to corroborate its applicability to screening or early diagnosis practice. Furthermore, study subjects underwent transrectal prostate ultrasonography (TRUS); although, it is common in China because of low-cost and wide diffusion, an added benefit of this to screening or an earlier diagnosis of an aggressive prostate cancer is widely debated. We recognize that practices vary according to various factors along with patient and provider preferences. However, we should not forget that the use of TRUS in the initial evaluation of all patients specifically the asymptomatic ones is not recommended by most international guidelines.

Another limitation is the lack of comparison between the new tool and others available; for instance, in the cited validation study,[6] the ERSPC calculator slightly outperformed the PCPT one (AUC of 0.831 *vs* 0.852) and might therefore be considered the tool to beat. Another advantage of the ERSPC tool is that it does not require any information on family history, which can be difficult to obtain in the Chinese population. These aspects could certainly be addressed in future studies.

Population-tailored risk calculators, although in their relative infancy, are promising tools to improve on PCa detection. The future will see newer applied bioinformatics algorithms with recalibration capabilities to these populations that should continue to enhance our ability to improve the accuracy of risk calculators.[8] Ultimately, the decision to pursue an early diagnosis of PCa should involve an individualized discussion with the patient and an informed, shared decision-making process despite our ability to use various risk prediction tools. The current authors are to be congratulated in further studying "risk-prediction" in a predominant at risk Chinese population.

COMPETING INTERESTS

The authors declare no competing interests.

REFERENCES

1 Wu YS, Zhang N, Liu SH, Xu JF, Tong SJ, *et al*. The Huashan risk calculators performed better in prediction of prostate cancer in Chinese population: a training study followed by a validation study. *Asian J Androl* 2016; Doi: 10.4103/1008-682X.181192.
2 Thompson IM, Ankerst DP, Chi C, Goodman PJ, Tangen CM, *et al*. Assessing prostate cancer risk: results from the Prostate Cancer Prevention Trial. *J Natl Cancer Inst* 2006; 98: 529–34.
3 Louie KS, Seigneurin A, Cathcart P, Sasieni P. Do prostate cancer risk models improve the predictive accuracy of PSA screening? A meta-analysis. *Ann Oncol* 2015; 26: 848–64.
4 Qi D, Wu C, Liu F, Gu K, Shi Z, *et al*. Trends of prostate cancer incidence and mortality in Shanghai, China from 1973 to 2009. *Prostate* 2015; 75: 1662–8.
5 Chen W, Zheng R, Zeng H, Zhang S. The updated incidences and mortalities of major cancers in China, 2011. *Chin J Cancer* 2015; 34: 53.
6 Zhu Y, Wang JY, Shen YJ, Dai B, Ma CG, *et al*. External validation of the Prostate Cancer Prevention Trial and the European randomized study of screening for prostate cancer risk calculators in a Chinese cohort. *Asian J Androl* 2012; 14: 738–44.
7 ERSPC Online Calculator. Available from: http://www.prostatecancer-riskcalculator.com/.
8 Strobl AN, Vickers AJ, Van Calster B, Steyerberg E, Leach RJ, *et al*. Improving patient prostate cancer risk assessment: moving from static, globally-applied to dynamic, practice-specific cancer risk calculators. *J Biomed Inform* 2015; 56: 87–93.

[1]Department of Urology, Mayo Clinic, Rochester, MN, USA; [2]Department of Urology, Renji Hospital, Shanghai, China.
Correspondence: Dr. RJ Karnes (karnes.r@mayo.edu)